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SITE INSPECTION REPORT FOR MUNITIONS REPOSNE PROGRAM MEC AND MC SITE INSPECTIONS AT TEN MUNITIONS RESPONSE RANGES VOLUMES 1 AND 2 STUMP NECK ANNEX NSWC INDIAH HEAD MD
9/1/2010
TETRA TECH

Site Inspection Report
for
Munitions Response Program
MEC and MC Site Inspections at
Ten Munitions Response Ranges

Volume I of II - Sections 1 through 6

Naval Support Facility
Indian Head - Stump Neck Annex
Indian Head, Maryland

Naval Facilities Engineering Command
Washington

Contract Number N62467-04-D-0055
Contract Task Order 423

September 2010

SITE INSPECTION REPORT
FOR
MUNITIONS RESPONSE PROGRAM
MEC SITE INSPECTIONS AT
TEN MUNITIONS RANGES

Naval Support Facility
Indian Head-Stump Neck Annex
Indian Head, Maryland

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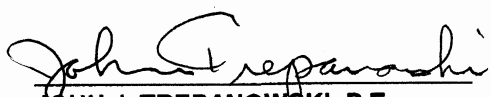

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ACRONYMS AND ABBREVIATIONS

AA&D	Advances Access and Disablement
ALSI	Analytical Laboratory Services, Inc.
AR	Administrative Record
BAF	Bioaccumulation factor
BFB	Bromofluorobenzene
bgs	Below ground surface
BEHP	Bis 2-(ethylhexyl)phthalate
BERA	Baseline ecological risk assessment
BSAF	Biota-sediment bioaccumulation factor
BTAG	Biology Technical Assistance Group
CA	Corrective Action
CAS	Chemical Abstract Service
CATEX	Categorical exclusion
CCB	Continuing Calibration Blank
CCME	Canadian Council of Ministers of the Environment
CCV	Continuing Calibration Verification
CD	Compact Disk
CDI	Chronic Daily Intake
CEC	Cation Exchange Capacity
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHSO	Company Health and Safety Officer
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Chain of Custody
COPC	Chemical of Potential Concern
CPR	Cardiopulmonary resuscitation
CRDL	Contract Required Detection Limit
CSM	Conceptual Site Model
CTO	Contract Task Order
CWAP	Comprehensive Work Approval Process
CWM	Chemical warfare material
DAF	Dilution attenuation factor
DERP	Defense Environmental Restoration Program

DI	Deionized
DMM	Discarded Military Munitions
DoD	Department of Defense
DPT	Direct-push technology
DQI	Data Quality Indicator
DQO	Data Quality Objective
DU	Depleted uranium
DVM	Data Validation Manager
EDD	Electronic data deliverable
EEQ	Ecological effects quotient
EFT	Equipment Function Test
EM	Electromagnetic
EOD	Explosive Ordnance Disposal
EPC	Exposure Point Concentration
ESDA	EOD School Demolition Area
ESS	Explosive Safety Submission
ESSL	Ecological Soil Screening Level
ERA	Ecological Risk Assessment
FBL	Fixed Base Laboratory
FOD	Frequency of Detection
FOL	Field Operations Leader
FS	Feasibility Study
FTMR	Field Task Modification Request
GC/MS	Gas Chromatograph/Mass Spectrometer
GIS	Geographic Information System
GPS	Global Positioning System
HA	Hand auger
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDOP	Horizontal Dilution of Precision
HE	High Explosive
HEAT	High explosive anti-tank
HI	Hazard Index
HMX	Cyclotetramethylene tetronitroamine
HPLC	High Performance Liquid Chromatography
HQ	Hazard Quotient

HSM	Health and Safety Manager
IAS	Initial Assessment Study
ICB	Initial Calibration Blank
ICP	Inductively Coupled Plasma
ICV	Initial Calibration Verification
ICS	Interference Check Sample
IDW	Investigation-Derived Waste
IED	Improvised Explosive Device
ILCR	Incremental lifetime cancer risk
IND	Improvised Nuclear Device
IOD	Inert Ordnance Device
IR	Installation Restoration
IRCDQM	Navy Installation Restoration Chemical Data Quality Manual
IS	Internal Standard
ITS	Instrument Test Strip
IVS	Instrument Verification Strip
LANL	Los Alamos National Laboratory
LC/MS	Liquid Chromatograph/Mass Spectrometer
LCS	Laboratory control sample
LCSD	Laboratory Control Sample Duplicate
LOAEL	Lowest-observed-adverse-effects level
LQL	Laboratory Quantitation Limit
MC	Munitions Constituents
MCB	Marine Corps Base
MCL	Maximum Contaminant Level
MD	Munitions Debris
MDE	Maryland Department of the Environment
MDL	Method detection limit
MEC	Munitions and Explosives of Concern
MI	Multi-Increment
MIS	Multi-Increment Sample
MPPEH	Material Potentially Presenting an Explosive Hazard
MRA/S	Munitions Response Area or Munitions Response Site
MRP	Munitions Response Program
MS	Mass Spectrometer
msl	Mean sea level

MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Not Available
NAD	North American Datum
NAVFAC	Naval Facilities Engineering Command
NAVSEA	Naval Sea Systems Command
NELAP	National Environmental Laboratory Accreditation Program
NEW	Net Explosive Weight
NFA	No Further Action
NFESC	Naval Facilities Engineering Service Center
NG	Nitroglycerine
NIRIS	Naval Installation Restoration Information Solution
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No-observed-adverse-effects level
NOL	Naval Ordanance laboratory
NOSSA	Naval Ordnance Safety and Security Activity
NQA	National Quality Assurance
NSF	Naval Support Facility
NSF-IH	Naval Support Facility-Indian Head
NSF-IHSN	Naval Support Facility Indian Head Stump Neck
NTU	Nephelometric turbidity unit
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PAL	Project Action Limit
PARCC	Precision, Accuracy, Representativeness, Completeness, and Comparability
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
PCBs	Polychlorinated biphenyls
PD	Ponar dredge
PDF	Portable Document Format
PETN	Pentoerythrol tetronitrate
PID	Photoionization detector
PM	Project Manager
POC	Point of Contact
ppb	Parts per billion

PPE	Personal protective equipment
ppm	Parts per million
PQL	Project Quantitation Limit
PQLG	Project Quantitation Limit Goals
PT	Plastic trowel
PVC	Polyvinyl chloride
QA	Quality Assurance
QAM	Quality Assurance Manager
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality Control
QL	Quantitation Limit
QSM	Quality Systems Manual
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RFI/VI	RCRA Facility Investigation/Verification Investigation
RDX	cyclo-1,3,5-methylene-2,4,6-trinitromine
RFA	RCRA Facility Assessment
RI	Remedial Investigation
RPD	Relative Percent Difference
RPM	Remedial Project Manager
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SDG	Sample Delivery Group
SDZ	Safety Danger Zone
SERA	Screening-level ecological risk assessment
SI	Site Inspection
SOP	Standard Operating Procedure
SPCC	System Performance Check Components
SQGs	Soil Quality Guidelines
SQL	Structured Query Language
SQuiRTs	Screening Quick Reference Tables
SSL	Soil Screening Level
SSO	Site Safety Officer
SUXOS	Senior Unexploded Ordnance Supervisor
SVOC	Semivolatile organic compound

SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TBD	To Be Determined
TtNUS	Tetra Tech NUS, Inc.
TNT	Trinitrotoluene
TOC	Total Organic Carbon
TPH	Total petroleum hydrocarbons
TRV	Toxicity reference value
TS	Total Solids
UCL	Upper Confidence Limit
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
UFP	Uniform Federal Policy
UTL	Upper Tolerance Limit
UXO	Unexploded Ordnance
VI	Visual Inspection
VOC	Volatile organic compound
VP	Vice President
VSP	Visual Sample Plan
WMA	Wildlife Management Area
WP	Work Plan
XRF	x-Ray Fluorescence

EXECUTIVE SUMMARY

INTRODUCTION

This Site Inspection (SI) Report for the ten closed ranges located at the Naval Support Facility Indian Head Stump Neck (NSF-IHSN) in Indian Head, Maryland was prepared by Tetra Tech NUS, Inc. (Tetra Tech) for Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic under Contract Task Order (CTO) 423 of the Comprehensive Long-Term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055. This report presents the results of the Munitions and Explosives of Concern (MEC) and munitions constituents (MC) SI conducted at the Stump Neck Annex portion of NSF Indian Head. The general locations of the NSF Indian Head Main Installation and Stump Neck Annex are shown on Figure ES-1. The Valley Impact Area and Stump Neck Impact Area are both located on the Stump Neck Annex (Figure ES-2). These two areas received fire from the Valley Gun Proving Site located on the Main Installation of NSF Indian Head from 1891 through 1921.

BACKGROUND AND PHYSICAL SETTING

The projected firing fan from the Main Installation to the impact areas covers several of the sites discussed in this SI Report. Marine Corps Base (MCB) Quantico was also permitted to fire large artillery at the Stump Neck Annex for several years until 1934.

As a result of the Navy's explosives and munitions training activities, MEC may be present at various sites throughout the Stump Neck Annex. The term MEC includes Discarded Military Munitions (DMM), Unexploded Ordnance (UXO), and MC in high enough concentrations to pose an explosive hazard. This SI Report will cover the 10 munitions sites presented in Table ES-1.

The Department of Defense (DoD) has established the Military Munitions Response Program (MRP) to address closed military ranges. For MRP sites, DoD is following the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. Malcolm Pirnie conducted the initial phase of the CERCLA process, which is the Preliminary Assessment (PA). The PA was completed in September 2005 and identified sixteen ranges, classified as "other than operational range" sites or closed ranges or Munitions Response Areas or Munitions Response Sites (MRA/Ss), for further investigation at the Stump Neck Annex. Five of those ranges are small arms ranges, which were the subject of a separate SI report. One range was determined to require no SI. The remaining ten ranges are addressed in this SI report. The results of the PA, along with further evaluations of data and the planning project meetings among the Navy, EPA Region III, Maryland Department of the Environment (MDE), and

Tetra Tech were used to develop the field program for the SI, which is described in this report along with the results of the field program. The locations of the 10 munitions sites presented in this SI Report are shown on Figure ES-3.

The SI for the ten MRSs consisted of two distinctly different investigations, which were conducted in two phases at each of the sites. The first phase consisted of an MEC investigation, which included detector-aided surface sweeps for MEC, followed by subsurface geophysics investigations. The second phase consisted of an MC investigation.

The MEC field activities included:

- Removal of vegetation (grass mowing and some underbrush removal in forested portions) to support the geophysical surveys and sample collection efforts.
- Detector-aided surface surveys using a metal detector.
- Removal of non-munitions scrap materials.
- Subsurface geophysical investigations.
- Selection of MC sampling locations with anomaly avoidance to supplement existing site data.

The principal objective of the MC investigation was to determine the presence or absence of contamination from MC at the ranges. A secondary objective, if contamination was present, was to provide information on the general extent of contamination.

The MC field activities included:

- Clearing of utilities in the investigation area guided by the use of site utility maps and a Radiodetection RD4000-series pipe and cable locator. Utilities were marked with pin flags, and all sample locations were subsequently positioned at a minimum of 2 feet from these marked locations.

Limited underbrush removal in forested areas (the majority of vegetation removal was performed in the MEC investigation) to support MC sample collection efforts.

- Collection of composite surface soil samples [0 to 0.5 foot below ground surface (bgs) and 0 to 2.0 feet bgs] using a hand auger and a seven point wagon wheel approach.

- Collection of discrete subsurface soil samples via direct push technology (DPT) from depths ranging from 2 to 4 feet bgs and 4 to 6 feet bgs at six sites.

- Collection of sediment samples at depths of 0 to 0.5 feet below ground surface (bgs) from the pond area and along the shoreline of Chicamuxen Creek at UXO-2; from the wetlands at UXO-10 (considered soil/sediment samples); and along a drainage ditch originating from UXO-28 and running through UXO-12 towards wetlands.

- Installation of three temporary wells at UXO-2 for the purpose of further delineating groundwater.

- Collection of groundwater samples at UXO-2 and UXO-4.

- Collection of one surface water sample from the drainage canal at UXO-12.

- Collection of soil and water samples from the Investigation-derived waste (IDW) drums, and removal and disposal of these drums.

- Analysis of a representative number of samples by the fixed base laboratory (FBL) for select Target Analyte List (TAL) metals, explosives, volatile organic compounds (VOCs), cation exchange capacity (CEC), pH, total organic carbon (TOC), and total solids (TS).

Samples were collected during the MC field activities to identify chemicals of potential concern (COPCs) (e.g., metals) that may exist as a result of past operations at the site. If COPCs were detected at concentrations posing a risk to human health or ecological receptors, further investigation may be warranted.

CONCLUSIONS/RECOMMENDATIONS

This section presents a summary of the results of the MEC and MC SI and recommendations for further actions. Table ES-2 contains a summary of the MEC survey activities and Table ES-3 contains a summary of the MC sampling activities. Table ES-4 contains a summary of the MEC survey summary of findings and recommendations, and Table ES-5 contains a summary of the MC sampling summary of findings and recommendations.

TABLE ES-1

SUMMARY OF OTHER THAN OPERATIONAL RANGES
TEN MUNITIONS RESPONSE SITES
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Site Name	Site No.	Size (acres)(1)	Purpose	Dates of Use
Air Blast Pond	UXO 01	3.72	Testing of bulk explosives	1955-1975
Area 8	UXO 02	22.61	Training on and defusing of explosive devices	1957-1999
EOD School Demolition Area	UXO 28	4.64	Demolition area	1944-1949
Basic IED Area	UXO 04	3.79	Training and demonstration of IEDs	1957-1996
Advanced IED Area	UXO 05	10.07	Training and demonstration of IEDs	1953-1995
Stump Neck Impact Area	UXO 10	32.88	Impact area	1891-1940s
Test Area 1	UXO 21	4.52	Communication experiments, AA&D training, IED/IND training, robotics training	1950s-1980s (robotics training 1990s - present)
Valley Impact Area	UXO 26	694	Safety danger zone	1891-1921 (Quantico fired in area 1931-1934)
Torpedo Burial Site	UXO 12	0.88	Burial of torpedoes	Late 1940s-Early 1950s
Torpedo Casing Disposal Area	UXO 23	0.74	Burial of torpedo casings	1950s

(1) Size as noted in the PA (Malcolm Pirnie, 2005)
AA&D - Advanced Access and Disablement
EOD - Explosive Ordnance Device
IED - Improvised Explosive Device
IND - Improvised Nuclear Device

TABLE ES-2

SUMMARY OF MEC SURVEY ACTIVITIES
10 MUNITIONS RESPONSE SITES
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

SITE	NAME	SUMMARY OF MEC SURVEY ACTIVITIES			GIS FIGURES	
		Vegetation Management	UXO Detector-Aided Sweep	Geophysical Survey	GPS Initial Survey Plotted	GPS Final Survey Plotted
UXO-1	Air Blast Pond	Complete	Air Blast Pond (100% Complete)- One Munitions Debris (MD) item discovered on surface.	NA	Complete	Complete
UXO- 2	Area 8	Complete	Area 8- (100% completed) UXO Survey complete on Pond and Chicamuxen Creek with 34 anomalies logged and recorded. Rest of the Area Complete 1 MEC and 10 MPPEH items discovered on the surface. ID of 6 subsurface anomaly clusters using Schonstedt.	NA	Complete	Complete
UXO- 28	EOD School Demolition Areas	Complete	EOD Demo Area- UXO Survey's 100% complete; 3 MPPEH items discovered on surface (two onsite, one offsite).	Geophysical Survey Complete.	Complete	Complete
UXO- 4	Basic IED Area	Complete	Basic IED Area- All transects complete- 0 MEC, 24 MD items discovered on surface. Numerous subsurface anomalies. Area expanded by two additional transects. 100% UXO survey complete.	NA	Complete	Complete
UXO- 5	Advanced IED Area	Complete	Adv IED Area- UXO Survey complete (RPM halted work in the area after the discovery of 28 MEC and 99 MPPEH items on surface.	Geophysical Survey Complete.	Complete	Complete
UXO- 10	Stump Neck Impact Area	Complete	Complete- No MD/MEC discovered on the surface.	Geophysical Survey Complete.	Complete	Complete
UXO- 21	Test Area 1	Complete	Test Area 1-UXO Survey complete - 0 MEC, 12 MD items discovered on surface.	NA	Complete	Complete
UXO- 26	Valley Impact Area	Complete	Complete- 3 MEC and 15 MPPEH items discovered on the surface.	Geophysical Survey Complete.	Complete	Complete
UXO- 12	Torpedo Burial Site	Complete	Torpedo Burial Site- UXO Survey complete; one MD item discovered on surface.	Geophysical Survey Complete.	Complete	Complete
UXO-23	Torpedo Casing Disposal Area	Complete	Torpedo Casing Disposal Area- No MD/MEC discovered on the surface.	Geophysical Survey Complete .	Complete	Complete

Notes:
Not Applicable
Complete

TABLE ES-3

SUMMARY OF MC SAMPLING ACTIVITIES
10 MUNITIONS RESPONSE SITES
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

SITE	NAME	SUMMARY OF MC SAMPLING ACTIVITIES		
		Soil	**Sediment**	**Groundwater**
UXO-1	Air Blast Pond	Collection of 46 soil samples for explosives analyses; and 3 of the soil samples were analyzed for TOC, pH, CEC.		
UXO- 2	Area 8	Collection of 120 soil samples for metals and explosives analyses; and 3 of the soil samples were analyzed for TOC, pH, CEC.	Collection of 7 sediment samples for metals and explosives analyses.	Installation of 3 temporary monitoring wells. Collection of 6 groundwater samples (from 3 existing permanent monitoring wells and 3 temporary monitoring wells) for metals and explosives analyses.
UXO- 28	EOD School Demolition Areas	Collection of 40 soil samples for metals and explosives analyses; and 3 of the soil samples were analyzed for TOC, pH, CEC.		
UXO- 4	Basic IED Area	Collection of 80 soil samples for VOCs, metals, and explosives analyses; and 3 of the soil samples were analyzed for TOC, pH, CEC.		Collection of 3 groundwater samples for VOCs, metals and explosives analyses.
UXO- 5	Advanced IED Area	Collection of 100 soil samples for metals and explosives analyses; and 3 of the soil samples were analyzed for TOC, pH, CEC.		
UXO- 10	Stump Neck Impact Area	Collection of 59 soil/sediment samples for explosives analyses; and 3 of the soil samples were analyzed for TOC, pH, CEC.		
UXO- 21	Test Area 1	Collection of 41 soil samples for explosives analyses and 3 of the soil samples were analyzed for TOC, pH, CEC.		
UXO- 26	Valley Impact Area	No sampling was proposed for the Valley Impact Area.		
UXO- 12	Torpedo Burial Site	Collection of 20 soil samples for explosives analyses; and 3 of the soil samples were analyzed for TOC, pH, CEC.	Collection of 2 sediment samples for explosives analyses.	Collection of 1 surface water sample for explosives analyses.
UXO-23	Torpedo Casing Disposal Area	Collection of 20 soil samples for metals and explosives analyses; and 3 of the soil samples were analyzed for TOC, pH, CEC.		

TABLE ES-4

MEC SURVEY SUMMARY OF FINDINGS AND RECOMMENDATIONS
TEN MUNITIONS RESPONSE SITES
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MEC Results				
Site Name/UXO #	**MEC Surface Finds**	**Shallow Surface Anomalies**	**Geophysical Subsurface Anomalies**	**Recommendations**
Air Blast Pond (UXO-1)	The MEC investigation concluded with 0 MEC and 1 MD discovered on the surface.	NA	NA	**RI/FS**
Area 8 (UXO-2)	One MEC and ten suspect MPPEH items were discovered on the surface.	The UXO Survey was completed on the Pond and Chicamuxen Creek, and 34 anomalies were logged and recorded.	NA	**RI/FS**
Basic IED Area (UXO-4)	Zero MEC, 24 MD items discovered on surface.	Numerous subsurface anomalies.	NA	**RI/FS**
Advanced IED Area (UXO-5)	UXO Survey complete afterRPM halted work in the area after the discovery of 28 MEC and 99 MPPEH items on surface.	NA	Three hundred-thirteen anomaly items were identified during the geophysical survey. Although the items are scattered around the site, many tend to be located in clusters.	**RI/FS**
Stump Neck Impact Area (UXO-10)	Complete- No MD/MEC discovered on the surface.	NA	One hundred-nineteen anomaly items scattered around the site, many clusters.	**RI/FS**
Torpedo Burial Site (UXO-12)	Torpedo Burial Site- UXO Survey complete; one MD item discovered on surface.	NA	Sixty-eight anomalies were discovered during the geophysical survey. Most of the items are present in the western portion of the site.	**RI/FS**
Test Area 1 (UXO-21)	Zero MEC, 12 MD items discovered on surface, mostly found at the southeastern corner of the site.	NA	NA	**NFA**
Torpedo Casing Disposal Area (UXO-23)	No MD/MEC discovered on the surface.	NA	No buried metallic items with unique identifiers were logged and no anomalies were identified. A higher range of the Total Magnetic Field was noted at the southeast corner of the site.	**RI/FS**
Valley Impact Area (UXO-26)	Three MEC and 15 MPPEH items discovered on the surface.	NA	One hundred ninety-seven subsurface geophysical anomalies were identified. Although the items are scattered around the site, many tend to be located in clusters.	**RI/FS**
EOD School Demolition Areas	Three MPPEH items discovered on surface (two onsite, one offsite).		One hundred ten anomaly items were picked. One of the transects had a high concentration of anomalies which may be attributed to the transect being positioned over or near a metallic utility line. The picked items are scattered around the site, but many tend to be located in clusters.	**RI/FS**

NFA = No further action
RI/FS = Remedial Investigation/ Feasibility Study
IM = Interim Measures

TABLE ES-5

MC SAMPLING SUMMARY OF FINDINGS AND RECOMMENDATIONS
TEN MUNITIONS RESPONSE SITES
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MC Results				
Site Name/UXO #	**PAL and Background Screening Exceedances**	**Major Contaminants**	**Risk Screening Evaluation Conclusions**	**Recommendations**
Air Blast Pond (UXO-1)				
Soil (Surface and Subsurface)	**No**	**None**	Explosive analyses for soil samples collected in this SI did not result in any exceedances of the PALs.	**NFA***
Area 8 (UXO-2)				
Surface Soil	**Yes**	**Metals** - Chromium, Copper, Lead, Lithium, Magnesium, Mercury, Tin, Zinc. **Explosives** - Nitrobenzene.	No exceedance of human health criteria and no chemicals were retained as COPCs for ecological receptors.	**RI/FS for Groundwater**
Subsurface Soil	**Yes**	**Metals** - Lithium, Tin, Zinc.	Adverse noncarcinogenic health effects are not anticipated.	
Sediment	**No**	**None**	**NA**	
Groundwater	**Yes**	**Unfiltered Metals:** Aluminum, Arsenic, Cobalt, Iron, Manganese, Vanadium. **Filtered Metals**: Aluminum, Arsenic, Cobalt, Iron, Manganese, Vanadium.	The Background and PALs are exceeded in groundwater after filtration for aluminum, arsenic, cobalt, iron, manganese, and vanadium.	
Basic IED Area (UXO-4)				
Surface Soil	**Yes**	**Metals:** Aluminum, Antimony, Copper, Lead, Lithium, Mercury, Nickel, Tin, Zinc. **Volatiles:** Benzene.	Adverse noncarcinogenic health effects are not anticipated. No chemicals were retained as COPCs for ecological receptors.	**RI/FS for Groundwater**
Subsurface Soil	**Yes**	**Metals:** Lithium and Zinc. **Volatiles**: Benzene.	Adverse noncarcinogenic health effects are not anticipated.	
Groundwater	**Yes**	**Unfiltered Metals:** Aluminum, Arsenic, Cobalt, Iron, Manganese, Vanadium. **Filtered Metals**: Aluminum, Cobalt.	The Background and PALs are exceeded in groundwater after filtration for aluminum and cobalt.	
Advanced IED Area (UXO-5)				
Surface Soil	**Yes**	**Metals:** Aluminum, Arsenic, Copper, Manganese, Mercury, Nickel, Zinc. **Explosives:** Nitroglycerin.	Adverse noncarcinogenic health effects are not anticipated. No chemicals were retained as COPCs for ecological receptors.	
Subsurface Soil	**Yes**	**Metals:** Aluminum, Barium, Cadmium, Lithium, Tin, Zinc.	Adverse noncarcinogenic health effects are not anticipated.	**NFA***

TABLE ES-5

MC SAMPLING SUMMARY OF FINDINGS AND RECOMMENDATIONS
TEN MUNITIONS RESPONSE SITES
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MC Results				
Site Name/UXO #	**PAL and Background Screening Exceedances**	**Major Contaminants**	**Risk Screening Evaluation Conclusions**	**Recommendations**
Stump Neck Impact Area (UXO-10)				
Surface Soil	**No**	**NA**	Based on the statistical calculations, a human health risk screening evaluation was not performed. Explosives screening values were not exceeded at any surface sampling locations, which is the interval of interest for ecological risk screening.	**NFA***
Subsurface Soil	**Yes**	**Explosives:** Nitroglycerin	Based on the statistical calculations, a human health risk screening evaluation was not performed.	
Torpedo Burial Site (UXO-12)				
Subsurface Soil	**No**	**NA**	Based on results, a human health risk screening evaluation was not performed.	**NFA***
Sediment	**No**	**NA**	Based on results, human health risk screening and ecological risk screening evaluations were not performed.	
Surface Water	**Yes**	**Explosives:** 2,4,6-trinitrotoluene and 2,4-dinitrotoluene	These concentrations are much less than the USEPA Region 3 Freshwater Screening levels of 100 µg/L and 44 µg/L for 2,4,6-trinitrotoluene and 2,4-dinitrotoluene, respectively. Therefore, these chemicals are not considered ecological COPCs for aquatic biota at UXO-12.	
Test Area 1 (UXO-21)				
Surface Soil	**No**	**NA**	Based on results, human health risk screening and ecological risk screening evaluations were not performed.	**NFA**
Torpedo Casing Disposal Area (UXO-23)				
Subsurface Soil	**Yes**	**Metals:** Aluminum, Iron, Lithium, Tin.	Based on a human health risk screening, no metals constituents were retained as COPCs.	**NFA***
Valley Impact Area (UXO-26)				
No MC Sampling	**NA**	**NA**	**NA**	**NFA***
EOD School Demolition Areas				
Surface Soil	**Yes**	**Metals:** Antimony, Chromium, Copper, Lead, Magnesium, Mercury, Silver, Zinc.	Adverse noncarcinogenic health effects are not anticipated. No chemicals were retained as COPCs for ecological receptors.	**NFA***

***NFA = No further action, however if during the MEC/MPPEH investigaiton, MEC and MPPEH is discovered, further MC sampling may be recommended.**
RI/FS = Remedial Investigation/ Feasibility Study

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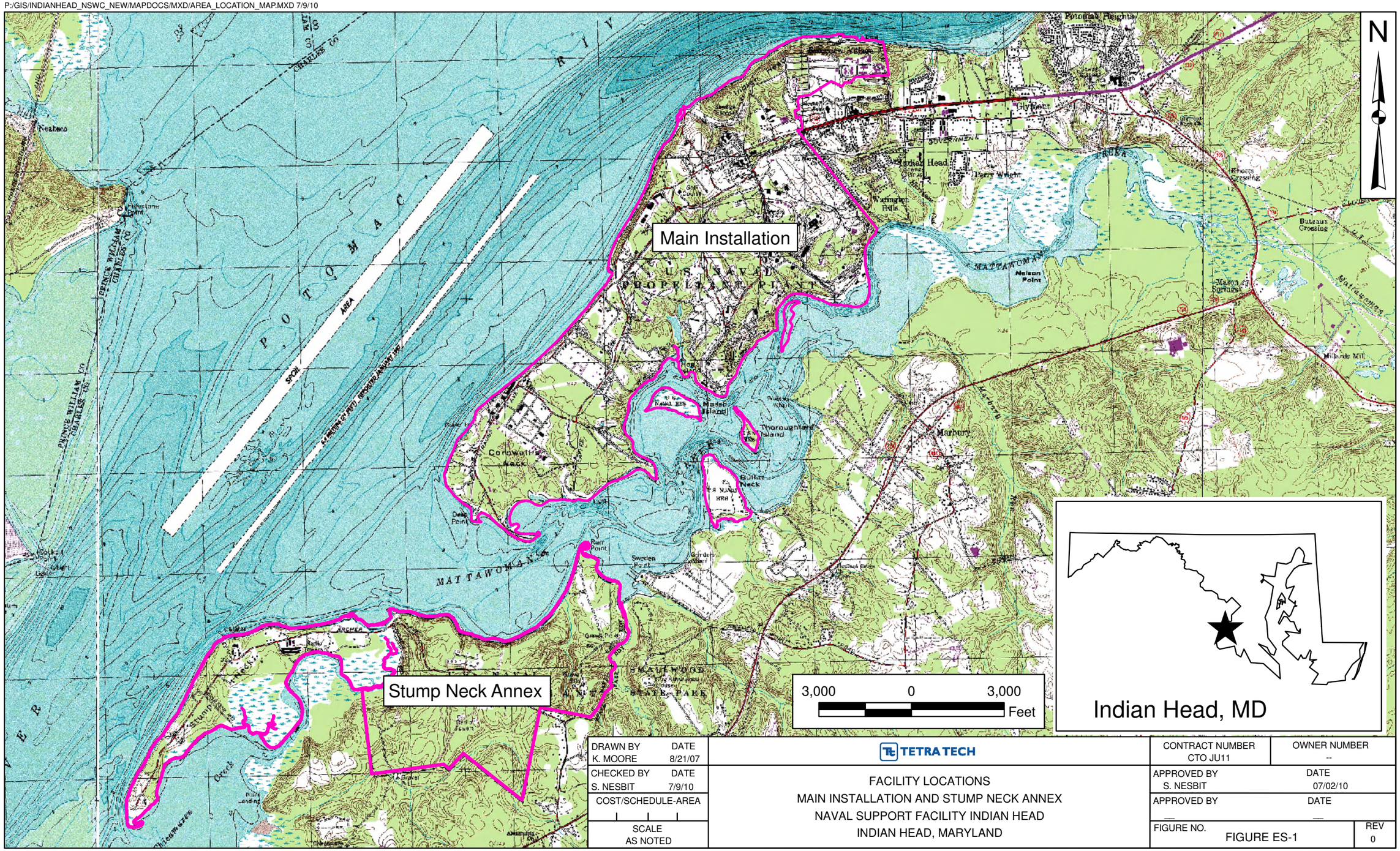

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CHECKED BY S. NESBIT	DATE 7/9/10	FACILITY LOCATIONS MAIN INSTALLATION AND STUMP NECK ANNEX NAVAL SUPPORT FACILITY INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY S. NESBIT / DATE 07/02/10
COST/SCHEDULE-AREA			APPROVED BY — / DATE —
SCALE AS NOTED			FIGURE NO. FIGURE ES-1 / REV 0

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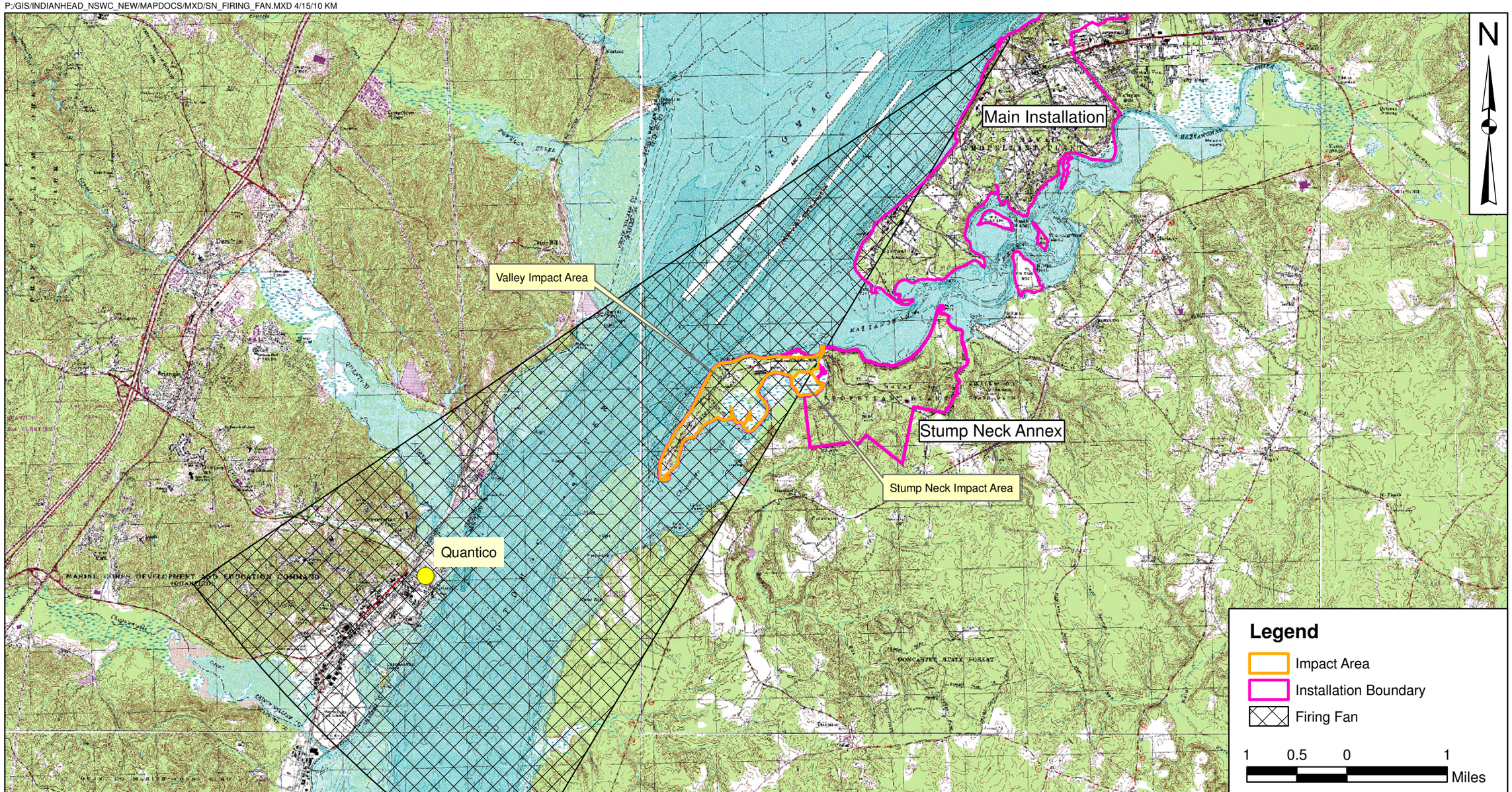

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COST/SCHEDULE-AREA			APPROVED BY __ / DATE __
SCALE AS NOTED			FIGURE NO. FIGURE ES-2 / REV 0

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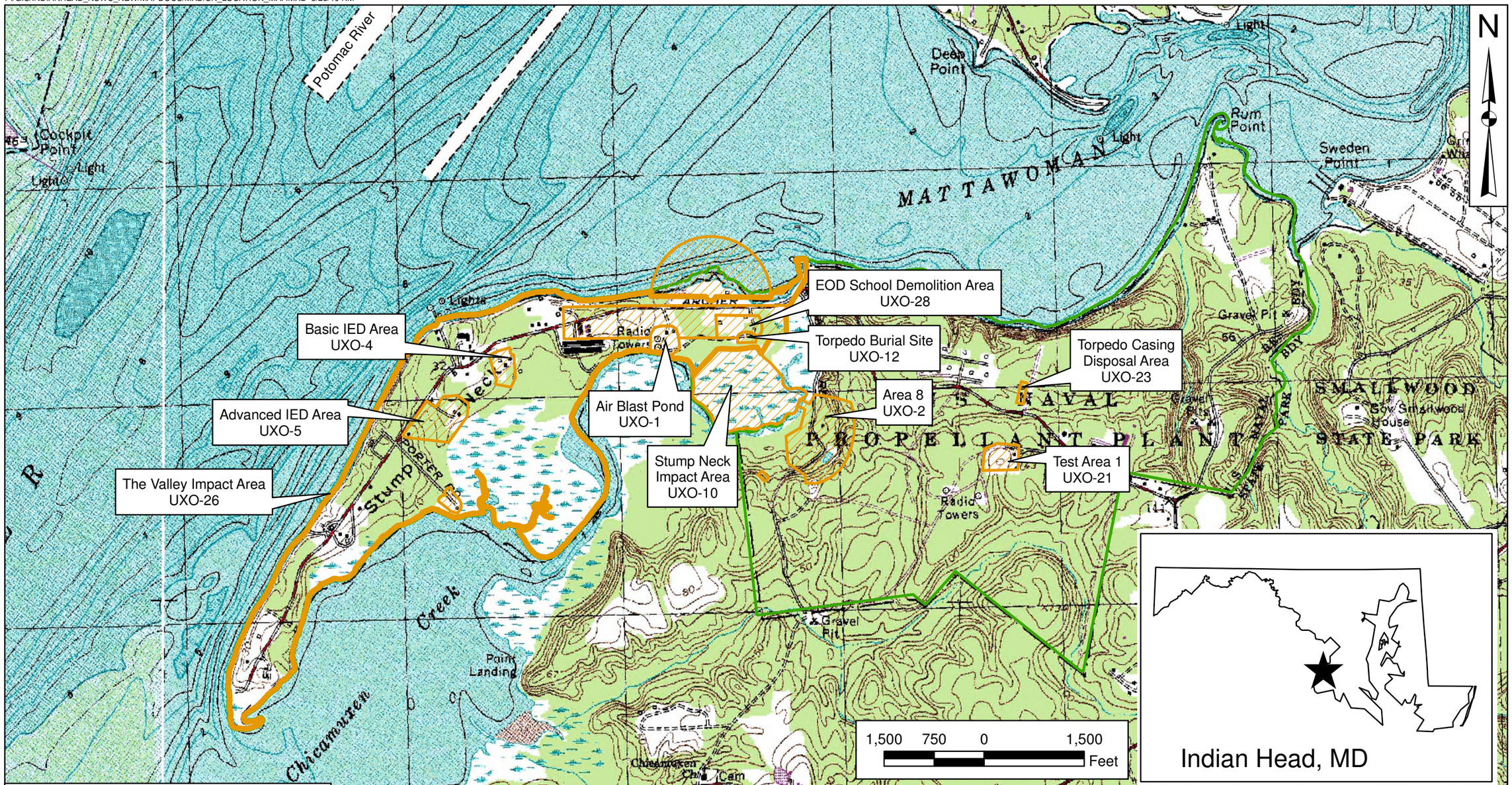

Legend

- MRP Site Boundary for Valley Impact Area
- MRP Site Boundary
- Installation Boundary

DRAWN BY / DATE	K. MOORE / 8/22/07
CHECKED BY / DATE	E. BERKLITE / 5/28/10
COST/SCHEDULE-AREA	
SCALE	AS NOTED

Tetra Tech NUS, Inc.

RANGE LOCATION MAP

NAVAL SUPPORT FACILITY INDIAN HEAD

INDIAN HEAD, MARYLAND

CONTRACT NUMBER	4020
OWNER NUMBER	--
APPROVED BY / DATE	— / —
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FIGURE NO.	FIGURE ES-3
REV	0

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT AND SCOPE OF WORK

This Site Inspection (SI) Report for the munitions response sites (MRSs) located at the Naval Support Facility Indian Head Stump Neck (NSF-IHSN) in Indian Head, Maryland was prepared by Tetra Tech NUS, Inc. (Tetra Tech) for Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic under Contract Task Order (CTO) 423 of the Comprehensive Long-Term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055. This report presents the results of the SI conducted at the Stump Neck Annex portion of NSF Indian Head for MRSs. Figure ES-3 lists the sites by Unexploded Ordnance (UXO) number and name.

The Department of Defense (DoD) has established the Munitions Response Program (MRP) to address closed military ranges for the presence of MEC and munitions constituents (MC). The term MEC distinguishes between specific categories of military munitions that may pose unique explosives safety risks, and may refer to any of the following types of munitions:

- UXO, as defined in 10 U.S.C. 101 (E)(5)(A) through (C).
- Discarded military munitions (DMM), as defined in 10 U.S.C. 2710 (e)(2).
- MC (e.g., TNT, RDX), as defined in 10 U.S.C. 2710 (e)(3), present in high enough concentrations to pose an explosive hazard.

The term MC is defined as any materials originating from unexploded ordnance, discarded military munitions, or any other military munitions (including explosive and non-explosive materials); and emission, degradation, or breakdown elements of such ordnance or munitions (10 U.S.C. 2710).

A Munitions Response Area (MRA) is defined as any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. An MRA can be composed of one or more munitions response sites. For MRP sites, DoD follows the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. Malcolm Pirnie conducted the initial phase of the CERCLA process at NSF-IHSN, which is the Preliminary Assessment (PA). The PA was completed in September 2005 and identified ten ranges at which MEC and MC could be present. The results of the PA were used to develop the field program for the SI. The field program for the SI, and its results are described in this report.

1.2 PURPOSE

The SI for the ten MRSs consisted of two distinctly different investigations, which were conducted in two phases at each of the sites. The first phase consisted of an MEC investigation, which included detector-aided surface sweeps for MEC, followed by subsurface geophysics investigations. The second phase consisted of an MC investigation.

During the MEC investigation at each site, initial field data were collected during a detector-aided surface survey. Then, a subsurface geophysics investigation was conducted to determine:

- Whether MEC or material potentially presenting an explosive hazard (MPPEH), or munitions debris (MD) were present on the surface.
- Whether subsurface anomalies were present that could be MEC or MPPEH.
- Locations where MC could be present for collection of MC samples.

The results of the MEC investigation and information from the PA were used to determine the locations where samples were to be collected during the subsequent MC investigation. During the MC investigation, initial field data were collected at each site to determine whether MC (e.g., lead) from previous site operations are present and potentially contributing to environmental impacts in surface soil, subsurface soil, or sediment. These field data were also used to further develop the Conceptual Site Model (CSM), and to recommend potential future site actions.

This SI report describes the results of the MEC and MC investigations.

1.3 SCOPE OF WORK

The information provided in the UFP SAP was developed based on the results of three project scoping meetings among the planning team, which consists of representatives of the Navy, United States Environmental Protection Agency (U.S. EPA) Region 3, Maryland Department of the Environment (MDE), and Tetra Tech. SI field activities at the ten “other than operational” ranges are described in the following paragraphs.

The MEC field activities included:

- Removal of vegetation (grass mowing and some underbrush removal in forested portions) to support the geophysical surveys and sample collection efforts.
- Detector-aided surface surveys using a metal detector.
- Removal of non-munitions scrap materials.
- Subsurface geophysical investigations.
- Use of facility EOD to perform removals.
- Selection of MC sampling locations with anomaly avoidance to supplement existing site data.

The principal objective of the MC investigation was to determine the presence or absence of contamination at the sites. A secondary objective, if contamination was present, was to provide information on the general extent of contamination.

The MC field activities at the ten "other than operational" ranges included:

- Clearing of utilities in the investigation area guided by the use of site utility maps and a Radiodetection RD4000-series pipe and cable locator. Utilities were marked with pin flags, and all sample locations were subsequently positioned at a minimum of 2 feet from these marked locations.

Limited underbrush removal in forested areas (the majority of vegetation removal was performed in the MEC investigation) to support MC sample collection efforts.

- Collection of composite surface soil samples [0 to 0.5 foot below ground surface (bgs) and 0 to 2.0 feet bgs] using a hand auger and a seven point wagon wheel approach.

- Collection of discrete subsurface soil samples via direct push technology (DPT) from depths ranging from 2 to 4 feet bgs and 4 to 6 feet bgs at six sites.

- Collection of sediment samples at depths of 0 to 0.5 feet below ground surface (bgs) from the pond area and along the shoreline of Chicamuxen Creek at UXO-2; from the wetlands at UXO-10 (considered soil/sediment samples); and along a drainage ditch originating from UXO-28 and running through UXO-12 towards wetlands.

- Installation of three temporary wells at UXO-2 for the purpose of further delineating groundwater.

- Collection of groundwater samples at UXO-2 and UXO-4.

- Collection of one surface water sample from the drainage canal at UXO-12.

- Collection of soil and water samples from the Investigation-derived waste (IDW) drums, and removal and disposal of these drums.

- Analysis of a representative number of samples by the fixed base laboratory (FBL) for select Target Analyte List (TAL) metals, explosives, volatile organic carbons (VOCs), cation exchange capacity (CEC), pH, total organic carbon (TOC), and total solids (TS), as listed on worksheet 15 of the UFP SAP.

Samples were collected during the MC field activities to identify chemicals of potential concern (COPCs) (e.g., metals) that may exist as a result of past operations at the site. If contaminants were detected at concentrations posing a risk to human health or ecological receptors, further investigation may be warranted.

1.4 OBJECTIVES

The primary objective of this SI was to determine whether further response actions or remedial investigations are appropriate to restore any of the sites identified in the PA to an acceptable environmental condition. The SI utilized the background information provided in the PA to plan the collection of supplemental site-specific environmental data, so that the nature and extent of any MC contamination at the sites identified in the PA Report could be further characterized.

The specific goals of the SI were to:

- Determine whether explosives or other MC are present within the study areas in quantities or concentrations that would require the Navy to proceed to a Remedial Investigation/Feasibility Study (RI/FS).

- Determine whether MC or other contaminants are present within the study areas in quantities or concentrations that require an immediate response. If such quantities or concentrations are present, then an appropriate response would be initiated. If no imminently hazardous MC or other contaminants are present, then no immediate action would be taken.

1.5 REPORT ORGANIZATION

This SI Report consists of 13 sections:

- Section 1.0 – Introduction - includes the purpose and scope and report organization.
- Section 2.0 – Facility Background and Physical Setting - describes the background and physical setting of the Indian Head Stump Annex 10 munitions response sites, including initial SI site surveys.
- Section 3.0a – MEC General Methodology-describes the MEC SI field work design and methodologies.
- Section 3.0b – MC General Methodology - describes the MC SI field work design and methodologies.
- Sections 4.0 through 13.0 – Site Name (UXO #) - discuss the SI of each of the 10 individual MRSs, including data results, updated CSMs, and conclusions and recommendations.

The appendices include the following:

- Appendix A – SOPs
- Appendix B – Visual Sample Plan
- Appendix C – MEC SI Field Forms
- Appendix D – MEC SI Site Photos
- Appendix E – Geophysical Data
- Appendix F – MC SI Field Forms
- Appendix G– MC SI Site Photos
- Appendix H – Laboratory Appendix Tables
- Appendix I – Data Validation/Usability Assessment (includes all background information)
- Appendix J – Statistical Calculation Summary
- Appendix K – Human Health Risk Screening Supporting Documentation
- Appendix L – Ecological Risk Screening Supporting Documentation

2.0 FACILITY BACKGROUND AND PHYSICAL SETTING

2.1 GENERAL FACILITY BACKGROUND AND PHYSICAL SETTING

2.1.1 General Background

The Navy has conducted various testing, training, and disposal activities related to military munitions at the Stump Neck Annex, NSF Indian Head, Maryland, since it was established in 1890 as a Naval Ordnance Station. The general locations of the NSF Indian Head Main Installation and Stump Neck Annex are shown on Figure ES-1. The Valley Impact Area and Stump Neck Impact Area are both located on the Stump Neck Annex (Figure ES-2). These two areas received fire from the Valley Gun Proving Site located on the Main Installation of NSF Indian Head from 1891 through 1921. Various caliber guns (4-inch through 16-inch) were fired into these two areas. The projected firing fan from the Main Installation to the impact areas covers several of the sites discussed in this SI Report. In addition to fire from the gun proving site, the Stump Neck Impact Area received impacts from a firing range set up in the vicinity of Rum Point. Marine Corps Base (MCB) Quantico was also permitted to fire large artillery at the Stump Neck Annex for several years until 1934. As a result of the Navy's explosives and munitions training activities, MEC may be present at various sites throughout the Stump Neck Annex.

The locations of the ten sites presented in this SI Report are shown on Figure ES-3. Table ES-1 summarizes the ten "other than operational ranges" at the Stump Neck Annex that were evaluated in this SI Report and summarized in the PA Report (Malcolm Pirnie, 2005).

2.1.2 History

Established in 1890, NSF-IH is the Navy's oldest ordnance station. Throughout its long and distinguished history, the facility has proved guns, armor, and propellants; developed and manufactured powder and propellants; and has been recognized as a leader in energetics research and development. Shortly after operations commenced, additional property was acquired by the Navy to increase the size of the installation. The most notable acquisition was of Stump Neck Annex as an impact area and safety buffer in 1901. Stump Neck Annex was formerly the home of the Improvised Explosive Device (IED) School where research is conducted on rendering safe technologies for items encountered in hostile situations by law enforcement and security personnel which has no relocated to Florida. The EOD Technology Division is also a tenant of Stump Neck Annex. Their mission is to utilize technology to develop and deliver EOD information, tools, and equipment, and to meet the needs of Joint Services EOD operating forces and other customers. In recent decades, NSF-IH has become known as a center of excellence in

the development and manufacturing of specialized energetic materials used in demolition and propulsion, and is now under the direction of the Naval Sea Systems Command (NAVSEA).

2.1.3 Location and Setting

NSF-IH is located in northwestern Charles County, Maryland, (Figure ES-1). The Stump Neck Annex covers approximately 1,100 acres on the Stump Neck peninsula at the confluence of the Potomac River and Chicamuxen Creek. Stump Neck Annex was acquired to support activities at the 2,300-acre Indian Head Main Installation. These two Navy properties are not contiguous; the Indian Head Main Installation is northeast of the Stump Neck Annex across Mattawoman Creek. General Smallwood State Park and private property parcels are located east and southeast, respectively, of Stump Neck Annex, and the Chicamuxen Wildlife Management Area (WMA) is to the south across Chicamuxen Creek.

2.2 GENERAL FACILITY PHYSICAL/ENVIRONMENTAL CHARACTERISTICS

2.2.1 Climate

Stump Neck Annex is located on the eastern shore of the Potomac River and has a continental-type climate with four well-defined seasons. Located in the middle latitudes of North America, atmospheric flow is from west to east. The Potomac River and its tributaries significantly affect the climate, moderating extreme temperatures and causing higher humidity in the region. In the winter, the Blue Ridge and Appalachian mountain ranges located west of the Stump Neck Annex obstruct the cold, continental air. The coldest period occurs in late January and early February, with low temperatures averaging 29 degrees Fahrenheit (ºF). July is the warmest month, with average high temperatures of 85ºF. Annual precipitation is well distributed, with July and August as the wettest months. Average annual precipitation is 44 inches. Maximum snow accumulation averages 9 inches between November and March. The growing season lasts approximately 190 days, starting in mid-April.

2.2.2 Topography

NSF-IH occupies two peninsulas along the eastern shore of the Potomac River. The Stump Neck Annex is on the southern peninsula, and the Main Installation is located on the northern peninsula. The two peninsulas are separated by Mattawoman Creek. The general topography of the mainland areas of Charles County can be described as gently rolling lands with a few steep slopes. These areas include many drainage swales and streams. Shoreline areas at NSF-IH are generally steeply sloped. The Stump Neck Annex has a relatively low topographic profile. The highest point is the northeastern portion of the peninsula at an elevation of approximately 140 feet above mean sea level (msl). The lowest points lie

along the shorelines of the Stump Neck Annex adjacent to Mattawoman Creek and Chicamuxen Creek. These areas are mostly flat, tidal marsh areas, although several 50- to 60-foot bluffs exist along Mattawoman Creek.

2.2.3 Regional Geology

The Stump Neck Annex lies within the Atlantic Coastal Plain Physiographic Province 8 to 10 miles east of the Fall Line that marks the western extent of the physiographic province. The regional geology consists of a sedimentary wedge of Cretaceous to Quaternary fluvial and marine deposits overlying crystalline Precambrian metamorphic and igneous bedrock. The sedimentary wedge dips and thickens eastward and ranges in thickness from 550 feet to 900 feet in the vicinity of the Stump Neck Annex (Vroblesky, and Fleck, 1991; Hiortdahl, 1990). It lies non-conformably on the crystalline basement rock surface, which dips to the east. The geologic units underlying NSF-IH, in stratigraphically ascending order, are the Lower Cretaceous Potomac Group, Tertiary Aquia Formation of the Pamunkey Group, fluvial-estuarine deposits of Tertiary to early Quaternary age, and undivided Quaternary deposits.

The lithology of the Potomac Group consists of interbedded clay, silt, sand, and gravel deposited in fluviodeltaic environments (Hiortdahl, 1990). The Potomac Group ranges in thickness from 650 to 750 feet in the vicinity of the Stump Neck Annex (Vroblesky and Fleck, 1991; Harsh and Laczniak, 1990), and consists of three geologic units (in ascending stratigraphic order): the Patuxent Formation, Arundel Formation, and Patapsco Formation. The Patuxent Formation consists of sand and pebbles with thin clay interbeds and is 300 to 400 feet thick in the study area. The Arundel Formation generally consists of massive clay with abundant lignite and siderite concretions and is less than 100 feet thick beneath most of the study area. The Patapsco Formation generally consists of sand and silt separated by thick clay layers. The interpreted thickness of the Patapsco Formation in the study area varies from about 200 feet to more than 450 feet (Hiortdahl, 1997). The Aquia Formation (Upper Paleocene) consists of marine deposits of olive black to olive gray, micaceous, glauconitic quartz sand interbedded with sand, silt, and clay. The formation is 0 to 80 feet thick in the NSF-IH peninsula area.

The younger units of the Pamunkey Group and the Chesapeake Group have been removed by erosion in the study area. Overlying the Aquia Formation are fluvial-sedimentary deposits consisting of gravel, sand, and loam. These sediments are referred to as “upland deposits” and range in age from Pliocene to early Pleistocene (Hiortdahl, 1997). The upland deposits crop out at the surface in the northern portion of NSF-IH where surface elevations exceed 40 feet above msl. However, beneath most of the study area, the surficial sediments consist of Pleistocene paleochannel deposits and Holocene alluvial and paludal deposits (Hiortdahl, 1997). These deposits consist of gravel, sand, silt, clay, and peat mixtures with

irregular bedding and with an aggregate thickness of 0 to approximately 40 feet. The Aquia Formation and younger upland deposits are missing in many locations in the NSF-IH peninsula area as a result of erosion and deposition in Pleistocene and Holocene paleochannels. Where this occurs, the overlying Quaternary deposits directly overlie the Cretaceous formations.

2.2.4 Soil and Vegetation

Charles County is located in the inner Potomac Coastal Plain geologic province. The soils in this area are derived from unconsolidated marine sediments that vary from sandy to clayey in texture and from excessively well drained to poorly drained. Hydric and erodible soils are prevalent. High water tables, severe erosion, earthslides, and hardpans are common.

The United States Department of Agriculture (USDA) mapped the soils of the Stump Neck Annex in the Soil Survey of Charles County, Maryland (1974). The main soil series in this area are the Beltsville, Keyport, and Elkton silt loams. Some additional soil types found at the Stump Neck Annex are cut-and-fill land, gravelly land, tidal marsh, and Mattawan soil. The eastern area of the Stump Neck Annex is primarily composed of the Beltsville silt loam, with a small area of gravelly land. Beltsville series soils consist of silt and sand with moderate amounts of clay. They are nearly level to moderately sloping, moderately deep, strongly acidic, slowly permeable, and well drained. Gravelly land is composed of gravelly deposits with soil types that are unidentifiable because of severe erosion.

2.2.5 Hydrology

The three primary waterways in the area are the Potomac River, Mattawoman Creek, and Chicamuxen Creek. The Potomac River and Mattawoman Creek border the Main Installation; and the Potomac River, Mattawoman Creek, and Chicamuxen Creek border the Stump Neck Annex. The Potomac River is a continuous, slow-moving, slightly brackish, tidal tributary to the Chesapeake Bay. Mattawoman Creek and Chicamuxen Creek are tributaries to the Potomac River and are also tidally influenced. Both have large floodplains and contain large expanses of tidal wetlands and swamps. Many small streams cross the area, most of which drain directly into one of the three major waterways.

2.2.6 Regional Hydrogeology

The hydrogeologic framework of the Indian Head area consists of a surficial aquifer and three major underlying confined aquifers: the lower Patapsco aquifer, upper Patuxent aquifer, and lower Patuxent aquifer. Although underlying the surficial aquifer, the upper Patapsco aquifer is considered a poor producer of groundwater in the area and is not considered to be a major aquifer at NSF-IH. Rather than

continuous bodies of sands, the individual confined aquifers consist of multiple sand layers interbedded with lower permeability layers. The aquifers are described in detail below. Shallow, unconfined to semi-confined groundwater at NSF-IH occurs in the surficial aquifer from near surface to approximately 45 feet bgs, with water table elevations ranging from sea level to approximately 65 feet above msl. Depending on location, the surficial aquifer is composed of Quaternary paleochannel deposits, Tertiary to Quaternary upland deposits, the Aquia Formation, or sediments of Patapsco Formation. Typically, shallow groundwater occurs in perched water-bearing zones and is recharged from infiltration (Hart, 1983). In some lowland areas, surface water intrusion may be an additional source of recharge of the shallow aquifer along the edges of water bodies and during periods of high tide. Shallow groundwater flow follows the topography and discharges to local surface water bodies. The descriptions and hydrogeologic properties of the confined aquifers presented in this section are derived primarily from Andreasen (1999).

The top of the lower Patapsco aquifer lies at 70 to 200 feet below sea level in the study area, with a thickness ranging from 65 to 140 feet. The transmissivity of the lower Patapsco aquifer ranges from about 190 to 700 square feet per day (ft^2/d) near Indian Head. The aquifer is underlain by relatively low permeability sediments of the Patapsco Formation and by the low-permeability Arundel Clay. In most places the Arundel Clay serves as an effective confining unit between the lower Patapsco and upper Patuxent aquifers, although a hydraulic connection occurs where the Arundel Clay is thin or more heterogeneous.

The lower Patapsco aquifer is the principal water-supply aquifer at NSF-IH, and its potable water wells are typically screened in multiple sand layers within this aquifer at an average depth of 200 to 300 feet. These potable water wells serve approximately 4,050 people, including civilian and enlisted Navy employees and contractor employees. According to the installation, there are two potable wells located on the Stump Neck Annex. Well #42 SN was installed in 1945 and currently has minimal output. The other well, #2012 SN, was installed in 1953. NSF-IH is considering several rehabilitation options including closing #42 SN and using #2012 SN as the main well, or installing an additional well on Stump Neck Annex. There are also several private wells near Rum Point. These wells are tested quarterly or monthly, if regularly used. Although none of the NSF-IH wells supply reserves or residences beyond the facility boundaries, the lower Patapsco aquifer is used extensively for domestic and municipal water supplies in northwestern Charles County. Several production wells are screened in this aquifer northeast of NSF-IH, in and near the towns of Indian Head and Potomac Heights.

The upper Patuxent aquifer lies at 400 to 600 feet below sea level in the study area and is about 50 to 70 feet thick. The transmissivity of the upper Patuxent aquifer ranges from about 150 to 2,600 ft^2/d in

northwestern Charles County. Relatively low-permeability sediments of the Patuxent Formation underlie this aquifer.

The top of the lower Patuxent aquifer lies at 800 to 1,000 feet below sea level in the study area and is about 100 feet thick. Few potable water wells are screened in the lower Patuxent aquifer because of the availability of water from the overlying confined aquifers. The lower Patuxent aquifer is underlain by crystalline basement rock. Water levels in the upper and lower Patuxent aquifer are generally similar because of the leaky nature of the intervening confining unit.

2.3 REGIONAL ECOLOGY SUMMARY

2.3.1 Endangered/Threatened Species

According to the 1997 Wildlife Management Plan, three endangered species are located within the Stump Neck Annex. Two of these three species, the rainbow snake and joint-vetch (flowering plant of the pea family), are federally endangered. The third species, the scaly blazing-star (perennial herb), is a species of special concern in the State of Maryland. In the July 2001 Threatened and Endangered Plant/Animal Species of Charles County, Maryland Report, the Maryland Department of Natural Resources Wildlife and Heritage Service listed these three species as federally and/or state endangered for Charles County. Table 2-1 summarizes the protected species known to occur or potentially occurring at NSF-IHSN.

2.3.2 Wetlands

The Stump Neck Annex is bordered by and contains large tracts of both tidal and non-tidal wetlands. Wetlands and floodplains are valuable habitats for wildlife, important groundwater recharge areas, and filters for surface water runoff, thus minimizing siltation and erosion. They are also important aesthetic buffers, scientific resources, and in some cases, recreational areas. Based on the drainage divides presented in the 1983 Initial Assessment Study (IAS) conducted at NSF Indian Head, the majority of the natural drainage at the Stump Neck Annex flows to Mattawoman Creek and Chicamuxen Creeks (Hart, 1983). Treated wastewater effluent is discharged directly to the Potomac River or Mattawoman Creek and is also discharged from outfalls to tributaries of these two waterways. The wastewater consists of industrial, sanitary, and storm effluents or combinations thereof.

2.3.3 Cultural and Archaeological Resources

Charles County contains approximately 261.5 people per square mile (mi^2) according to the 2000 United States Census. NSF-IH and its tenant commands employ approximately 3,600 military and civilian

personnel. Indian Head is the county's largest employer. Over 76 percent of the employees at the base live within Charles County. Approximately 500 military and family members live on the installation; however, no military or family members live on Stump Neck Annex. Recreation on and around the installation includes hunting and fishing by permit. The Chicamuxen WMA is located approximately 245 feet downstream of the Marine Rifle Range, and is used by recreational hikers, hunters, and fishers. Residential properties are located 2 miles south of the range.

A Phase I Cultural Resources Survey and Supplemental Architectural Investigations were conducted at Stump Neck in 1996. As a result, 33 sites were identified and investigated. Only 17 of 33 were recommended for Phase II evaluations to determine their eligibility for listing on the National Register of Historic Places. None of these 17 sites overlap with the former ranges discussed in this report:

The architectural evaluation verified three National Register-eligible historic districts and identified one additional district: the Indian Head Residential Historic District containing 64 contributing resources; the Naval Powder Factory District containing 124 contributing resources; the Naval Proving Ground Historic District containing no contributing resources; and the Extrusion Plant Historic District containing 63 contributing resources. An additional area of the base, the Polaris facility, was recommended for further research, as it was considered potentially eligible for the National Register as an exceptionally significant area. The exact locations of the contributing resources within these districts were not available.

2.3.4 Water Resources

Fishing is permitted in Mattawoman Creek. No other water resource information was provided in the PA.

2.3.5 Coastal Zones

The Coastal Zone of Maryland includes all land and water lying within coastal counties, one of which is Charles County. Within the Coastal Zone, Maryland has defined an area within which strict land use management is needed to protect the Chesapeake Bay. The critical area is defined as a 1,000-foot-wide strip of land surrounding the bay and its tidal tributaries. Most construction within 100 feet of the Mean High Water Line (buffer) is prohibited.

TABLE 2-1

SUMMARY OF KNOWN OR POTENTIAL PROTECTED SPECIES
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Ecological Receptor	Species
Federal Endangered	Rainbow snake
	Joint-vetch
Federal Threatened	None reported
State Endangered	Scaly blazing-star
State Threatened	Non reported

Sources of data include:
NSF-IH Wildlife Management Plan, 1997.
Threatened and Endangered Plant/Animal Species of Charles County, Maryland, July 2001, Department of Natural Resources.

3.0A MEC GENERAL METHODOLOGY

3A.1 MEC SI APPROACH

The SI for the ten MRSs consisted of two distinctly different investigations, which were conducted in two phases. The primary objective of the first phase of this SI was to identify locations of MEC, MPPEH, munitions debris, and geophysical anomalies, utilizing hand-held detectors and geophysical instruments. The second phase was sampling for MC based on the results of the MEC investigation. The SI utilized the background information provided in the PA to plan the collection of supplemental site-specific environmental data, so that types and quantity estimates of MEC/MPPEH/munitions debris could be determined, and site boundaries could be refined (footprint reduction or expansion). This methodology section describes the MEC investigation and is designed to be "stand alone" in regards to the technical details of the MEC investigation. The MEC SI field activities were performed in November, 2009 through February, 2010 at the ten Munitions Ranges located at NSF-IH Stump Neck Annex, Maryland.

Ten MRP sites were investigated in this SI. The goals of the MEC phase of the SI Program for the MRSs were:

- Evaluate historical information to determine, if possible, whether each site was an artillery impact range, or whether explosives may have been used for training or demonstrational purposes (MEC).

- Perform area UXO surface surveys as site conditions require, and then execute geophysical surveys to assess these areas of the sites.

- Determine the MC sampling locations for the second phase of the SI, based on the results of the UXO surface surveys and geophysical surveys.

The SOPs used during the SI are attached in Appendix A and are summarized below:

- SOP OPS 1 - UXO Detector Aided Surface Surveys - Describes detector-aided surface surveys.

- SOP OPS 2 - Geophysical Survey - Describes geophysical surveys.

- SOP OPS 3 - Geophysical Data Processing and Analysis - Describes geophysical data processing procedures.

- SOP OPS 4 - MEC Management and Accountability - Describes actions to be taken if suspect MEC are encountered.

- SOP OPS 5 - Global Positioning System - Describes usage of hand-held global positioning system (GPS) units.

- SOP OPS 6 - Vegetation Management - Describes brush cutting and vegetation clearance activities to take place at MEC sites.

3A.2 PRELIMINARY ACTIVITIES

3A.2.1 Utility Clearance

A utility clearance and/or Dig Permit was requested from the Navy prior to conducting instrument test strip (ITS) operations and is discussed in Section 3.2.6. The utility clearance in the areas where DPT for MC subsurface sampling was proposed will be discussed in Section 3.0B.

3A.2.2 Transect Survey

The first step in conducting the transect UXO detector-aided surface surveys was to identify the boundaries of the MRS. This was done using a GPS with preloaded grid coordinates. The GPS had information about the MRS preloaded so as to ensure that the path stayed within the MRS. If possible, the Trimble GeoXM or GeoXH Operators Manual was downloaded onto the operator's personal computer for reference before or while in the field.

The next step was to establish the end stakes of each transect across the MRS. The transect end stakes were established using a GPS with preloaded end stake locations. The distance between transects was established during the data quality objective (DQO) process. The direction was either north/south, or east/west. If a geophysical survey using a magnetometer was to follow the detector-aided surface sweep, the direction of the transects was usually north/south because the magnetometer operates on the principle of the Earth's magnetic polarity.

Most transects required some brush to be cut by the UXO team before the surface survey could be conducted. When brush cutting was determined to be necessary, the transects were at least 3 feet wide.

3A.2.3 Vegetation Management

At a minimum, pre-survey brush clearing (3-foot-wide paths) to allow for data collection on transects was required at most of the MRSs. Brush clearing for the UXO detector-aided surveys was needed only when a brushy section of a survey line or transect would have caused a large gap or deviation off line. Care was taken to ensure that personnel did not disturb suspect MEC items on the surface that may have been obscured by brush and tall grass.

Brush cutting and mowing of grass were required at most locations to prepare the sites for the detector-aided surface surveys and subsurface geophysics investigations. Brush cutting and vegetation clearance were conducted according to SOP OPS 6. Brush and grass can present impediments to positioning the metal detectors and geophysics detectors in close proximity to the ground surface. The degree of brush cutting/vegetation clearance was site-specific and based on the conditions at the time that the investigations were conducted. The following types of equipment/techniques were used:

- Weed wackers were used to clear light vegetation and small grassy areas.
- Mechanized lawn mowers were used to mow larger grassy areas.
- Chain saws were used in heavier brush areas and to cut small trees up to 2 inches in diameter.
- Tractor-mounted brush hogs were used in larger areas and heavier brush areas.
- Brush/vegetation cutting were left at the edge of the area cleared.

Brush cutting/vegetation clearance operations were conducted by the UXO staff.

3A.2.4 Site Accessibility, Traffic Control, and Site Security

The installation is a controlled area accessible only through an access gate. Safety considerations required that an active exclusion zone be established and maintained before any MEC activities occurred because of the potential of encountering live explosively configured/fuzed munitions. For this project, the exclusion zone was established at 200 feet for each site. If non-site personnel or non-essential non-UXO personnel entered the exclusion zone, all MEC operations ceased until the exclusion zone was re-established.

Both routine and emergency response actions required prevention of unauthorized site access and the protection of vital records and equipment. All equipment was brought to a designated secure location each day.

Site security was maintained to ensure that non-essential personnel did not access the exclusion zone during the UXO detector-aided surface surveys or other UXO avoidance operations at the sites. Barricades were positioned on access routes a minimum of 200 feet from the edge of the sites. Notification procedures were posted on the barricades to ensure that non-essential personnel notified the team working in each area prior to entering the area during active operations. Barricades were removed when operations were stopped for the day.

3A.2.5 Request for ESS Determination and NOSSA Concurrence Notification

No MEC or MPPEH were moved or disturbed during this phase of the project. A Sitewide Explosive Safety Submission (ESS) Determination Request was prepared describing the general operations planned at each site. In a letter dated November 5, 2009 (Appendix C), Naval Ordnance Safety and Security Activity (NOSSA) reviewed and determined that an ESS was not required, because MEC avoidance measures were practiced during the investigation.

MEC activities were performed in accordance with all local, state, and federal regulations, and all applicable DoD requirements including those in Engineer Pamphlet EP-75-1-2 (USACE, 2004) and DID OE 005 series (USACE, 2002). Activities involving work in areas potentially containing MEC hazards were conducted in full compliance with NSF-IH, Environmental & Munitions Center of Expertise, Military Munitions Division (CX-MM), Department of the Navy, NOSSA, and DoD requirements regarding personnel, equipment, and procedures. Navy requirements are included in OP-5 and NOSSAINST.8020.15B

This work falls under the Defense Environmental Restoration Program (DERP). The SI was performed in accordance with CERCLA Sections 104 and 121.

Extreme caution was exercised while conducting geophysical surveys on the sites which contained live munitions.

A Class A Work Approval Permit and Record of Categorical Exclusion (CATEX) was issued on November 5, 2009 (Appendix C).

Information about the surveys for the ten sites as outlined in the UFP SAP is summarized in Table 3a-1.

3A.2.6 Instrument Test Strip (ITS)

3A.2.6.1 Introduction

An ITS was developed and utilized by Tetra Tech to evaluate geophysical surveying techniques (EM61 and G-858G magnetometer) and personnel on base prior to the start of geophysical site survey work. Site-specific technical approaches and survey designs were developed for each MEC area and the Visual Sample Plan is included in Appendix B.

3A.2.6.2 Background

The specific objectives of the ITS were to:

- Demonstrate that the geophysical investigation systems and navigational equipment were operating properly.
- Provide a safe area with a known set of isolated objects for testing detection with the EM61 and G-858G equipment.
- Assess the operators' performance and update related procedures to assist in the development of operator measurement techniques.
- Evaluate average speed, minimum along track sampling, and line separation distance in detecting target items.

Evaluate detection of seed items buried within the maximum detection depth determined from the United States Army Corps of Engineers (USACE) 11x rule (typical maximum detection depth equals 11 times the diameter of the projectile munition). Seed items comprised two categories. Items that were scored or 100 percent detected, and deeper items that were used for evaluation purposes only.

The ITS and geophysical investigation were managed and performed by a qualified geophysicist who met the requirements as stated in USACE DID OE-025.01 (USACE, 2002). A UXO Technician II or higher was present throughout the ITS and geophysical investigations to provide UXO avoidance support. The UXO Technician utilized a Schonstedt GA-52 Cx to provide MEC avoidance. The Project Geophysicist in conjunction with the Tetra Tech Project Manager (PM) determined that the equipment and personnel ITS performance were acceptable, and consequently survey work began.

3A.2.6.3 Equipment And Methodology

Either the Geonics EM61-MK2 or Geometrics G-858G was used to conduct geophysical surveys in selected areas. Both instruments were tested in the Instrument Test Strip (ITS) because both are capable of detecting ferrous targets (containing iron or steel). The EM61 is also capable of detecting non-ferrous targets (copper, aluminum or brass) at survey sites where both types of metal targets may be present. Ordnance, pyrotechnics, and improvised explosive devices constructed of various types of materials were among the MEC items reportedly used or detonated in the suspect MEC areas.

Given the history of operational activities at the sites, steel targets were expected to be most common. A magnetometer was used on wooded sites, and EM61 was used on two of the open vegetation-cleared areas.

A single, man-operable instrument was employed for the surveys. The EM61 was conveyed in a standard trailer, and the G-858G was hand-carried approximately 18 inches above the ground level with two sensors spaced vertically approximately 2.25 feet apart. EM61 data were acquired at 8 readings per second, and G-858G data were acquired at 10 readings per second, while GPS data were streamed into the data at 1-second intervals.

The EM61 is an electromagnetic (EM) unit that generates a primary EM field that induces small currents to flow in the ground. A secondary magnetic field is subsequently sampled, and can be used to detect metallic objects. Above ground metallic items, where present, can also cause anomalous instrument readings, and can sometimes mask or obscure the subsurface response; this can make it difficult or impossible to determine if subsurface metal is present using the geophysical data alone.

Photograph 1: EM61 with GPS mounted on top.

A Geometrics G-858G Magnetometer (self-oscillating, split-beam, cesium-vapor, non-radioactive device) was used to collect data in a configuration that measured total magnetic field response from two vertically-spaced sensors, which allowed the magnetic gradient to be derived. Total magnetic field is the earth's magnetic field plus or minus magnetic fields from local ferrous objects near enough and large enough to the measuring sensors to be detected. The magnetic gradient is the difference in the magnetic field over a fixed distance. The magnetometer consisted of two white-colored sensors vertically spaced and deployed in front of the operator. Each sensor was connected to a control unit worn around the operator's waist that collected and stored data. Appendix D contains photographs of the magnetometer system used on the project and is shown below.

Photograph 2: G-858G magnetometer with GPS mounted above operator.

To account for, and if necessary, to correct for diurnal (daily changes) in the earth's magnetic field that could cause anomalous responses in the individual sensor data, a base station magnetometer (fixed-location magnetometer) was deployed to record data in the same location each day magnetometer survey work was performed. A Geometrics G-856 Proton Precession Magnetometer was used as the base station (see photo of survey unit in Appendix E and below).

Photograph 3: G-856 magnetometer base station.

Because the earth's magnetic field should affect both sensors in the same way, the difference in response between the sensors (vertical gradient) is indicative of metal objects within a short distance of the sensors. Vertical gradient data were judged to be best in showing results for most of the survey sites, and for those sites diurnal corrections were not deemed necessary (as data from two sensors were used together which cancels out diurnal effects). Total magnetic field data are shown in Appendix E for the Torpedo Casing Disposal Area, where the survey target was large (possible cache of torpedoes). The survey duration was short (about one hour), and setup and collection of base station data was not judged to be necessary in this case.

At all sites except the Torpedo Casing Disposal Area, GPS measurements were integrated with the geophysical data at 1-second intervals, where positional interpolation was incorporated for geophysical data recorded between GPS readings. The GPS unit was mounted above the EM sensors and above the magnetometer operator (see photos in Appendix E), At the Torpedo Casing Disposal Area, the geophysical surveying was conducted without GPS integration because of the thick tree canopy prohibited reliable and accurate GPS function. Starts and ends of survey lines at this site were surveyed in with stationary GPS readings to position the geophysical data. A sub-meter accuracy category GPS unit (Trimble Ag114 GPS) recorded positional data using OMNISTAR real-time differential corrections.

3A.2.6.4 Instrument Test Strip Location

Tetra Tech constructed a single ITS representative of the 10 MRAs investigated during this SI. Test Area 2, on the Stump Neck Annex, was selected for the location of the ITS as it was free of trees and cultural features, and could be left seeded during the project in case new equipment or a different operator needed to be tested on the plot. The test strip location was identified by Tetra Tech and approved by the Navy and Base prior to the ITS mobilization. Tetra Tech self-performed the utility clearance; a dig permit was not required in this test area because the Base used it for research and development of magnetometers, and there is a standing clearance to dig there. Based on a review of available information, and to the extent practical, Tetra Tech seeded inert items and/or surrogates of similar shape, size, and mass as the MEC items suspected to be present at the MRAs.

3A.2.6.5 Field Procedures And Results

The UXO team prepared the ITS area by starting with a detector-aided surface survey of the selected test strip location. A geophysical survey was conducted prior to seeding the test area to evaluate the instrument response of the site background. After background readings were established, geophysical

data were collected along several survey lines across the seeded test strip. An initial survey line was conducted directly overtop of the seed items (arranged in a straight line), and two more parallel survey lines were surveyed at 18 inches and 30 inches from the initial survey line on both sides of the initial survey line. The initial survey line was used to evaluate the ITS for approval (detections), and the subsequent survey lines were used for informational purposes on the lateral detection capabilities of the geophysical methods. All ITS surveying was conducted using integrated GPS.

The test strip was seeded by Tetra Tech, and the locations of the test strip, survey data stations, and test seed items were accurately documented. Depths, orientations, and physical descriptions of each of the test seed items were noted and provided to the Site Geophysicist after the targets were selected by the geophysicist to provide understanding of the seed items in relation to their resultant anomaly signatures.

Eight items were buried blind to the geophysicist in the ITS. Inert munitions and surrogate seed items expected for the sites were buried in various orientations at depths within the typical maximum detection depth of 11 times the diameter (11x D) of the munition (following the USACE 11x rule from the USACE Engineering Manual EM 1110-1-4009) where applicable. The eight seed items were buried in a straight line 6 feet apart to distinguish each item's anomaly signature and to aid in later interpretation of survey data. The items were buried in the order and depths bgs shown in Table 3a-2. Photographs of seed items can be found in Appendix E.

Data Analysis and Interpretation

The ITS activities generated geophysical contour and profile maps depicting the area surveyed and the anomalies detected. The geophysical maps were transmitted electronically and were compatible with ArcView Version 8 or the specific Geographic Information System (GIS) platform in use. Tetra Tech performed data file quality control (QC) review and correction as necessary. ITS results were reviewed and detections were confirmed for the seed items before site work began. All geophysical data were processed as soon as possible, which allowed for decisions to be made in the field and, if there were data gaps, the geophysical team could collect the data without an additional mobilization. After the geophysical data were backed up, the data were copied to the processing computer and imported into instrument specific software (manufacturer proprietary software), and then into data processing and mapping software (Geosoft-Oasis Montaj). The Geosoft software was used to process, analyze, interpret, and present the findings of the geophysical surveys using the UX-Detect® module. The processing and analysis consisted of applying standard corrections to the data, producing data profiles to help interpret the data, and identifying responses that could represent MEC. The geophysical results are presented in this report as color contour maps and anomaly target lists that depict the northing and easting locations of

individual anomalies that met the selection criteria of buried metallic items that could potentially represent ordnance items at each site. Individual anomalies were interpreted (selected) with intent to identify anomalies of potential interest, while attempting to minimize the selection of anomalies that represent noise and very small metallic objects. Noise and background levels vary from site to site and even potentially within a site. For this reason, as well as factoring in the expected sizes (masses) and expected potential depths of MEC for a particular site, different anomaly response values may have been used in interpreting different areas (that anomaly threshold or selection criteria is specified in the site specific results sections). Guidance from the anomalous responses in the ITS seed data, as well as professional experience, were also factored in to the selection criteria. Some larger areas where concentrations of anomalies were present are outlined on some of the figures. Anomalies were assigned a reference for tracking and reporting. This SI report documents the ITS results and includes an as-built drawing of the ITS plot. ITS data are presented in Appendix E.

3A.2.6.6 Equipment Calibration and QC Tests

Geophysical sensors and support equipment, and navigation equipment were inspected, set up, warmed up, and calibrated (and EM61 nulled) according to manufacturers' recommendations, and were checked and tested at specific intervals to determine if appropriate acceptance criteria were met. Sensor positions were optimized for the survey and noted, personnel and equipment were tested for the presence of interference metal so not to interfere with (negatively affect) instrument readings. All appropriate acceptance criteria were met for this project in accordance with the UFP-SAP, and further documentation/elaboration is contained in Appendix E. QC daily reports, checklists, and a copy of field notes are provided in Appendix C.

QC tests, test descriptions and results are summarized in Table 3a-3. Tests were conducted to help ensure that high quality data were collected.

3A.3 UXO DETECTOR-AIDED SURVEYS

3A.3.1 Site Set-up

- All activities involving work in areas potentially containing MEC hazards were conducted in full compliance with the UFP SAP regarding personnel, equipment, and procedures. Munitions- and ordnance-related material (including suspect MEC, MPPEH, MD, and frag), were avoided during this phase of the project. The UXO Technician did not attempt to identify the type or condition of the

ordnance. Its location was reported to the UXO team leader. MEC avoidance procedures were practiced at all times.

- The UXO escort clearly marked any area with visible ordnance or MEC, and the area was avoided. The visible ordnance or MEC was noted on the field log sheets and in the field logbook. The UXO escort reported the MEC to the UXO team leader.

- No ordnance, munitions, explosives, or ordnance-related materials were moved, removed, or disposed of during UXO escort duties.

- The UXO escort conducted a UXO avoidance survey for all proposed survey stake locations using a metal detector to check for possible ordnance or ordnance-related material. If an anomaly was encountered, or if the UXO Technician suspected the presence of MEC, the proposed stake location was relocated to an area free of concerns/anomalies.

3A.3.2 Personnel

The project manager, acting on behalf of the project team, prepared a table listing each member of the detector-aided surface survey team and subsurface geophysics team, and the required certifications and training and required demonstrations of competency. (This table is included in Appendix C.). No deviations were identified. Data collected by team members not meeting the required training and demonstrations of competency were identified. A determination was made as to whether affected data impacted the ability to meet project objectives. If the project objectives were adversely impacted, the Tetra Tech PM would have consulted with the Navy Remedial Project Manager (RPM) and other project team members, as necessary (determined by the Navy RPM), to develop appropriate corrective actions. UXO personnel conducting detector-aided surface surveys were graduates of a military EOD School of the United States, or a graduate of a formal training course of instruction or EOD assistant course as stated in DDESB TP-18. The specific personnel qualifications are detailed in Appendix A - OPS 01.

3A.3.3 UXO Detector-Aided Surface Surveys, General Methodology

A UXO surface survey was performed as site conditions required, and then a geophysical survey was executed on six of the sites to assess the area.

Data were collected in the accessible portions of the established survey areas. Detector-aided and geophysical survey data collected along transects were from a single operator using one survey

instrument, unless otherwise noted. Using a single operator and survey instrument, a survey width of 3 to 5 feet was utilized for the detector-aided surveys, which involved moving the sensor back and forth along the transect. Approximately the same survey width applied to the geophysical surveys, except that the sensor did not move in a back-and-forth motion along the survey line, and the lateral detection capability was generally dependent on the size, orientation, and depth of the buried item. Larger, shallower items could be detected further to the side of a survey line than smaller deeper items. Data station intervals were determined with the expected target sizes in mind to provide adequate sampling for the smallest expected target sizes. These intervals were normally controlled by survey speed and acquisition rate (readings per second), but may also have been controlled by a survey wheel in certain cases.

Data were collected when the ground surface was exposed, and a UXO detector-aided survey preceded geophysical surveying. Non-MEC items and surface debris were removed by the UXO Technicians to aid in the geophysical surveying effort. This avoided mapping of anomalies that were not of concern. No MEC or MPPEH were moved during this SI.

The detector-aided surveys were used to locate surface items of concern (munition items or debris), and generally provided a qualitative assessment of the amount of shallow buried metal (small, moderate, or large). Locations of surface items were collected using a GPS. The location information was stored in the GPS and entered into the field log. Geophysical data (anomalies and relative or absolute locations) were stored automatically. If GPS accuracy was not sub-meter for the geophysical surveys or the detector-aided surveys, data were not collected until more satellites were available and the accuracy criteria could be met. Gaps in the geophysical data from unusable data or data that could not be positioned were evaluated to determine whether they were sufficiently large to warrant data recollection in those areas. The UXO technician or geophysicist recorded location data and photographed other cultural features at the sites that might affect geophysical data interpretation (e.g., culverts, power lines, fencing, etc.).

Data are provided in an Appendices D and E consisting of tables and photos from the UXO survey. Descriptive data were recorded in the UXO team log book, and a copy of these data is provided in the Appendix C.

3A.3.4 UXO Detector-Aided Surface Surveys and Positioning Instruments

The metal detectors used by the UXO team during detector-aided visual surveys had a detection depth limited by size and orientation of the target and soil characteristics of the work area. These instruments provided an audio signal for response but did not store data. The magnetic locator (magnetic

gradiometer) did not need to be calibrated, but the all-metal detector did require field calibration. To ensure that each detector was operating properly, the operator turned on the instrument and slowly moved the locator towards metal. As the probe advanced toward the target, the audio signal increased. Failure to detect the object was reason to reject the instrument. Each detector was checked daily before starting MEC activities and after any battery change. UXO Technicians also conducted three random checks each day during daily operations.

The calibration setting for the Schonstedt magnetic locator instrument was 2; setting the instrument to 3 or 4 made it more sensitive, and setting the instrument to 1 made it less sensitive. The Schonstedt instrument did not detect non-ferrous munitions such as those made of copper, brass, or aluminum. The normal settings for the White's all-metal detector are presented in Appendix A - OPS 01.

3A.3.4.1 General Methodology

The UXO team members started the UXO detector-aided surface survey of each transect. Each UXO team member started at one of the end stakes, and proceeded in a deliberate pattern using the metal detector to locate any surface MEC within a 5-foot wide transect, toward the other corresponding end stake. The UXO team worked with the site geophysicist to establish transects for both the detector-aided survey and geophysical survey. Metal detectors were used to locate surface metal and debris. The UXO team member used a GPS or compass to maintain generally straight transects during the investigation. When suspect MEC/MPPEH was encountered, its location was recorded and/or marked using a GPS, tape measure, or other grid coordinate location system. The UXO Team attempted to determine its condition without moving or disturbing the item prior to proceeding with the surface survey. Each item was marked with engineer flagging and given a unique ID number starting with the transect ID label followed by the item number [e.g., VIAT-1-1 for the first transect (see Appendix A – SOP OPS 4)]. All available information about the item was recorded in the logbook/MEC Accountability Log, including suspect MEC location, identification, and ID number, and whether the item was suspect MEC or MPPEH. A digital photograph was taken of each item. The UXO Team did not move or otherwise disturb the item in an attempt to collect information. When the UXO detector-aided surface survey of a transect was complete and all items were located with coordinates and digitally photographed, the UXO team member proceeded to the next transect. This process continued until all the transects were completed over the entire MRS as planned in the UFP SAP.

Every effort was made to identify each suspect MEC item identified. Under no circumstances was suspect MEC moved in an attempt to make a definitive identification. Munitions were visually examined for markings and other external features such as shape, size, and external fittings. If unknown military

munitions were encountered, the NSF-IH IR Coordinator and Tetra Tech UXO Manager were notified. Prior to any action being performed on an ordnance item, all fuzing was definitively identified if it was possible to safely do so without disturbing the ordnance item. This identification consisted of fuze type by function and condition (armed or unarmed), and physical state/condition of the fuze (i.e., burned, broken, parts exposed/sheared, etc.).

Only UXO-qualified personnel performed MEC identification procedures. A UXO Technician I was allowed to assist in the performance of MEC identification procedures when under the supervision of a UXO Technician III or higher. All personnel engaged in field operations were thoroughly trained and capable of recognizing the specific hazards of the procedures being performed. To ensure that these procedures were performed to standards, all field personnel were under the direct supervision of a UXO Technician III or higher. All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific Health and Safety Plan (HASP), applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures.

All items discovered during the detector-aided surface survey of the transects were left in place. No MEC or MPPEH was moved during this part of the project. Detector-aided surface surveys of the established survey areas are described in the results sections for each site. The surveys were conducted by UXO Technicians, using hand held magnetic metal detectors (Schonstedt GA-52Cx), in areas where water shots were located and at the Old Shot Hole at Area 8 (UXO-2). Surveys were conducted at four parallel transects spaced 15 feet apart over numerous air shot locations. A 100 percent detector-aided surface survey was conducted of accessible areas within 50 feet of any anomaly clusters identified along transects during detector-aided surface surveys, or during the subsurface geophysical investigation. Locations where visual observations of suspect MEC, MPPEH, MD or subsurface anomalies were observed were marked with a stake. Pictures were taken of items observed on the surface. In clear areas, the locations were recorded using a GPS. In areas where tree canopy precluded use of a GPS, locations were established using a tape measure and compass measurements from a known location(s).

An underwater magnetic locator instrument was used to search and locate anomalies on the bottom of the pond area at Area 8 (UXO-2). Data were collected along parallel survey lines spaced no greater than 5 feet apart using ropes anchored to the land or buoys placed across the pond. Anomaly locations were recorded using GPS.

Information was utilized from detector-aided surveys to identify surface soil, subsurface soil and sediment sampling location areas within the footprint of the surface surveys for collection of soil and sediment samples based on the presence of MD and subsurface anomalies.

3A.3.4.2 Equipment Calibration

The equipment and calibration criteria are listed below:

- GPS – Positioning – Calibration was performed at the beginning and end of each day GPS was used. Calibration was performed by the UXO Technician (SOP OPS 5).

- Magnetic Locator – Operational - Calibration was performed at the beginning of day and after battery change. The acceptance was that it operated properly. Operational check was performed by the UXO Technician (SOP OPS 1).

- All-Metals Detector – Calibration – Calibration was performed at the beginning of each day. GPS was used to check the location of the discovered items. The acceptance was to detect inert surface segregate. Calibration was performed by the UXO Technician (SOP OPS 1).

3A.3.4.3 Quality Assurance/Quality Control

During the detector aided surface survey the senior unexploded ordnance supervisor (SUXOS)-, rechecked 25 percent of the first four units of work (grids or transects). If quality requirements were not met on any unit, that unit was rejected and the UXO team reworked the entire unit. Once quality requirements were met for four units in a row, the UXOQCS reduced the level of rechecks to 10 percent of each unit (grids or transects). If at any time a unit failed the quality control check, that complete unit was reworked and the rechecks were increased to 25 percent until four units in a row passed the recheck. The QC Logs are included in Appendix C.

3A.4 GEOPHYSICAL SURVEY

Geophysical surveys were performed by Tetra Tech in December 2009 and January 2010 to search for, and if detected, locate anomalies that could potentially represent buried MEC in the accessible portions of the specified survey areas. Geophysical data alone are not enough to determine the nature of an anomaly (i.e., whether an anomaly is munition-related material or not), but geophysical methods are capable of detecting a variety of small to large metallic objects, such as munitions. Surface geophysical methods, like those used on this project, are non-intrusive and operate by pushing or towing equipment that measures certain physical properties of the local area around the sensor, such as magnetic field strength. Detection of anomalies in these measured physical properties can suggest certain

interpretations, such as in the case of the magnetic field, the potential presence of a magnetic metallic object. All data from the geophysical surveys were analyzed, and the site data judged to best show the results are included in the figures of this report. Site-specific results are discussed later in separate sections of this report.

Geophysical survey data were collected from an operator using a single geophysical survey instrument. Approximately a 3-to 5-foot survey width was generally utilized for the geophysical surveys; however, the lateral detection capability was generally dependent on the size, orientation, and depth of the buried item in the vicinity of the survey line. Larger, shallower items can be detected farther to the side of a survey line than smaller deeper items. Data station intervals were determined with the suspected MEC sizes in mind to provide adequate sampling. These intervals were controlled by survey speed and acquisition rate (readings per second).

Geophysical data were collected when the ground surface was exposed and after a UXO detector-aided surface survey. Geophysical data anomalies and relative locations or absolute locations (only when using GPS) were stored automatically. A sub-meter accuracy category differential GPS unit was used during geophysical surveying and GPS signal reception was monitored while data were being collected using the GPS criteria specified in the SAP. During surveying, gaps in the geophysical data from unusable data or data that could not be positioned were evaluated to determine whether they were sufficiently large enough to warrant data recollection in those areas. The geophysicist was responsible for positional data for non-munitions cultural features at the site that might affect geophysical data interpretation (e.g., culverts, power lines, fencing, etc.).

Individual anomalies were interpreted (selected) with the intent of identifying anomalies of potential interest, while attempting to minimize selecting anomalies representing noise and very small metallic objects. Noise and background levels vary from site to site and even potentially within a site. Furthermore, the expected sizes (masses) and expected potential depths of MEC differ at different sites. Therefore, different anomaly response values may have been used in interpreting different areas, and so each anomaly threshold is specified in the site-specific results sections. Guidance from the lower anomalous responses in the ITS seed data, as well as professional experience were also factored into the selection criteria. Some larger areas where concentrations of anomalies were present are outlined on the Torpedo Burial and Casing Disposal Area interpretation figures. Anomalies were assigned a reference for tracking and reporting.

The geophysical surveys were managed and performed by qualified geophysicists who met the requirements stated in USACE data item description (did) OE-025.1 (USACE, 2002). Tetra Tech

performed the geophysical surveying at the sites in accordance with its sops. The details of the geophysical survey sops are outlined in Appendix A – SOP OPS 03 and SOP OPS 04.

3A.5 MEC HAZARD ASSESSMENT METHODOLOGY

The detector-aided surface survey and geophysical survey were used to establish specific locations for MC sampling. The MC UFP SAP was written to allow flexibility in establishing locations after the detector-aided surface survey and/or geophysical surveying were completed.

The decision points were defined as follows:

Any MEC, suspect MEC, MPPEH discovered on site was brought to the attention of the Navy (NSF-IH) and Tetra Tech (UXO Manager, PM and Program Management).

Any unanticipated findings that warranted modification of the UFP SAP were brought to the attention of the Project Team.

3A.6 FIELD REPORTING AND RECORDS MANAGEMENT

Tetra Tech kept the Navy updated via daily reporting and communication of on-site conditions, when MEC was encountered. Suspect MEC discovered on site was recorded in the MEC tracking log for each site and reported daily to the Navy. MEC discovered on site that presented a hazard to personnel was reported immediately to the Navy.

Project documentation was collected and managed on site during all field activities. Geophysical data, which include data from the ITS described in Worksheet #12 in the UFP SAP, were recorded digitally and downloaded periodically to a field computer for review in the field. In addition to the copy of the data saved on the field computer's hard drive, a backup copy of the data was saved before the data were erased from the equipment. The Site Geophysicist reviewed the downloaded data to verify that the download system was functioning properly and also performed a QC review of the field data. This review verified that the data were valid and useable for the intended purpose. All raw files were available on site for quality control checks to ensure that field and data processing procedures during site activities adhered to the SOP.

3A.7 MEC DOCUMENTATION

Tetra Tech established a system to record MEC located in each of the investigation areas. The SUXOS directed the establishment of this system for numbering and recording coordinates for each MEC item. Each MEC was located using a GPS to determine the northing and easting coordinates of the item. The geophysical survey team used the same coordinate and numbering system during their survey and data processing.

Field logbooks were used during each phase of the operation to record significant findings and information using the established numbering and coordinate system. A geo-referenced map of the investigation area was prepared to detail the location of each MEC item discovered. Coordinate data recorded in the field were converted, as necessary, to the North American Datum (NAD) 83/Maryland State Plane coordinates in U.S. survey feet. The UXO Technician also provided observations and recommendations for future maintenance activities, if appropriate.

Lessons learned were recorded in the site logbook and were discussed with the project field team during the next day's safety meeting, or sooner as necessary.

All data and information generated as part of the MEC investigation are included Appendix C. Appendix D includes a spreadsheet that describes the MEC finds and is hyperlinked to the individual item photo, which is presented in portable document format (pdf) on an attached CD.

3A.8 DATA USABILITY ASSESSMENT

The usability of the data directly affects whether project objectives can be achieved.

The Tetra Tech PM, Project Geophysicist, and Project Scientist were responsible for conducting the data usability assessments which were reviewed with the Navy RPM, the U.S. EPA RPM, and the state of Maryland PM.

Written documentation supported the non-compliance estimated or rejected data results. The results sections in this SI report identify and describe the data usability limitations and suggest re-surveying or other corrective actions, if necessary.

3A.9 DATA GAPS

A project scientist, identified by the Tetra Tech PM and acting on behalf of the project team, determined whether data were collected in all areas planned to be investigated. Data gaps were identified on a site-by-site basis.

TABLE 3A-1

SURVEY INFORMATION
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND
PAGE 1 OF 2

Sampling Location/ ID Number	Survey Layout	Depth (bgs)	Survey Methodology	Degree of Investigation	Exclusion Areas	SOP Name
Air Blast Pond	Grid	0 to 2 feet, depending on buried target size	Schonstedt GA-52CX or White's Spectram XLT	100-percent UXO detector-aided sweep	None (survey accessible area)	OPS 1 OPS 4 OPS 5
Area 8	Grid/ Transects	0 to 6 feet, depending on buried target size and equipment used (small to large target(s) potential)	Schonstedt GA-52CX	Varying degrees of investigation –	Various areas	OPS 2 OPS 4 OPS 5 OPS 1
EOD School Demolition Area	Grid/ Transects	0 to 4 feet, depending on target size and equipment used (small to large target(s) potential)	Geonics EM61-MK2 and Geometrics G-858G magnetometer Schonstedt GA-52CX or White's Spectram XLT	100 percent of ready bunker area (UXO detector-aided surface sweep), no greater than 5-ft-spaced lines across ready bunker area (geophysics), 50-ft-spaced transects, anomaly cluster investigation	None (survey accessible area)	OPS 2 OPS 4 OPS 5 OPS 1
Basic IED Area	Grid/ Transects	0 to 2 feet, depending on target size (small to medium target(s) potential)	Schonstedt GA-52CX or White's Spectram XLT	100 percent of former detonation area, 50-ft-spaced transects for remainder of site, anomaly cluster investigation	None (survey accessible area)	OPS 4 OPS 5 OPS 1
Advanced IED Area	Grid/ Transects	0 to 6 feet, depending on target size and equipment used (small to large target(s) potential)	Geonics EM61-MK2 Schonstedt GA-52CX or White's Spectram XLT	100 percent around SWMU 27 where accessible, 50-ft-spaced transects and anomaly cluster investigation (UXO detector-aided surface sweep)	Inside concrete foundation	OPS 2 OPS 4 OPS 5 OPS 1

TABLE 3A-1

SURVEY INFORMATION
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND
PAGE 2 OF 2

Sampling Location/ ID Number	Survey Layout	Depth (bgs)	Survey Methodology	Degree of Investigation	Exclusion Areas	SOP Name
Stump Neck Impact Area	Transects	0 to 5 feet, depending on target size (small to large target(s) potential)	Geometrics G-858G Magnetometer Schonstedt GA-52CX	40-ft-spaced transects	Aquatic areas, survey accessible areas by instrument and foot	OPS 2 OPS 4 OPS 5 OPS 1
Test Area 1	Grid	0 to 2 feet, depending on target size (small to large target(s) potential)	Schonstedt GA-52CX or White's Spectram XLT	Visual inspection of bowl, 100-percent UXO detector-aided surface sweep outside bowl	None (survey accessible area)	OPS 1 OPS 4 OPS 5
Valley Impact Area	Transects	0 to 5 feet, depending on target size (small to large target(s) potential	Geometrics G-858G Magnetometer Schonstedt GA-52CX	19 transects (400 feet apart)	Aquatic and developed areas, survey accessible area by instrument and foot	OPS 2 OPS 4 OPS 5 OPS 1
Torpedo Burial Site	Grid	0 to 6 feet, depending on target size (small to large cache of potential items)	Geometrics G-858G Magnetometer Schonstedt GA-52CX	100-percent UXO detector-aided surface sweep, and 5-ft survey line spaced geophysical survey	None (survey accessible area)	OPS 2 OPS 1 OPS 4 OPS 5
Torpedo Casing Disposal Area	Grid	0 to 8 feet, depending on target size (large target(s) potential)	Geometrics G-858G Magnetometer Schonstedt GA-52CX	100-percent UXO detector-aided surface sweep, and 10-ft survey line spaced geophysical survey	None (survey accessible area)	OPS 2 OPS 1 OPS 4 OPS 5

TABLE 3A-2

ITEMS BURIED IN THE ORDER AND DEPTHS BGS
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND

Item Description	Depth	Item Number
One 3-inch/50 projectile	22 inches bgs	ITS-01
One aluminum projectile fuze	6 inches bgs	ITS-02
One 30mm projectile	8 inches bgs	ITS-03
Ten brass cartridge cases at 18 inches bgs	18 inches bgs	ITS-04
One 20mm projectile	4 inches bgs	ITS-05
One 30mm projectile	12 inches bgs	ITS-06
One 40mm projectile	10 inches bgs	ITS-07
One 40mm projectile	16 inches bgs	ITS-08

Notes: mm – millimeter, 11x D is 11 times the diameter (USACE rule-of-thumb for maximum depth of detection)

TABLE 3A-3

MEASUREMENT PERFORMANCE CRITERIA TABLE - QC SAMPLES
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND

Data Type	Data Quality Indicator	QC Sample and/or Activity to Assess Measurement Performance	Measurement Performance Criteria	Frequency	Result
Transect	Precision	UXO Detector-Aided Surface Survey - Direct comparison to field data	Detect 20mm and larger metallic items on surface	25% on first four transects, then 10% if all transects pass QC	One transect failed early in project; retraining given all subsequent transects pass
Grid	Precision	UXO Detector-Aided Surface Survey - Direct comparison to field data	Detect 20mm and larger metallic items on surface	25% on first four grids, then 10% if all grids pass QC	Pass
GPS Positional Data	GPS Positional Accuracy	Horizontal Dilution of Precision (HDOP) and number of satellites	HDOP <3, number of satellites at least six	During field acquisition	Mixed- At times had to wait to get six satellites, and some local areas within sites had less than six satellite reception during surveying.
GPS Positional Data	Accuracy	GPS Positioning: Comparison with two known locations	Sub-meter	Twice daily or equipment change	Pass
Geophysical Data	Completeness	Data Capture	Minimize data dropouts and unusable data. 90% minimum of usable data per survey line	Daily	Pass
Instrument Test Strip (ITS)	Sensitivity	Detection capabilities test of representative seed items	Vertical Detection of seed within 11X rule (USACE) Horizontal Detection positioning between 0 and 2 feet horizontal accuracy from know location	Beginning of project, equipment change, or new operator	Pass – data presented in Appendix E.

TABLE 3A-3

MEASUREMENT PERFORMANCE CRITERIA TABLE - QC SAMPLES
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND

Data Type	Data Quality Indicator	QC Sample and/or Activity to Assess Measurement Performance	Measurement Performance Criteria	Frequency	Result
Equipment Function Test (EFT)	Sensitivity	Instrument response to metallic targets	Anomalous response to all test targets within 20% standard deviation response for each work site	Daily	Pass
Static Background and Static Spike Test	Precision	Static instrument readings (ambient and spike readings)	Acceptance criteria determined from data review. Guidance criteria: EM61:+/- 3mV, G-858G: +/-5nT, Spike: +/- 20% of standard item response	Beginning of day or equipment change	Pass

3.0B MC GENERAL METHODOLOGY

3B.1 MC SITE INSPECTION APPROACH

This section describes the sampling design, methods and documentation utilized during the MC SI field activities performed in January through March 2010 at the ten Munitions Ranges located at NSF-IH Stump Neck Annex, Maryland. All SI field work was conducted in accordance with the procedures and methodologies described in the UFP-SAP (Tetra Tech, 2009), which was approved by the U.S. EPA and the MDE (Tetra Tech, 2009). SOPs that governed the field work are listed in Appendix A of this SI Report. Sample log sheets, field documentation, site photographs, and other supporting information associated with the SI are provided in Appendices F and G of this SI Report.

3B.2 SITE PREPARATION ACTIVITIES

3B.2.1 Preliminary Activities

Following approval of the UFP SAP, Tetra Tech personnel began initial mobilization activities on January 18, 2010. NSF-IH is an active military facility. The field team members reviewed the approved UFP SAP, associated appendices, and HASP prior to the start of project activities. In addition, the Field Operations Leader (FOL) held a field team orientation meeting to ensure that personnel were familiar with the scope of the field activities. The MEC SI site activities were ongoing and were completed on February 4, 2010, when the Instrument Test Strip was removed. The MC site activities were completed on March 26, 2010.

Prior to collecting any samples at the sites, the Field Operations Leader (FOL) arrived at NSF-IH Stump Neck Annex, Maryland and began on-site mobilization activities. Mobilization activities included the receipt of field equipment directly from vendors. Each piece of equipment was checked upon receipt to verify that it was provided in proper working condition. Daily safety meetings were held each morning by the FOL and a UXO representative to briefly address the day's planned activities. A UXO representative was present during all field activities.

3B.2.2 Utility clearance

The utility clearance, in the areas where DPT for MC subsurface sampling was required, was performed by a Tetra Tech subcontractor. Enviroscan completed a utility clearance of the investigation area guided by use of site utility maps and a Radiodetection RD4000-series pipe and cable locator. Enviroscan

arrived onsite on February 3 and 4, 2010, cleared the locations where samples were to be collected at a distance of 10 feet around each location, and marked all utilities with pin flags. The subcontractor was escorted throughout the site by a UXO technician. A utility clearance and/or Dig Permit were requested from the Navy prior to conducting ITS operations, which is included in Appendix F.23. Six of the sites, UXO-1, UXO-2, UXO-4, UXO-5, UXO-12, AND UXO-23, required clearance because subsurface soil samples were collected and monitoring wells installed using DPT. Utility clearance was required at the locations where these activities were conducted. Figures were provided to the utility locater, showing the general areas where these samples were to be collected.

The actual sampling locations were contingent on the clearance of utilities/structures and were adjusted in the field as necessary. A total of 91 sample locations required utility clearance. The DPT rig was mobilized on one occasion.

Prior to commencing any work at the Stump Neck Annex, the Comprehensive Work Approval Process (CWAP) was followed. The CWAP identified constraints in the work area, such as the locations of eagle's nests, archeological sites, wetlands, etc., that may have affected work at the site, and other requirements that had to be met prior to commencing work, such as locating underground utilities, etc. Upon completion of the CWAP, a Dig Permit was issued to the utility contractor. The FOL coordinated with facility personnel and with a Tetra Tech subcontractor to arrange for the utility clearance of all soil boring locations. Utilities that were not shown or were incorrectly located were marked on the permit, and the marked-up permit was returned to the Indian Head Stump Neck point of contact (POC) for inclusion in the Activity GIS.

The following underground utilities were located in the investigation area as shown on the Class A Work Permit included in Appendix F.23:

- Electric
- Gas
- Potable Water
- Sanitary Sewer
- Storm Sewer
- Telephone/ Communication

3B.2.3 Vegetation Management

Brush cutting and vegetation clearance were conducted according to SOP OPS 06. The degree of brush cutting/vegetation clearance was site-specific and based on the conditions at the time that the investigations were conducted. The types of equipment and techniques that were used are discussed in Section 3a.2.3.

The majority of the brush cutting/vegetation clearance operations were conducted by the UXO staff during the MEC SI. During the MC SI, if it was necessary to utilize subcontractors, a UXO escort was provided during subcontractor brush/vegetation clearance operations. The amount of clearing required at each of the ten MRP sites to facilitate sampling activities varied. A brief discussion on vegetation clearing requirements is discussed in the ten site-specific sections of the SI report.

3B.2.4 Site Accessibility, Traffic Control, and Site Security

The installation is a controlled area accessible only through an access gate. If non-site personnel or non-essential non-UXO personnel entered the exclusion zone, all MC operations ceased until the exclusion zone was re-established.

Both routine and emergency response actions required prevention of unauthorized site access and the protection of vital records and equipment. All equipment was brought to a designated secure location each day.

3B.2.5 Permitting (access/drilling/etc)

All personnel were required to have security clearance for site access. All on-site personnel presented proof of United States Citizenship (i.e., Birth Certificate or Passport), photo identification card, vehicle registration information, and proof of automobile insurance before entry to the facility was allowed. A Class A Work Approval Permit and Record of CATEX was issued on November 5, 2009 (Appendix F.23).

3B.2.6 ESS Determination and NOSSA Concurrence Notification

No MEC or MPPEH were moved or disturbed during this phase of the project. A Sitewide ESS Determination Request was prepared describing the general operations planned at each site. In a letter dated November 5, 2009 (Appendix F), NOSSA reviewed and determined that an ESS was not required, because MEC avoidance measures were practiced during the investigation and a UXO technician was present during all field activities.

3B.2.7 GPS

Prior to field mobilization, all GIS grade sample coordinates were uploaded into a hand-held GPS unit capable of sub-meter accuracy (i.e., Trimble GeoHX). The GPS was then used in the field to locate all sampling points. The GPS coordinate system was set up so that all data points were collected in North American Datum of 1983 (NAD83) Maryland State Plane coordinates in US survey feet. Calibration was performed by the FOL.

Upon locating the sample points with the GPS, the locations were marked with a brightly colored pin flag with the sample ID written on each flag. Once all the samples were collected at a site, the field team then marked each sample location with a short length of polyvinyl chloride (PVC), and the pin flags were removed. The top 1 to 2 inches of the PVC marker was spray painted with highly visible orange paint. In locations that were not maintained (i.e., mowed), the PVC was allowed to extend approximately 12 inches above the ground surface. For sample locations in areas which were manicured, the PVC was driven nearly flush with the ground surface. The PVC was used as a semi-permanent aide for future location of sampling points.

Once all samples at a site were collected, a field team member returned to each individual sample location and updated the GPS coordinates by collecting actual sample location coordinates. GPS coordinates were collected at each location for a minimum of 1 minute during periods when satellite reception was optimal (i.e., greater than six available satellites). Each evening, when sample locations were updated with the GPS, the coordinates were transferred from the GPS unit to a personal computer via Microsoft ActiveSync and Trimble Data Transfer Utility. The data were then uploaded to the Naval Facilities Engineering Service Center Tetra Tech electronic MMRP Data Depository. This transfer allowed for a GIS Technician to perform a differential correction which calculated correction factors for each data point and report more accurate coordinates. The GIS Technician then produced a site figure with the corrected GPS data and placed it in the MMRP Data Dictionary, which was available to the FOL. This entire process was typically completed in a 24-hour period, and allowed the FOL to retrieve the sample location figure for each site while still in the field to determine if the GPS coordinates appeared correct in relation to site features.

3B.3 FIELD INVESTIGATION METHODS

A total of 527 soil, 9 sediment, 1 surface water, and 9 groundwater samples were collected by hand auger (HA), DPT, plastic trowel (PT), or ponar dredge (PD) at 181 soil boring, 9 sediment, 9 groundwater, and 1 surface water sample locations during the SI investigation.

This section describes sampling locations, methods, and rationales for the sampling activities conducted in support of the field investigations at the ten munitions response sites located at the NSF in Indian Head, Maryland. The SOPs are included in Appendix D of the approved UFP SAP and are listed, but not included in Appendix A of this report.

The soil samples were collected via hand auger in accordance with SOP-05 or DPT in accordance with SOP-06. To determine the vertical extent of any surficial contamination, surface soil samples were collected at both 0- to 6-inch and 0- to 24-inch bgs depths. Typically, subsurface soil samples were collected from 2 to 4 feet and 4 to 6 feet bgs, unless refusal occurred or the water table was encountered. The subsurface samples were a vertical composite of the entire length of the 2-foot sample core (although taken from one discrete horizontal location) unless unusual staining or odor was observed in the core; in those instances, the sample was collected from that specific area of the sample core.

All sediment samples were collected from 0 to 6 inches bgs in accordance with SOP-08. Surface water samples were collected in accordance with SOP-07, and groundwater samples were collected in accordance with SOP-18.

Prior to any field activities, the Tetra Tech FOL ensured that all field personnel read and understood the UFP-SAP and the associated HASP, and that all non-health and safety-related equipment was available and operational. The site safety officer (SSO) ensured that all health and safety-related equipment was available and operational.

The sampling objective was to determine if past operations have led to any possible contamination at each respective site. Samples were analyzed for explosives, VOCs, and metals in soil, sediment, surface water, and groundwater. Three of the soil samples per site (one from each sample interval) were also selected for CEC, TOC, and pH analysis. No samples were proposed for collection at the Valley Impact Area (UXO-26). All field visual observations were recorded on sample log sheets. Any encounters with metallic objects or other objects that indicated a potential contaminant source or hazard were reported to the FOL and SSO, and appropriate actions were taken as specified in the UFP-SAP and associated HASP.

If MEC was observed in any boring sample or near any work area, work was halted. The presence of MEC was communicated to the FOL, and the FOL then communicated with the NSF-IH POC so that the appropriate action was taken. If obvious soil staining was observed in any boring, the staining was described in the boring log, and additional samples were collected at the discretion of the FOL or site geologist to determine the nature and possibly the extent of associated site-related contamination.

Sampling Strategy

The chosen sampling strategies for each of the ten areas investigated are detailed below. Each sampling strategy employed a transect line sample design to target those areas that were most likely to be contaminated according to the CSMs presented in Appendix B of the UFP SAP, as well as nearby areas that helped to bound the contamination. The data collected under this conservative strategy probably do not represent the concentrations to which human or ecological receptors would actually be exposed. Instead, the measured concentrations are likely greater than actual exposure concentrations. The strategy, therefore, ensures that a potential environmental problem is not overlooked. Sampling locations were selected to ensure good spatial coverage of the targeted contamination areas, and to validate the sampling design and CSMs; samples were also collected from outside of expected contamination areas. If the CSMs were correct, these additional locations would have exhibited lower, and perhaps even non-detectable, concentrations of MC than those found in the targeted contamination areas. Additional sampling strategies are discussed in each individual site section. All soil borings were logged to determine lithology.

The actual sample locations sometimes varied from the proposed locations based on field conditions; however, samples were collected from each MRA as depicted on the sample location figures in the individual site sections of the report. The FOL used his/her professional judgment and the results of the MEC investigations of the sites to determine which areas were most likely to be contaminated, and adjusted the proposed sample locations accordingly.

The total numbers of soil, sediment, surface water and groundwater analyses for each analyte group are summarized in Section 3b.6. All samples collected for fixed-base laboratory analyses were prepared and analyzed according to the normal laboratory protocol as identified in the UFP SAP.

All sample locations were marked with a wooden stake or brightly colored pin flag indicating the sample location. Coordinates were determined by GPS (SOP-22) at each individual sample location which allowed for future repeatable investigations or to guide in any remedial action. All sample location

markers were removed prior to the final demobilization. The table 3B-1 show the types of samples collected for each site:

Upon completion of all SI activities, sample location pin flags were removed from the sites, work areas were thoroughly cleaned, and trash was bagged and disposed in the trash dumpster outside the field office (IDW disposal is discussed in Section 3b.3.8.) The FOL then shipped the equipment back to the third party vendor, and the field crew demobilized from the site. The ten MRP sites are summarized in the Site Summary Table (Table ES-1).

3B.3.1 Hand Auger

During this field event, surface soil samples were collected with hand augers in accordance with SOP-05 (Appendix D of UFP-SAP).

The hand auger system consisted of a stainless steel bucket bit (i.e., cylinders 6.5 inches long and 2.75 inches in diameter), a 3- or 4-foot extension rod, and a cross handle. A properly decontaminated bucket bit was attached onto a clean extension rod, and then onto the cross handle. The area sampled was cleared of any surface debris (i.e., leaves, twigs). The hand auger was turned into the ground to an initial depth of 6 inches. The auger was then removed and the sample material was placed into a Ziploc bag. The sample ID, date, time, and depth were marked on the bag with an indelible marker. The auger was then returned to the boring hole and sample material was removed and placed into a separate Ziploc bag until reaching the final depth of either 6 or 24 inches bgs. Again, the sample ID, date, time, and depth were marked on the bag with an indelible marker. Required information was completed on the Soil Sample Log Sheet and the chain-of-custody form. Excess soil core material was returned to the hole and tamped. If insufficient soil was available to fill the hole to the ground surface, then clean sand was used to “top off” the bore hole. All soil sampling equipment was decontaminated between sample locations in accordance with SOP-04 (Appendix D of UFP-SAP) and as explained in Section 3b.3.7.

The sample labels were completed and affixed to the sample containers. Samples were packaged and shipped to the FBL in accordance with SOP-11 (Appendix D of UFP-SAP). Field Forms are attached in Appendix F and include the Soil and Sediment Sample Log Sheet and the Soil Boring Log Sheet, where applicable.

3B.3.2 Composite Surface Sampling

Performance of multi-increment (MI) sampling utilized the "wagon wheel" approach with a central "hub" sample and six or more "spoke" samples in a wheel-like pattern. The lengths of the "spoke" segments from the hub were approximately 10 feet each.

Surface soil samples at each location sampled were composites of seven discrete samples collected using the seven-point wheel approach. Explosives present on the surface would have resulted from low order detonations which released particles of explosives. These particles would be heterogeneously distributed in surface soil. In order to form a composite in which explosives would be evenly dispersed, the entire composite was processed in the laboratory using the methodology described in Appendix A of SW-846 Method 8330B. This methodology consists of air drying and sieving the entire sample and conducting particle size reduction (grinding) of the entire sample.

3B.3.3 Direct Push Technology (DPT)

SOP-06 (Appendix D of UFP-SAP) describes the procedures for collecting surface and subsurface soil cores from unconsolidated overburden materials using Direct-push technology (DPT). DPT was employed to collect soil cores. DPT refers to sampling tools and sensors that are driven directly into the ground without the use of conventional rotary drilling equipment. DPT typically utilizes hydraulic pressure and/or percussion hammers to advance the sampling tools. Geoprobe® is a manufacturer of a hydraulically powered, percussion/probing machine utilizing DPT to collect subsurface environmental samples. This type of rig with a Macrocore Sampler was used at the Naval Support Indian Head Stump Neck Annex to collect soil cores.

The area was cleared of any surface debris. A new clear acetate liner was placed in the detachable Macrocore core barrel and a coring device was attached to the Geoprobe rig. Macrocore samplers (lined with acetate) were driven into the ground to a specified depth using hydraulic pressure. The 0- to 2-foot bgs depth soil interval was considered to be the surface soil. Subsurface soil samples were collected at depths greater than 2 feet bgs. The sampler was retracted from the borehole, and the acetate liner and the soil core were removed from the Macrocore barrel. The acetate liner containing the soil core was placed in a metal trough, and the acetate liner was cut through its entire length. The soil core was logged on the Boring Log Sheet SOP-10 (UFP SAP) and the desired interval of the soil core was placed in a sealable polyethylene bag. The sample material was thoroughly homogenized, and the sample ID, date, and time were written on the bag with an indelible marker. The required information was completed on the Soil Sample Log Sheet, and the chain of custody (COC) Form was updated. These steps were

repeated for the next depth intervals, if required. The depth to water table, if encountered, was recorded on the Boring Log, and the estimated moisture content of the soil and the presence or absence of water in the boring were noted. All soil core materials were returned to the hole if no readings above background were recorded on the photoionization detector (PID) were recorded. If insufficient soil was available to fill the hole to the ground surface, then bentonite pellets mixed with the soil were used to backfill the hole, and hydrated as per manufacturer recommendations. All soil sampling equipment was decontaminated in accordance with SOP-04 (Appendix D of UFP-SAP) prior to collecting the next sample. The sample labels were completed and affixed to the sample containers. Samples were packaged and shipped to the FBL in accordance with SOP-11 (Appendix D of UFP-SAP). Field Forms are attached in Appendix F and include the Soil and Sediment Sample Log Sheet and the Soil Boring Log Sheet, where applicable.

3B.3.4 Temporary Monitoring Well Installation

At Area 8 (UXO-02) selected borings were converted into temporary monitoring wells in accordance with SOP-16 (Temporary Monitoring Well Installation and Abandonment). Methods for recording data are included in each SOP. During temporary groundwater monitoring well installation, a portion of the surface and subsurface soil samples (described above) were collected from well borings to characterize the nature of surface and subsurface soil at the well locations. The following procedures were used for DPT installation. The temporary well was installed by driving a nominal 2-inch ID drill casing (with an expendable tip) to the desired depth. After the casing was advanced to approximately 8 to 9 feet below the water table or to the first water bearing zone, a 10-foot-long screen attached to the riser pipe was lowered to the bottom through the casing. The casing was then withdrawn from the ground, exposing the PVC screen to the formation material. The saturated formation material potentially collapsed around the screen, and the remaining annular space around the screen was filled with silica sand to at least 1 to 2 feet above the screen. A bentonite seal was then installed to the ground surface completing the temporary well construction. Well construction details are included in Appendix F.15.

3B.3.5 Groundwater Sampling

Six groundwater samples were collected from three existing and three newly installed temporary monitoring wells at Area 8 (UXO-02) and three existing monitoring wells at the Basic IED Area (UXO-04). The locations of the temporary wells were determined based on the results of the detector-aided surface sweeps and the subsurface geophysical investigation. Wells were placed in locations where the presence of anomalies indicates the potential for release of MC. Factors considered were the density of the anomalies, distances from existing wells, groundwater flow direction and MC data (if available). Groundwater samples were analyzed for explosives (SW 846 Method 8330B) and metals (SW 846

Method 6010B/6020A) and additionally, VOCs (SW 846 Method 8260B) at the Basic IED Area (UXO-04) only. For groundwater samples, both total and dissolved metals were analyzed to determine the potential influence of suspended particulates on metals concentrations in groundwater. The groundwater samples were filtered through a 0.45-micron filter if low-flow sample collection did not result in turbidity of less than 10 nephelometric turbidity units (NTUs) to obtain data on dissolved metals. An F was placed at the end of the sample ID to indicate that sample has been filtered, for example, X02GW001F.

Groundwater samples were collected from the monitoring wells after the wells were inspected (Appendix F.14) and redeveloped. A static water-level measurement was obtained (SOP-13) of the well to be purged. Groundwater samples were collected in accordance with SOP-17 (Low-Flow Well Purging and Stabilization) and SOP-18 (Groundwater Sampling). The groundwater sample log sheets for UXO-02 are included in Appendix F.11. The groundwater sample log sheets for UXO-04 are included in Appendix F.12.

The equipment used for well development and groundwater sampling was as follows: 12vdc submersible pump, peristaltic surface pump, multi-parameter water quality meter, water level meter, water containers, sample containers.

The well development and groundwater sampling procedures were as follows:

1. Obtain the total depth of the well by measurement.
2. Using the static water level determined with a water level meter, the total depth of the well and the screen length, calculate the saturated screen length well casing volume using the following formula:

$$V = (0.163)(T)(r_2)$$

where: V = Static casing volume of well (in gallons).
T = Vertical height of water column (linear feet of water) across the screen interval.
0.163 = A constant conversion factor that compensates for the conversion of the casing radius from inches to feet, the conversion of cubic feet to gallons, and pi.
r = Inside radius of the well casing (in inches).

Note: For wells of 1-inch radius (2-inch diameter), V = 0.163 gallons per foot of water column. The minimum purge volume should be two saturated screen lengths.

Wells were purged using either a submersible bladder pump or surface peristaltic pump. For wells with a nominal ID of 1-inch the peristaltic pump was used to purge and sample the well.

If the depth to water level exceeds the capacity (about 25 ft to water) of the peristaltic pump then a submersible bladder pump was used to purge and sample the well.

3B.3.6 Sediment Sampling

SOP-08 (Appendix D of UFP-SAP) establishes the procedure for sediment sampling in streams and other waterways. A sediment sample was collected at the drainage channel at the Torpedo Burial Site (UXO-12) at the downstream end location and a second sediment sample was collected approximately 70 feet farther to the north at the drainage channel. Seven sediment samples were collected at the pond area of Area 8 (UXO-02).

Vegetative matter or debris, if present, was cleared from the sample location using a disposable sampling trowel or dedicated stainless steel spoon. The trowel was used to collect and homogenize the sediment in an 18-inch-diameter circular area that was 6 inches deep. The sediment was stirred within the circular area, and the sediment was not moved outside the circle. The same trowel was used to scoop the homogenized sediment into a Ziploc-type baggie. The sample ID, date, time, and sampler initials were written on the bag with an indelible marker. Required information was completed on the Sediment Sample Log Sheet and the COC Form was updated. The sample labels were completed and affixed to the sample containers. Samples were packaged and shipped to the FBL in accordance with SOP-11 (Appendix D of UFP-SAP). Field Forms are attached in Appendix F and include the Soil and Sediment Sample Log Sheets.

3B.3.7 Surface Water Sampling

SOP-07 (Appendix D of UFP-SAP) establishes the procedure for surface water sampling in streams and other waterways. A surface water sample was collected at the drainage channel at the Torpedo Burial Site (UXO-12) at the downstream end location.

While standing downstream or from the bank, any floating leaves or twigs, that were present in a sample pool area, were removed in a manner that would not disturb the bottom sediment. While standing downstream or from the bank, the sample container was placed in the water at the sampling location at a 45-degree angle and lowered to approximately half the sample pool depth. With the mouth of the

container facing upstream, the container was filled with water, while being careful not to disturb the sediment. The sample was collected into a certified-clean, pre-preserved bottles (if preservation was required for the analysis to be performed) supplied by the laboratory performing the analyses. Sample containers were not filled completely; a small amount of air should was left at the top. The date and time that the sample containers were filled on the Surface Water Sample Log was recorded on the sample sheet, the sample labels, and the Chain-of-Custody Form. After the sample label was completed and checked, the sample container was placed into a sealable polyethylene bag and the plastic storage bag holding the sample container was placed into a cooler containing ice. A peristaltic pump for filtering of the dissolved metals samples was used. Using new, clean, disposable silicone tubing and a 0.45-micron filter, the intake tubing from the pump was placed into the transfer bottle with the filter attached to the discharge end and start the pump. The filter was filled with approximately 50-mL of sample water prior to filling the sample containers. Using the discharge from the filter cartridge, one 1-liter polyethylene sample bottle for dissolved metals was filled. Measurements of dissolved oxygen, pH, specific conductance, temperature, turbidity, and oxidation-reduction potential using the multi-parameter water-quality meter and LaMotte Turbidity Meter were obtained (see SOP-12 of the UFP SAP) . The readings were recorded in the appropriate fields on the Surface Water Sample Log Sheet.

3B.3.8 Field Sample Documentation

The sample numbering scheme was in accordance with SOP-02. Sample documentation consisted of the completion of sample log sheets, COC forms, field logbooks, and health and safety documentation. Field documentation was completed as per SOP-03. The sample log sheets contain information such as sample location and sample identification number; container requirements and analyses to be performed; and sample type, time, and date. Any unusual circumstances encountered during sample collection were noted on the form. COC forms were used to track each sample from collection to receipt at the FBL. All field log sheets and field forms are included in Appendix F of this document. Site photographs are included in Appendix G.

Sample labeling was in accordance with SOP-01. Soil sample log sheets maintained for the samples collected during the MC phase of this SI are included in Appendix F and contain the following information, as appropriate, for each sample:

- Sample location and sample ID.
- Name of person(s) collecting the sample.
- Sample collection method.

- Sample depth, date, and time.
- Brief soil description.

Sample Handling, Packaging, and Shipping

Sample containers, preservation, packaging, and shipping were in accordance with SOP-11. Sample handling activities included field-related considerations concerning the selection of sample containers, allowable holding times, sample custody, and maintaining samples at the appropriate storage temperature. All sample containers shipped to the FBL were sealed in plastic ziploc-type bags to minimize the possibility of breakage during transport. The sample containers were placed in a cooler lined with a large plastic garbage bag and covered with ice. A temperature blank was placed in each cooler prior to shipment. The plastic garbage bag was sealed with a knot, and the COC form was sealed in a ziploc-type bag and taped to the inside of the cooler lid. A signed and dated custody seal was applied to each end of the cooler and then covered with strapping tape to provide a tamper-evident seal. A Federal Express airbill was applied to the shipping cooler. Tetra Tech maintained custody of the samples until they were relinquished to Federal Express. The Federal Express tracking number (airbill number) was recorded on the COC form, and the sender's copy of the airbill was maintained for shipment tracking, if needed. All samples were shipped to the FBL for overnight delivery and were received within sample holding times.

3b.3.9 Quality Control Samples

Quality assurance (QA)/QC samples were generated and collected during sampling activities to monitor both field and laboratory procedures, in accordance with the approved WP (Tetra Tech, 2009). QA/QC samples included field duplicates, equipment rinsate blanks, and temperature blanks. Field duplicate results are tabulated in Appendix H of this document. Types of QA/QC samples are briefly described below.

- Field Duplicates - consisted of a single sample split into two portions. Field duplicates were collected at the rate of 1 in 20 during this field investigation to assess the overall precision of the sampling and analysis program.

- Equipment Rinsate Blanks - obtained under representative field conditions by collecting the rinse water generated by running analyte-free water through or over sample collection equipment after decontamination and before use. Equipment rinsate blanks were analyzed for the same chemical constituents as the associated environmental samples.

- Temperature blanks - used to determine if samples were adequately cooled during shipment. Temperature blanks consisted of analyte-free water supplied by the FBL. One temperature blank was submitted to the laboratory in each cooler, and the temperature was checked upon receipt at the laboratory.

QA/QC samples were generated and collected during sampling activities to monitor both field and laboratory procedures, in accordance with the approved UFP-SAP (Tetra Tech, 2009). QC for the x-ray fluorescence (XRF) analyzer included analyzing known National Institute of Standards and Technology (NIST) standards, a blank sample, and a known "clean" sample.

3B.3.10 Decontamination Procedures

Non-dedicated, non-disposable equipment (e.g., hand augers) involved in field sampling activities was decontaminated before beginning work, between sample locations, and at the completion of field activities in accordance with SOP-04.

The following decontamination steps were taken:

- Wash with potable water and phosphate-free detergent (scrub if necessary)
- Rinse with potable water
- Rinse with deionized (DI) water
- Air dry (if possible)
- Wrap in aluminum foil (if not used immediately)

Reusable (non-dedicated) sampling equipment (e.g., hand augers) was decontaminated prior to beginning sampling and between sample locations. Two 5-gallon buckets, a scrub brush, and deionized (DI) water were utilized in the decontamination process. Each bucket was filled with approximately 2 to 3 gallons of clean water. One bucket then received a small amount of phosphate-free detergent (Liqui-Nox) which was mixed into the water. Prior to sample collection, and between sample locations, the auger bit was placed in the water/detergent mix and scrubbed clean. The auger was then transferred to the second bucket for a clean rinse. The auger then received a final rinse with DI water. If the auger was not immediately used it was wrapped in clean aluminum foil.

At the conclusion of SI field activities, the FOL completed final decontamination of all equipment, which was then shipped back to the appropriate vendor(s).

3B.3.11 Investigation-Derived Waste

IDW consisted of decontamination fluids, paper towels, pin flags, and personal protective equipment (PPE). IDW was handled in accordance with SOP-09.

All soil removed from a sample location that was not used as part of that sample was returned to its original boring.

PPE – All PPE was double bagged and placed in Base trash receptacles (i.e., dumpsters).

Sampling Equipment Decontamination Fluids – Equipment decontamination fluids were retained by Tetra Tech in a 55-gallon drum that was labeled, sealed, and temporarily stored at Stump Neck Annex Base. A composite sample was collected from the container and submitted to the FBL for metals analysis for determination of disposal requirements. Analytical results are included in Appendix H.

3B.3.12 Site Management and Facility Support

The FOL was designated as the lead in coordinating all day-to-day activities during the investigation. The FOL was responsible for ensuring that the field team members (including subcontractors) were familiar with the approved UFP SAP and the HASP in effect during this field investigation. Additionally, the FOL was responsible for all sampling operations, QA/QC, field documentation requirements, and field change orders. The FOL reported to the PM on a daily basis regarding the status of fieldwork.

SI records including daily activity logs, sample log sheets, and COC forms were completed in accordance with SOP-03. Information recorded daily included field activities, weather conditions, identity and arrival and departure times of personnel, management issues, etc. Copies of daily activity records from the MC phase of the SI are included in Appendix F.

3B.3.13 Record Keeping

SI records including daily activity logs, sample log sheets, and COC forms were completed in accordance with SOP-03. Information recorded daily included field activities, weather conditions, identity and arrival and departure times of personnel, management issues, etc. Copies of daily activity records are included in Appendix F. Tetra Tech kept the Navy updated via daily reporting and communication of on-site conditions. Suspect MEC discovered on site was recorded in the MEC tracking log for each site and reported daily to the Navy. MEC discovered on site that presented a hazard to personnel was reported

immediately to the Navy. In the event that adverse weather conditions existed or a change in site conditions was identified, Tetra Tech notified the Navy immediately.

3B.4 ANALYTICAL METHODOLOGY

Analytical Tasks - Chemical analyses for explosives, metals, and VOCs were performed by the subcontracted laboratory, Analytical Laboratory Services, Inc. (ALSI). ALSI is Naval Facilities Engineering Service Center (NFESC) approved and National Environmental Laboratory Accreditation Program (NELAP) accredited. Analyses were performed in accordance with the analytical methods identified in Worksheet #30 of the UFP SAP. ALSI met the project quantitation limits (PQLs) specified in Worksheet #15 of the UFP SAP. ALSI performed the chemical analyses following laboratory-specific SOPs (Worksheets #19 and #23 of the UFP SAP).

Laboratory Explosives Preparation Procedure - Where appropriate, solid matrix environmental samples were collected using a multi-increment sampling method. After drying, mixing, and sieving of the composited sample material to be analyzed, a sample aliquot was removed for metals analysis (prior to grinding of the sample). This process reduced the potential for metals analyses being biased as a result of the reduced particle size and the increased total surface area that is available for leaching. The sample portion to be analyzed for explosives via SW-846 Method 8330B was ground to the required size for this method.

Data Handling and Management - After the field investigation was completed, the field sampling log sheets were organized by date and media and filed in the project files. The field logbooks for this project were used only for these sites, and were categorized and maintained in the project files after the completion of the field program. Project personnel completing concurrent field sampling activities maintained multiple field logbooks. When possible, logbooks were segregated by sampling activity. The field logbooks were titled based on date and activity. The data handling procedures followed by the laboratory met the requirements of the technical specification. The electronic data results were automatically downloaded into the Tetra Tech database in accordance with proprietary Tetra Tech processes.

Data Tracking - Data were tracked from generation to archiving in the Tetra Tech project-specific files. The Tetra Tech Project Chemist (or designee) was responsible for tracking the samples collected and shipped to the contract laboratory. Upon receipt of the data packages from the analytical laboratory, the Project Chemist oversaw the data validation effort, which included verifying that the data packages were complete, and that results for all samples had been delivered by the analytical laboratory.

Data Storage, Archiving, and Retrieval - The data packages received from the subcontracted laboratory were tracked in the data validation log book. After the data were validated, the data packages were entered into the Tetra Tech CLEAN file system and archived in secure files. The field records including field log books, sample logs, chain-of-custody records, and field calibration logs were submitted by the FOL and entered into the CLEAN file system prior to archiving in secure project files. The project files are audited for accuracy and completeness. At the completion of the Navy contract, the records will be stored by Tetra Tech.

Data Security - The Tetra Tech project files are restricted to designated personnel only. Records can only be borrowed temporarily from the project file using a sign-out system. The Tetra Tech Data Manager maintains the electronic data files. Access to the data files is restricted to qualified personnel only. File and data backup procedures are routinely performed.

3B.5 DATA QUALITY REVIEW

3B.5.1 Data Quality Review

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for the Air Blast Pond were of acceptable quality for use in decision-making. The review began with data validation, which is a comparison of data quality indicators (DQIs) against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as “U,” “J”, “R,” “L”, “K”, or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the data quality objectives (DQOs) of the project.

3B.5.2 Data Validation Process

All of the results from analytical laboratory samples were validated according to multiple specifications. Sample data validation generally followed U.S. EPA Region III Modifications to the National Functional Guidelines for Organic Data Review (September 1994), and U.S. EPA Region III Modifications to the National Functional Guidelines for Inorganic Data Validation (April 1993) guidelines.

Data validation specifications require assignment of data qualifiers in response to various data deficiencies. Validation specifications also require data qualifiers be applied to results that are reported as being less than the detection limit. The flags used for data qualification are as follows:

- U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

- UJ – Indicates that the chemical was not detected; however, the detection limit (sample-specific detection limit) is considered to be estimated based on problems encountered during laboratory analysis. The associated numerical detection limit is regarded as inaccurate or imprecise.

- J – Indicates that the chemical was detected; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is considered to be an estimate of the true concentration.

- K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

- L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

- UR – Indicates that the chemical may or may not be present. The non-detected analytical result reported by the laboratory is considered to be unreliable and unusable. This qualifier is applied in cases of gross technical deficiencies (e.g., holding time missed by a factor of two times the specified time limit, severe calibration non-compliance, and extremely low analyte recovery).

- R – Indicates that the chemical may or may not be present. The positive analytical result reported by the laboratory is considered to be unreliable and unusable. This qualifier is applied in cases of gross technical deficiencies.

The preceding data qualifiers may be categorized as indicative of major or minor problems. Major problems are defined as issues that result in the rejection of data and qualification with UR or R qualifiers. These data are considered invalid and are not used for decision-making purposes unless they are used in a qualitative way and the use is justified and documented. Minor problems are defined as issues resulting in the estimation of data and qualification with "U", "J", and "UJ" qualifiers. Estimated analytical results are considered to be suitable for decision-making purposes unless the data use requirements are very stringent and the qualifier indicates a deficiency that is incompatible with the intended data use. A "U" qualifier does not necessarily indicate that a data deficiency exists because all non-detect values are flagged with the "U" qualifier regardless of whether a quality deficiency has been detected.

3B.5.3 Data Validation Outputs

After data were validated, a list was developed of non-conformities requiring data qualifier flags used to alert the data user to inaccurate or imprecise data. The reviewer then prepared a technical memorandum presenting qualification of the data, if necessary, and the rationale for making such qualifications (See Appendix I). The net result was a data package that had been carefully reviewed for its adherence to prescribed technical requirements. Pertinent quality estimates are summarized in a more quantitative format in the following Section.

3B.5.4 Data Quality Review

DQIs are parameters monitored to help establish the quality of data generated during an investigation. Some of the DQIs are generated from analysis of field samples (e.g., field duplicates) and some are generated from the analysis of laboratory samples (e.g., laboratory duplicates). Individually, field and laboratory DQIs provide measures of the performance of the respective investigative operations (field or laboratory). During data validation, individual QC results were evaluated. If individual QC results were acceptable, no validation flag was assigned to an analytical result; otherwise, a flag indicating the type of QC deficiency was assigned to the result.

3B.5.5 Completeness

Completeness is a measure of the number of valid samples or measurements that are available relative to the number of samples or measurements that were intended to be generated. For this project, completeness was measured on two different bases:

- Samples collected - measure of the usable samples collected compared to those intended to be collected.

- Laboratory measurements - measure of the amount of usable valid laboratory measurements per matrix for each target analyte.

Usable valid samples (or results) were those judged, after data assessment, to represent the sampling populations and to have not been disqualified for use through data validation or additional data review. Completeness was determined using the following equation:

$$\%C = \frac{V}{T} \times 100$$

where %C = percent completeness
V = number of samples (or results) determined to be valid
T = total number of planned samples (or results)

Site	Sample Completeness Summary	Laboratory Completeness Summary
UXO_01	Soil saturation prevented the collection of sample X01SS0090024. The sample completeness was 98%.	The laboratory analytical completeness was 100%.
UXO_02	The sample collection completeness is 100%.	Five out of 2,142 explosive results were rejected because of a low matrix spike recovery. The laboratory completeness is 99.8%.
UXO_04	The sample collection completeness is 100%.	The laboratory analytical completeness was 100%.
UXO_05	The sample collection completeness is 100%.	The laboratory analytical completeness was 100%.
UXO_10	Soil saturation prevented the collection of sample X10SB0100406. The sample completeness was 98%.	Twelve out of 1,054 explosive results were rejected because of a low matrix spike recovery. The laboratory completeness is 98.9%.
UXO_12	The sample collection completeness is 100%.	The laboratory analytical completeness was 100%.
UXO_21	The sample collection completeness is 100%.	The laboratory analytical completeness was 100%.
UXO_23	The sample collection completeness is 100%.	The laboratory analytical completeness was 100%.
UXO_28	The sample collection completeness is 100%.	Nineteen out of 714 explosive results were rejected because of a low LCS or matrix spike recovery. The laboratory completeness is 97.3%.

3B.5.6 Sensitivity

The project quantitation limit goals (PQLGs) are listed in Worksheet #15 in the QAPP (April 2009).

Site	Sensitivity Summary
UXO_01	Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. The amount of sample volume collected affects the ability of the laboratory to achieve the desired PQLGs. There are instances where the non-detected sample results exceed the PQLGs because the laboratory did not use enough sample volume. All project action limits (PALs) were met. Because all the PALs were met no impact on data quality is expected due to exceedances of the PQLGs.
UXO_02	Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. However, at the inception of the project, the laboratory could not meet the PQLG for several compounds in soil, sediment, and aqueous samples. Worksheet #15 highlights the exceedances of the PQLGs. There are instances where the non-detected sample results exceed the PQLGs because the laboratory did not use enough sample volume or because of sample dilution. For instances where the laboratory quantitation limit exceeds the risk screening criteria for COPC selection, one half of the laboratory QL will be used.
UXO_04	Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. However, at the inception of the project, the laboratory could not meet the PQLG for nitroglycerin, benzene, chloroform, and methylene chloride, and arsenic in aqueous samples. Worksheet #15 highlights the exceedances of the PQLGs. The laboratory quantitation limit (LQL) exceeds the project action limit (PAL) for nitroglycerin, benzene, chloroform, and methylene chloride, and arsenic in aqueous samples. For comparison to risk screening criteria for COPC selection, one half the laboratory QL will be used.
UXO_05	Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. However, at the inception of the project, the laboratory could not meet the PQLG for arsenic, selenium, and tin in soil samples. Worksheet #15 highlights the exceedances of the PQLGs. The laboratory reported nondetected results down to the laboratory method detection limit (MDL) for arsenic and selenium, which did meet the PQLGs. The laboratory MDL for tin also met the PQLG for nondetected results; however, forty-nine out of 100 sample results were diluted because of possible matrix interference, which increased the nondetected reporting limits for tin in the affected samples. The nondetected explosive results for compounds 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, and RDX exceeded the PALs for sample X05SS0150006 because of a dilution for a possible matrix interference. The laboratory quantitation limit (LQL) exceeds the project action limit (PAL) for tin, 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, and RDX in several samples. For comparison to risk screening criteria for COPC selection, one half the laboratory QL will be used.

Site	Sensitivity Summary
UXO_10	Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. However, at the inception of the project, the laboratory could not meet the PQLGs for 2,4-dinitrotoluene, 2,4,6-trinitrotoluene, and RDX in sediment samples. Worksheet #15 highlights the exceedances of the PQLGs. The amount of sample volume collected affects the ability of the laboratory to achieve the desired PQLGs. There are instances where the non-detected sample results exceed the PQLGs because the laboratory did not use enough sample volume. The project action limits (PALs) for 2,4-dinitrotoluene, 2,4,6-trinitrotoluene, and RDX were not met. The laboratory quantitation limit (LQL) exceeds the ecological screening criteria, but is below the human health screening criteria for COPC selection. For comparison to ecological screening criteria for COPC selection, one half the laboratory QL will be used.
UXO_12	Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. However, at the inception of the project, the laboratory could not meet the PQLG for nitroglycerin in aqueous samples. Worksheet #15 highlights the exceedances of the PQLGs. The amount of sample volume collected affects the ability of the laboratory to achieve the desired PQLGs. There are instances where the non-detected sample results exceed the PQLGs because the laboratory did not use enough sample volume. The laboratory quantitation limit (LQL) exceeds the project action limit (PAL) for nitroglycerin. For comparison to risk screening criteria for COPC selection, one half the laboratory QL will be used.
UXO_21	Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. The amount of sample volume collected affects the ability of the laboratory to achieve the desired PQLGs. There are instances where the non-detected sample results exceed the PQLGs because the laboratory did not use enough sample volume. All project action limits (PALs) were met. Because all the PALs were met no impact on data quality is expected due to exceedances of the PQLGs.
UXO_23	Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. However, at the inception of the project, the laboratory could not meet the PQLG for arsenic, selenium, and tin in soil samples. Worksheet #15 highlights the exceedances of the PQLGs. The laboratory reported nondetected results down to the laboratory method detection limit (MDL) for arsenic and selenium, which did meet the PQLGs. The laboratory MDL for tin also met the PQLG for nondetected results, however three sample results were diluted because of possible matrix interference which increased the nondetected reporting limits for tin in samples X23SB0010204, X23SB0050204, and X23SB0090204. There are instances where the non-detected sample results exceed the PQLGs because the laboratory did not use enough sample volume. All project action limits (PALs) were met. Because all the PALs were met no impact on data quality is expected due to exceedances of the PQLGs.

Site	Sensitivity Summary
UXO_28	Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. However, at the inception of the project, the laboratory could not meet the PQLG for arsenic, selenium, and tin in soil samples. Worksheet #15 highlights the exceedances of the PQLGs. The laboratory reported nondetected results down to the laboratory method detection limit (MDL) for arsenic and selenium, which did meet the PQLGs. The laboratory MDL for tin also met the PQLG for nondetected results; however, four X28SS0010006, X28SS0080024, X28SS0180024, and X28SS0200024 sample results were diluted because of possible matrix interference, which increased the nondetected reporting limits for tin in samples X28SS0010006, X28SS0080024, X28SS0180024, and X28SS0200024. The nondetected explosive results for compounds 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, and RDX exceeded the PALs for sample X28SS0010006 because of a dilution for a possible matrix interference. There are instances where the non-detected sample results exceed the PQLGs because the laboratory did not use enough sample volume. The exceedances of the project PALs for five of 42 samples will not affect the overall analytical sensitivity.

3B.5.7 Accuracy

Accuracy in the laboratory is measured through the comparison of a laboratory control sample (LCS) result to a known or calculated value and is expressed as a percent recovery (%R). Surrogates and internal standards assess accuracy in organic methods. LCSs assess the accuracy of laboratory operations with minimal sample matrix effects. Surrogate compound analyses measure the combined accuracy effects of the sample matrix, sample preparation, and sample measurement. Internal standards, added after preparation, are for sample quantitation. Laboratory accuracy is determined by comparing calculated percent recoveries to accuracy control limits specified by the laboratory using the appropriate analytical method.

Percent recovery calculated using the following equation:

$$\%R = \frac{Ss - So}{S} \times 100$$

where %R = percent recovery
Ss = result of spiked sample
So = result of non-spiked sample
S = concentration of spiked amount.

Site	Accuracy Summary
UXO_01	Appendix I Table 1 shows that several results were qualified because of LCS and calibration noncompliances. The noncompliances in general do not show any directional bias with the data except for HMX. HMX had laboratory control sample (LCS) recoveries less than the laboratory quality control limit but greater than 30% indicating a slight low bias. Overall, the laboratory accuracy was acceptable and no data were rejected. There were no quality control deficiencies noted for field accuracy.
UXO_02	Appendix I Table 2 shows that one 2,4,6-trinitrotoluene and four tetryl results were rejected because of a matrix spike recovery less than 10%. There is a low bias for the tetryl and 2,4,6-trinitrotoluene results in the individual associated samples. The noncompliances listed in Table 2 show multiple qualifications for hold time, calibration, matrix spike recovery, LCS recovery, ICP serial dilution, ICP interference, and internal standard noncompliances. Data qualified with “K” and “L” qualifiers indicate a high or low directional bias, respectively. There was no quality control deficiencies noted for field accuracy.
UXO_04	Appendix I Table 3 show multiple qualifications for calibration, matrix spike recovery, LCS recovery, hold time, ICP serial dilution, ICP interference, internal standard, surrogate recovery, and percent difference between column noncompliances. Data qualified with “K” and “L” qualifiers indicate a high or low directional bias, respectively. There was no quality control deficiencies noted for field accuracy.
UXO_05	Appendix I Table 4 show multiple qualifications for calibration, matrix spike recovery, LCS recovery, hold time, ICP serial dilution, ICP interference, and percent difference between column noncompliances. Data qualified with “K” and “L” qualifiers indicate a high or low directional bias, respectively. There was no quality control deficiencies noted for field accuracy.
UXO_10	Appendix I Table 5 shows that twelve tetryl several results were rejected because of a LCS percent recovery less than 10%. There is a low tetryl bias for the tetryl results and the laboratory not be able to detect tetryl at the stated detection limit. The noncompliances listed in Table 2 do not show any directional bias with the data except for HMX, RDX, and tetryl. HMX had laboratory control sample (LCS) recoveries less than the laboratory quality control limit but greater than 30% indicating a slight low bias. RDX and tetryl had matrix spike recoveries less than the laboratory quality control limit but greater than 30% for one sample (X10SD0010024). This indicates a slight low bias for RDX and tetryl in sample X10SD0010024 only, all other matrix spikes had acceptable percent recoveries. Overall, the laboratory accuracy was acceptable, with the exceptions noted. There were no quality control deficiencies noted for field accuracy.
UXO_12	Appendix I Table 6 shows that several results were qualified because of LCS, matrix spike, serial dilution, percent difference between columns, and calibration noncompliances. The noncompliances in general do not show any directional bias with the data except for HMX, 1,3,5-trinitrobenzene, 2,4,6-trinitrotoluene, and tetryl. HMX had laboratory control sample (LCS) recoveries less than the laboratory quality control limit but greater than 30% indicating a slight low bias. The compounds 1,3,5-trinitrobenzene, 2,4,6-trinitrotoluene, and tetryl had matrix spike recoveries less than the laboratory quality control limit but greater than 30% for sample (X12SW001). This indicates a slight low bias for 1,3,5-trinitrobenzene, 2,4,6-trinitrotoluene, and tetryl in sample X12SW001. HMX had a matrix spike recovery less than the laboratory quality control limit but greater than 30% for one sample (X12SD001). This indicates a slight low bias for RDX and tetryl in sample X12SD001. All other matrix spike recoveries were acceptable. Overall, the laboratory accuracy was acceptable and no data were rejected. There were no quality control deficiencies noted for field accuracy.

Site	Accuracy Summary
UXO_21	Appendix I Table 7 shows that several results were qualified because of LCS noncompliances. HMX had laboratory control sample (LCS) recoveries less than the laboratory quality control limit but greater than 30% indicating a slight low bias. Overall, the laboratory accuracy was acceptable and no data were rejected. There were no quality control deficiencies noted for field accuracy.
UXO_23	Appendix I Table 8 shows that several results were qualified because of LCS, matrix spike, and hold time noncompliances. The noncompliances in general do not show any directional bias with the data except for the following parameters: HMX had laboratory control sample (LCS) recoveries less than the laboratory quality control limit but greater than 30% indicating a slight low bias. All explosive compounds for all samples, except sample X23SB0090204, were extracted one day outside the 14 day extraction hold time. All explosive results are considered to have a low bias, except for sample X23SB0090204. All mercury samples were analyzed one day outside the 28 day hold time. The two nondetected mercury results are considered to have a low bias. All other mercury results were qualified as estimated without directional bias due to an ICP interference. All nondetected antimony and selenium results had matrix spike recoveries less than the quality control limit but greater than 30% indicating a slight low bias. Magnesium, potassium, and vanadium had matrix spike recoveries greater than the laboratory control limit. All positive results for these metals are considered to be biased high. Several copper, selenium, and strontium results were qualified as biased high due to an ICP interference. Overall, the laboratory accuracy was acceptable and no data were rejected. There were no quality control deficiencies noted for field accuracy.
UXO_28	Appendix I Table 9 shows that 19 tetryl results were rejected because of a LCS or matrix spike recovery less than 10%. There is a low bias for the tetryl results in the individual associated samples. The noncompliances listed in Table 2 show multiple qualifications for matrix spike recovery, LCS recovery, ICP interference, and percent difference between column noncompliances. Data qualified with “K” and “L” qualifiers indicate a high or low directional bias, respectively. There was no quality control deficiencies noted for field accuracy.

3B.5.8 Precision

Precision is a measure of the degree to which two or more measurements are in agreement and describes the reproducibility of measurements of the same parameter for samples analyzed under similar conditions. Precision for chemical parameters is expressed as a Relative Percent Difference (RPD), which is defined as the ratio of the difference to the mean for the two values being evaluated. RPDs, typically expressed as percentages, are used to evaluate both field and laboratory duplicate precision and are calculated as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where RPD = relative percent difference

V1, V2 = two results obtained by analyzing duplicate samples.

The precision estimates obtained from duplicate field samples encompass the combined uncertainty associated with sample collection, homogenization, splitting, handling, laboratory and field storage (as applicable), preparation for analysis, and analysis. In contrast, precision estimates obtained from analyzing duplicate laboratory samples incorporate only homogenization, subsampling, preparation for analysis, laboratory storage (if applicable), and analysis uncertainties.

Site	Accuracy Summary
UXO_01	No data were qualified due to laboratory or field duplicate precision noncompliances.
UXO_02	Several results for aluminum, antimony, arsenic, and aluminum were qualified because of a laboratory duplicate precision noncompliance. Several results for aluminum, barium, calcium, copper, iron, magnesium, and manganese were qualified because of a field duplicate precision noncompliance. Overall, the field and laboratory precision was acceptable and no data were rejected.
UXO_04	Twenty antimony results were qualified because of a laboratory duplicate precision noncompliance. Several samples for aluminum, barium, chromium, cobalt, iron, lead, magnesium, manganese, potassium, sodium, and strontium were qualified because of field duplicate precision noncompliance. Benzene and toluene were qualified because of field duplicate precision in one aqueous duplicate pair. Overall, the field and laboratory precision was acceptable and no data were rejected.
UXO_05	Several results for aluminum, calcium, arsenic, potassium, and manganese were qualified because of a field duplicate precision noncompliance. Overall, the field and laboratory precision was acceptable and no data were rejected.
UXO_10	No data were qualified due to laboratory or field duplicate precision noncompliances.
UXO_12	No data were qualified due to laboratory or field duplicate precision noncompliances.
UXO_21	One total organic carbon (TOC) result was qualified because of a laboratory duplicate precision noncompliance. The other two TOC laboratory duplicates had acceptable precision. The one laboratory duplicate noncompliance was most likely due to a lack of sample homogeneity and isolated to a particular sample. This one lab duplicate noncompliance should not affect data quality. Overall, the laboratory precision was acceptable and no data were rejected. There were no quality control deficiencies noted for field precision.
UXO_23	All arsenic and aluminum results were qualified because of a field duplicate precision noncompliance. Overall, the field precision was acceptable and no data were rejected. There was no quality control deficiencies noted for laboratory precision.
UXO_28	All results for copper were qualified because of a field duplicate precision noncompliance. The field duplicate pair for sample X28SS0050006 had results for calcium, copper, iron, lead, lithium, magnesium, nickel, potassium, and vanadium were qualified because of a field duplicate precision noncompliance. The field duplicate imprecision for sample X28SS0050006 indicates a lack of matrix homogeneity for this sample, Overall, the field and laboratory precision was acceptable and no data were rejected.

3B.5.9 Comparability

Comparability is defined as the confidence with which one data set can be compared with another (e.g., among sampling points and among sampling events). Using standardized sampling and analysis methods, as well as standardized data reporting formats assists in achieving comparability. Reporting of results in consistent units ensured comparability with previous data. Evaluation of QC samples and adherence to the QAPP assists in the assessment of comparability.

No comparability issues were noted during the data validation process.

3B.5.10 Representativeness

Representativeness is an expression of the degree to which data accurately and precisely depict the actual characteristics of a population or environmental condition existing at the site. The QAPP (September 2009) and the use of standardized sampling, sample handling, sample analysis, and data reporting procedures were designed so that the final data would accurately represent actual site conditions.

It is believed that all reported data are adequately representative of site conditions.

3B.6 DATA COMPARISON TO PROJECT ACTION LIMITS

This investigation required the collection of field measurements and FBL chemical data that could be used to determine whether further investigation is necessary. To conduct comparisons of site data to screening values, the laboratory quantitation limits (QLs) must be low enough to measure MC concentrations to regulatory or other stringent and conservative values.

Chemical Data and Physical Characteristics: Chemical data were used to determine the presence of explosives, volatiles, and metals in the surface and subsurface soil, sediment, surface water, and groundwater. Chemical analysis was performed for explosives using SW 846 Method 8330B, volatiles using SW-846 Method 8260B, and metals using SW-846 Method 6010B/6020A.

Three of the soil samples from different soil sampling intervals at each of the sites were shipped to the laboratory and analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

The list of all chemical analytes is presented in Worksheet #15 and the laboratory methods are listed in Worksheet #18 of the UFP SAP.

Project Action Limits

This investigation required chemical data that can be used to further characterize the sites and to begin a screening level ecological and human health risk assessment. Chemical concentrations were first compared to conservative screening values. If any chemical concentration exceeded a screening value, human health or ecological risks may be, but are not necessarily, unacceptable. If necessary, a human health and ecological risk assessment will be conducted during an RI. To conduct comparisons of site data to screening values, the selected laboratory must be able to achieve quantitation limits that are low enough to measure constituent concentrations below the screening values. For this investigation the screening values, which are also known as the project action limits (PALs), are listed and described below:

- U.S. EPA Regional Soil Screening Levels for Chemical Contaminants at Superfund Sites-Residential Use (July 7, 2008).
- Maryland Department of the Environment Generic Cleanup Standards (soil, August 2001).
- U.S. EPA Ecological Soil Screening Levels (ESSLs) (2005).
- U.S. EPA Region III Biology Technical Assistance Group (BTAG) criteria if U.S. EPA ESSLs are not available.
- Oak Ridge National Laboratory (ORNL) ecological screening levels if neither U.S. EPA ESSLs nor Region III BTAG criteria are available (1997).
- Background Concentrations established for soils (Appendix H).

Background values for soil have been developed. In the event that a chemical analyte exceeded a PAL, but fell below or was equal to an established background concentration, the chemical was not retained as a COPC. On the other hand, if the chemical analyte was measured above the established background concentration, the chemical was retained as a COPC. Established background concentrations are provided in Appendix H.

The list of all chemical analyses performed for each site is presented in Table 3B-2.

In addition, three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis from each site. The sample collection methods and analyses are outlined in the individual site sections of the report.

3B.7 CONCEPTUAL SITE MODEL

A CSM is a description of a site and its environment that is based on existing knowledge. It describes the sources of MEC and MC at a site; actual, potentially complete, and incomplete exposure pathways; current and proposed reasonable future uses of the property; and potential receptors. The source-receptor interaction is a descriptive output of a CSM.

A key element of the CSM is the exposure pathway analysis. For MEC, a complete or potentially complete exposure pathway must include the following components: (1) a source (e.g., location where MEC are expected to be found); (2) access (e.g., controlled or uncontrolled access, items on the surface or within the subsurface); (3) an activity (e.g., non-intrusive grounds maintenance or intrusive construction); and (4) receptors [e.g., Navy personnel (military and civil servants), construction workers, recreational users, authorized visitors, ecological receptors]. It is important to recognize that environmental mechanisms (e.g., erosion) and/or human intervention may result in the repositioning of MEC.

For MC, a complete or potentially complete exposure pathway must include the following components: (1) a source (e.g., location where MC are expected to be found); (2) an exposure medium (e.g., surface soil); (3) an exposure route (e.g., dermal contact); and (4) receptors [e.g., Navy personnel (military and civil servants), construction workers, recreational users, authorized visitors, ecological receptors]. If the point of exposure is not at the same location as the source, the pathway may also include a release mechanism (e.g., volatilization) and a transport medium (e.g., air).

The potential interactions between the source and receptors are assessed differently for MEC and MC. For MEC, interaction between the potential receptors and MEC source has two components. The receptor must have access to the source and must engage in some activity that results in contact with individual MEC items within the source area. For MC, interaction between the source and receptors involves an MC release mechanism, an exposure medium containing the MC, and an exposure route that places the receptor into contact with the contaminated medium. An exposure pathway is incomplete if any one component is lacking and unlikely to be present in the future. All potential exposure pathways

are typically initially considered and then information on current and reasonably anticipated future conditions is used to assess whether an exposure pathway is complete, potentially complete, or incomplete.

Initial CSMs were developed as part of the PA Report (Malcolm Pirnie, 2005). These CSMs, which were presented in the PA Report, were reviewed and modified as necessary based on additional information obtained during the Tetra Tech site visits and scoping meetings conducted during the preparation of the UFP SAP. Updated versions of the CSMs, which incorporate data obtained in the SI field effort, are presented in the individual site sections.

3B.8 STATISTICAL CALCULATIONS

A 95 percent Upper Confidence Limit (UCL) is the upper bound of the associated confidence interval on the mean. Exposure assessment and cleanup decisions in support of U.S. EPA projects are often made based upon the mean concentrations of the contaminants of potential concern. A 95 percent *UCL* of the unknown population arithmetic mean is often used to estimate the exposure point concentration (EPC) term (EPA 1992; EPA 2002). It is, therefore, important to compute a reliable, conservative, and stable 95 percent *UCL* of the population mean using the available data. There are several methods for calculating 95 percent UCLs depending on the data distribution that can be used to model the sample data and the amount of censoring that is present (percent of non-detected concentrations). For chemicals with maximum concentrations greater than the PAL or 95 percent background Upper Tolerance Limit (UTL), PRO UCL version 4.00.04 was used to calculate the appropriate UCL. Then, the UCL was compared to the PAL. If the UCL was less than the PAL, it was determined that the chemical would not pose a risk, if the UCL was greater than the PAL, then it was determined that further evaluations should be conducted.

3B.9 HUMAN HEALTH RISK RATIO SCREENING

The first stage of conducting the human health risk evaluation involved comparing the detected concentration of a chemical detected in soil, sediment, surface water, or groundwater or at each sampling location to the applicable criteria identified in this section. In general, if the detected concentration was greater than a risk screening level, the chemical was identified as a COPC.

The following screening levels were used to select COPCs for soil and sediment:

- USEPA Regional Screening Levels (RSLs) for residential land use (May 2010).

- MDE Cleanup Standards for Soil (June 2008).

The following screening levels were used to select COPCs for groundwater:

- USEPA RSLs for tap water under residential land use (May 2010).
- Federal primary and secondary Maximum Contaminant Levels (MCLs) (USEPA, October 2009).
- Maryland drinking water standards (MDE, June 2008).

If the detected concentration for a chemical exceeded the screening levels identified above at a sampling location, then that chemical was considered to be a COPC at that location. Subsequently, a more detailed human health risk evaluation was conducted with these COPCs. Because of the additive noncarcinogenic effects of some chemicals (i.e., some noncarcinogenic chemicals impact the same target organs or exhibit similar mechanisms of action), one tenth of the RSL for noncarcinogenic effects was used as the risk screening level to select COPCs. The more detailed human health risk evaluation consisted of estimating carcinogenic and noncarcinogenic risks for the COPCs at each sampling location.

Carcinogenic risks are expressed in the form of dimensionless probabilities, referred to as incremental lifetime cancer risks (ILCRs). The ILCR was derived by dividing the carcinogenic risk-based concentration (RBC) for a particular medium (e.g., soil) into the detected concentration at each sampling location. The USEPA RSLs were used as the RBCs in this evaluation. COPCs potentially resulting in carcinogenic effects were evaluated using the following equation:

$$ILCR = \sum_{i=1}^{n} \left(\frac{C_i}{RBC_i} \times 10^{-6} \right)$$

where: ILCR = Incremental lifetime cancer risk.
C_i = Detected concentration (µg/L) for compound i.
RSL = Risk-based concentration (µg/L) for compound i.
10^{-6} = Risk assessment point of departure risk level.

Multiplying the C_i/RBC ratio by USEPA's point of departure risk level, 1×10^{-6}, produces a cancer risk estimate for the detected COPC. The ratios are multiplied by 1×10^{-6} because the RBCs correspond to a 1×10^{-6} risk level. The ILCR values for all COPCs at each sampling location were summed to account for potential cumulative carcinogenic effects of multiple carcinogens detected in an environmental medium. The total ILCR at each sampling location was then compared to USEPA's target cancer risk range of

1×10^{-4} to 1×10^{-6}, which is used to determine whether a potential for human health risk exists at a site. According to the USEPA, for known or suspected carcinogens, "acceptable" exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk between 1×10^{-4} to 1×10^{-6}, or less than 1×10^{-6}. A 1×10^{-4} ILCR estimate corresponds to the potential for the occurrence of one additional incidence of cancer in an exposed population of 10,000 individuals. Generally, an estimated ILCR greater than 1×10^{-4} is regarded as "unacceptable."

Non-carcinogenic risk estimates are presented in the form of hazard quotients (HQs). The HQ was derived by dividing the non-carcinogenic RBC for a particular medium (e.g., soil) into the detected concentration at each sampling location. Compounds potentially resulting in non-carcinogenic (systemic) effects were evaluated using the following equations:

$$HQ_i = \frac{C_i}{RBC}$$

$$HI = \sum_{i=1}^{n} HQ_i$$

where:
- HQ_i = Hazard quotient for compound i.
- C_i = Detected concentration (µg/L) for compound i.
- RBC = Risk-based concentration (µg/L) for compound i.
- HI = Hazard index.

The HQs for all COPCs at each sampling location were summed to account for potential non-carcinogenic effects associated with multiple chemical exposures. The total HI for each sampling location was then compared to the USEPA's target level of 1.0. "Acceptable" exposure levels are generally concentration levels that represent an HI less than or equal to 1.0. However, because all chemicals do not exhibit the same mechanism of action or impact the same target organ, the exceedance of this value does not necessarily constitute an "unacceptable" non-carcinogenic risk. If the estimated HI was greater than 1.0, non-carcinogenic effects were segregated according to the affected target organs, and target organ HIs were calculated, which represent the sum of those chemicals that impact similar target organs or exhibit similar mechanisms of action. Generally, estimated HIs greater than 1.0 for the target organs are considered to be "unacceptable."

Some chemicals exhibit both carcinogenic and noncarcinogenic effects. The more restrictive USEPA RSL was used for screening, but both carcinogenic and noncarcinogenic risks were estimated.

3B.10 ECOLOGICAL RISK ASSESSMENT SCREENING METHODOLOGY

The goal of this Ecological Risk Assessment (ERA) screening was to determine whether adverse ecological impacts are present as a result of exposure to chemicals released to the environment through historical activities at any of the Ten Munitions Sites. This ERA screening contains information that enables risk managers to conclude that either ecological risks at the site are negligible or that further information is necessary to evaluate potential ecological risks at the site.

The ERA screening methodology is in accordance with guidance presented in the following documents:

- Final Guidelines for Ecological Risk Assessment (USEPA, 1998).
- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997).

This ERA screening consists of Steps 1, 2, and 3a of the eight step ERA process. The first two screening steps comprise the screening-level ecological risk assessment (SERA), where conservative exposure estimates are compared to screening-level and threshold toxicity values. Step 3a is the first step of a baseline ecological risk assessment (BERA), and consists of refining the conservative assumptions following Steps 1 and 2 to further focus the ERA process on the chemicals of greatest concern at a site. The remaining steps of the ERA process require revision to the Work Plan and Field Sampling Plan prior to initiation, and are not included in this ERA screening methodology. Appendix L includes the ecological risk screening supporting documentation.

3B.10.1 Problem Formulation

Problem formulation is the first phase of an ERA and discusses the goals, size, and focus of the assessment. It includes general descriptions of the sites with emphasis on the habitats and ecological receptors present. This phase also involves characterization of site-related chemicals, chemical sources, migration routes, and an evaluation of routes of chemical exposure. The assessment and measures of effects to be evaluated are also selected. Finally, a CSM is developed that describes how chemicals associated with the site in question may come into contact with ecological receptors.

The objectives of this step are to initially identify and characterize the habitats and ecological resources throughout the site, and to describe the likely chemical sources, release mechanisms, migration pathways, and the fate of chemicals resulting from site-related activities, as well as ecological receptors that could be

adversely affected by chemicals. The environmental setting and potential contaminant sources are discussed separately within the site-specific ERA screening sections.

3B.10.1.1 Potential Exposure Pathways

3B.10.1.1.1 Surface Soil

Surface soil for the purpose of this ERA screening are soil samples with a starting depth of 0 feet and ending depth of 0.5 foot. Several groups of terrestrial ecological receptors can be exposed to chemicals in the surface soil. Invertebrates, such as earthworms, are exposed to chemicals as they move through the soil, and ingest soil particles while searching for food. Plants are exposed to chemicals via direct contact as chemicals are absorbed through the roots and may then translocate to different parts of the plants (i.e., leaves, seeds).

Small mammals may be exposed to chemicals in the soil via several exposure routes. They may be exposed by direct contact as they search for food or burrow into the soil. Exposure of terrestrial wildlife to chemicals in the soil via dermal contact is unlikely to represent a major exposure pathway because fur, feathers, and chitinous exoskeletons are expected to minimize transfer of chemicals across dermal tissue. Small mammals are most likely exposed to chemicals in the soil via incidental ingestion of soil, and ingestion of plants and/or invertebrates that have accumulated chemicals from the soil.

Larger predatory species, such as the red fox and red-tailed hawk, can be exposed (indirectly) to site chemicals in the soil by ingesting small mammals that have accumulated chemicals from the soil and food items; however, .

3B.10.1.1.2 Sediment

Ecological receptors can be exposed to chemicals in the sediment. Aquatic receptors, including aquatic vertebrates (i.e., fish), benthic invertebrates, amphibians, and reptiles can be exposed to sediment contamination through direct contact and incidental ingestion of contaminated sediment. Piscivorous wildlife, can also be exposed to contamination in sediment primarily through the ingestion of aquatic prey items. Piscivorous wildlife may also be exposed to sediment contamination, although to a lesser degree, by direct contact and incidental sediment ingestion.

3B.10.1.1.3 Surface Water

Aquatic and terrestrial receptors can be exposed to chemicals in the surface water. Aquatic vertebrates, such as fish, benthic invertebrates, amphibians, and reptiles, can be exposed to contamination primarily through direct contact and ingestion of the surface water. Other species, including terrestrial vertebrates, can be exposed to contamination by ingestion of surface water and through consumption of food items such as fish that have been exposed to and have accumulated chemical contamination through direct contact.

3B.10.2 Endpoints

3B.10.2.1 Assessment Endpoints

Assessment endpoints are an explicit expression of the environmental value that is to be protected (USEPA, 1997). The selection of these endpoints is based on the habitats present, the migration pathways of chemicals, and the routes that chemicals may take to enter receptors.

For this ERA screening, the assessment endpoints include the protection of the following groups of receptors from a reduction in growth, survival, and/or reproduction caused by site-related chemicals:

- Soil invertebrates
- Benthic invertebrates
- Aquatic Organisms
- Terrestrial vegetation
- Insectivorous birds and mammals
- Herbivorous birds and mammals

The following paragraphs discuss why the above assessment endpoints were selected for this ERA screening.

Soil Invertebrates: Soil invertebrates present at the site aid in the formation of soil, as well as redistribution and decomposition of organic matter in the soil, and serve as a food source for higher trophic-level organisms. They can also accumulate some contaminants, which can then be transferred to the higher trophic-level organisms that consume invertebrates.

Benthic Invertebrates: Benthic invertebrates serve as a food source for higher trophic-level organisms (i.e., fish, amphibians, birds, mammals). They can also accumulate contaminants, which can be transferred to higher trophic-level organisms that consume invertebrates.

Fish: Fish are likely present in water bodies at NSF Indian Head and feed primarily on invertebrates, plants, and/or other fish. Fish are exposed to and can accumulate contaminants from the surface water, sediment, or the food items they consume.

Terrestrial Vegetation: Terrestrial vegetation at the site consists of grasses, shrubs, and trees. They serve as a food source, provide shade and cover for many organisms, and help prevent soil erosion, among other important functions. They can also accumulate some contaminants, which can then be transferred to the higher trophic-level organisms that consume plants.

Insectivorous Birds and Mammals: Insectivorous birds and mammals consume soil invertebrates and insects and in turn serve as a food source for higher trophic level carnivores. These birds and mammals are exposed to, and can accumulate, chemicals that are present in the food items they consume.

Herbivorous Birds and Mammals: Herbivorous birds and mammals (i.e., animals that consume only plant tissue) are present at the site because of the vegetative habitats (i.e., forested, open field). Their role in the community is essential because without them, higher trophic levels could not exist (Smith, 1966). They may be exposed to and accumulate contaminants that are present in the plants they consume.

As indicated in the USEPA Ecological Risk Assessment Guidance document for Superfund (USEPA, 1997), “it is not practical or possible to directly evaluate risks to all of the individual components of the ecosystem at a site. Instead, assessment endpoints focus the risk assessment on particular components of the ecosystem that could be adversely affected by contaminants from the site.” Therefore, this ERA screening focused on the endpoints that tend to yield the highest risks, which will account for endpoints that have lower risks.

Carnivorous birds and mammals generally have large home ranges. When the size of the site is compared to the home range of higher trophic carnivores, such as the red-tailed hawk (with an average of 1,692 acres) and the red fox (with an average of 1,793 acres), carnivores would only receive a very small portion of their diet from any of the NSF Indian Head Sites in this evaluation, and therefore, are not included as receptors in this ERA.

3B.10.2.2 Measures of Effects

Measures of effects are estimates of biological impacts (i.e., survival, growth and/or reproduction) that are used to evaluate the assessment endpoints. The following measures of effects were used to evaluate the assessment endpoints in this ERA screening.

- Decreases in survival, growth, and/or reproduction of plants, soil and benthic invertebrates, and fish were evaluated by comparing the measured concentrations of chemicals in the surface soil, sediment, and surface water to screening values designed to be protective of ecological receptors.

- Decreases in survival, reproduction, and/or increases in developmental effects of birds and mammals were evaluated by comparing the estimated ingested dose of contaminants in the surface soil to no-observed-adverse-effects levels (NOAELs) and lowest-observed-adverse-effects levels (LOAELs) for surrogate wildlife species.

3B.10.3 Ecological Effects Evaluation

The preliminary ecological effects assessment is an investigation of the relationship between the exposure to a chemical and the potential for adverse effects resulting from exposure. In this step, screening levels for toxicity of the chemicals to ecological receptors were compiled.

3B.10.3.1 Terrestrial plants and invertebrates

Potential risks to terrestrial plants and invertebrates resulting from exposure to chemicals in the surface soil were evaluated by comparing chemical concentrations to ecological screening levels. The screening levels consisted of the USEPA Ecological Soil Screening Levels (Eco SSLs) (USEPA, 2003c, 2005a-j, 2006c, 2007a-g) Canadian Soil Quality Guidelines (SQGs) (CCME, 2006 and supporting documents from CCME, 2004a-d and EC, 1999a-h and 2001), NOAA SQuiRT Tables (Buchman, 2008), and USEPA Region 3 Biological Technical Assistance Group (BTAG) Screening Levels (USEPA, 1995). These toxicity values are expressed in units of concentration because terrestrial plants and invertebrates are in direct contact with the soil. The soil screening levels are presented in Table L-1 in Appendix L.

3B.10.3.2 Benthic invertebrates

Potential risks to benthic invertebrates resulting from exposure to chemicals in the sediment were evaluated by comparing chemical concentrations to the USEPA Region 3 BTAG Freshwater Sediment Screening Levels (USEPA, 2006a) and NOAA SQuiRT Tables (Buchman, 2008). These toxicity values

are expressed in units of concentration because the benthic invertebrates are in direct contact with the sediment. The sediment screening levels are presented in the COPC selection table.

3B.10.3.3 Aquatic Organisms

Risks to aquatic receptors, including fish and benthic invertebrates, resulting from direct exposure to chemicals in surface water and indirect exposure to groundwater via the surface water pathway were evaluated by comparing the chemical concentrations in surface water to USEPA Region 3 BTAG Freshwater Screening Levels (USEPA, 2006b). The screening levels are provided in the COPC selection section for each applicable Site.

3B.10.3.3 Mammals and birds

Risks to wildlife from exposure to chemicals in surface soil and sediment were determined by estimating the Chronic Daily Intake (CDI) using food chain models and comparing the CDI to toxicity reference values (TRVs) representing acceptable daily doses in mg/kg-day. The TRVs were developed from NOAELs and LOAELs obtained from wildlife studies. The majority of the TRVs were obtained from the ORNL (Sample et al., 1996) and the USEPA Eco SSL documents, and were supplemented with other toxicity information when necessary. Only chemicals considered by USEPA to be important bioaccumulative chemicals (USEPA, 2006) or chemicals that exceeded wildlife criteria were included in the food chain model.

Appendix L presents the TRVs and the sources of the NOAELs and LOAELs used in this ERA. If a subchronic study was used to develop the TRV, the final value was multiplied by a factor of 0.1 to account for uncertainty between subchronic and chronic effects. Also, the LOAEL was multiplied by a factor of 0.1 to estimate a NOAEL TRV if only a LOAEL study was available. The chemical-specific Eco SSL documents provide both NOAELs and LOAELS for various studies, but overall TRVs are calculated only for NOAELs. The geometric mean of the chemical-specific growth and reproduction LOAELs from the chemical-specific Eco SSL documents were used as the LOAEL TRVs.

3B.10.4 Characterization of Exposure

This portion of the ERA screening includes identification of contaminant concentration data used as the EPCs to represent ecological exposure in various media. Terrestrial plants and invertebrates are exposed to chemicals in the surface soil, and aquatic organisms (i.e., fish and benthic invertebrates) are exposed to chemicals in the sediment and surface water through ingestion and/or direct contact.

Maximum chemical concentrations were used as the EPCs for the initial screening step. Composite samples were collected from surface soil throughout the sites.

As discussed above, the total exposure dose of terrestrial wildlife to chemicals in soil, sediment, and associated food items such as plants, invertebrates, and fish was estimated using food chain models. Selection of a particular species is required so that intake through ingestion can be estimated. The availability of exposure parameters (i.e., body mass, and ingestion rates) are factors in selecting surrogate species. The following surrogate species were used for the food chain modeling:

- Herbivorous mammal: meadow vole.
- Herbivorous bird: bobwhite quail.
- Insectivorous mammal: short-tailed shrew.
- Insectivorous bird: American robin.

Receptor profiles for the surrogate species, including the exposure parameters used in the food-chain modeling are included in Appendix L.

The following equation was used to calculate the CDI for wildlife receptors:

$$CDI = \frac{[(Cf * If) + (Cs * Is) + (Cw * Iw)] * H}{BW}$$

where:

CDI	=	Chronic daily intake [milligrams per kilogram (mg/kg)-day]
Cf	=	Chemical concentration in food – (see discussion below)
Cs	=	Chemical concentration in surface soil or sediment (mg/kg)
If	=	Food ingestion rate [kilograms per day (kg/day)]
Is	=	Incidental surface soil or sediment ingestion rate (kg/day)
H	=	Portion of food intake from the contaminated area (unitless)
BW	=	Body weight (kg)

Chemical concentrations in food items for soil invertivorous and herbivorous receptors were calculated using soil-to-invertebrate or soil-to-plant bioaccumulation factors (BAFs) and regression equations from the USEPA Eco SSL Guidance Document (USEPA, 2007d) or other published sources. The sources of the BAFs are documented in Appendix L. The following equation was used to calculate the chemical concentration in plants or invertebrates when BAFs are used:

$$Cf = Cs * BAF$$

where:

Cf	=	Contaminant concentration in food (mg/kg)
Cs	=	Contaminant concentration in surface soil (mg/kg)
BAF	=	Biota-soil bioaccumulation factor (unitless)

Table L-2 in Appendix L summarizes the exposure factors that were used for the food chain model. The food ingestion rates were on a dry weight basis. The following input parameters were used in the dose equations under the conservative screening scenario:

- Maximum surface soil concentrations
- Maximum BAFs
- Conservative receptor body weights and ingestion rate

For refining the conservative exposure assumptions in Step 3a, the following input parameters were used:

- Average surface soil concentrations.
- Average BAFs (for some chemicals, these are the same as the conservative BAFs).
- Average receptor body weights and ingestion rates.

3B.10.5 Risk Characterization

The risk characterization is the final phase of an ERA that compares exposure to ecological effects. It is at this phase that the likelihood of adverse effects occurring as a result of exposure to a stressor is evaluated. An ecological effects quotient (EEQ) approach was used to characterize the potential risk to ecological receptors by comparing exposure concentrations and doses to effects data. When EEQ values exceed 1.0, it is an indication that ecological receptors are potentially at risk; additional evaluation or data may be necessary to confirm with greater certainty whether ecological receptors are actually at risk, especially since most benchmarks are developed using conservative exposure assumptions and/or studies. The EEQ value should not be construed as being probabilistic; rather, it is a numerical indicator of the extent to which an EPC exceeds or is less than a benchmark.

The EEQs for surface soil receptors were calculated as follows:

$$EEQ = \frac{Css}{SSSL}$$

where:

EEQ	=	Ecological Effects Quotient (unitless)
Css	=	Chemical concentration in surface soil [micrograms per kilogram (µg/kg) or mg/kg]
SSSL	=	Surface soil screening level (µg/kg or mg/kg)

The EEQs for sediment invertebrates were calculated as follows:

$$EEQ = \frac{Csd}{SdSL}$$

where:

EEQ	=	Ecological Effects Quotient (unitless)
Csd	=	Chemical concentration in sediment (µg/kg or mg/kg)
SdSL	=	Sediment screening level (µg/kg or mg/kg)

The EEQs for aquatic biota were calculated as follows:

$$EEQ = \frac{Csw \text{ or } Cgw}{SwSL}$$

where:

EEQ	=	Ecological Effects Quotient (unitless)
Csw	=	Chemical concentration in surface water (µg/L)
SwSL	=	Surface water screening level (µg/L)

The EEQs for wildlife were calculated as follows:

$$EEQ = \frac{CDI}{TRV}$$

where:

EEQ	=	Ecological effects quotient (unitless)
CDI	=	Chronic daily intake dose (mg/kg-day)
TRV	=	Toxicity reference value (NOAEL or LOAEL) (mg/kg-day)

3B.10.6 Selection of Chemicals of Potential Concern

The final part of the screening evaluation is selection of COPCs. Chemicals that are not selected as COPCs are assumed to present negligible risk to ecological receptors and were not considered for further evaluation in the ERA. Chemicals that are retained as COPCs were evaluated further in Step 3a. Ecological COPCs were selected using the following procedures:

- Chemicals with maximum concentrations less than the 95% UTL from the Indian Head Background dataset were not retained as COPCs.

- Chemicals with EEQs greater than 1.0 (using screening values) were retained as COPCs for further evaluation because they have a potential to cause risk to ecological receptors.

- Chemicals with EEQs greater than 1.0 based on the conservative food chain model using NOAELs were retained as COPCs, because they have the potential to cause risk to mammals and birds.

- Chemicals without screening values were retained as COPCs, but were only evaluated qualitatively.

- Calcium, magnesium, potassium, and sodium were not retained as COPCs, because they are essential nutrients that can be tolerated by living systems even at high concentrations. No evidence indicates that these chemicals are related to site operations, and they are not considered hazardous chemicals.

The selection of COPCs for each site is presented in the site-specific ERA screening section.

3B.10.7 Step 3A Refinement

Step 3a consists of a refinement of the conservative exposure assumptions and concentrations to evaluate the potential risks to ecological receptors (i.e., plants, invertebrates, aquatic biota, and wildlife receptors). The objective of the Step 3a evaluation is to further refine the number of chemicals that are retained as COPCs in order to focus additional efforts on chemicals that are of major ecological concern.

The following describes the process for further evaluating chemicals initially selected as COPCs in soil and sediment.

For chemicals that are evaluated further in Step 3a, the following factors were evaluated, as appropriate, to determine if the risks are great enough to warrant additional evaluations. Note that all of these factors may not be discussed for each chemical and/or receptor group.

- Magnitude of criterion exceedance: Although the magnitude of the risks may not relate directly to the magnitude of a criterion exceedance, the magnitude of the criterion exceedance may be one item used in a lines-of-evidence approach to determine the need for further site evaluation. The greater the criterion exceedance, the greater the probability and concern that an unacceptable risk exists.

- Frequency of chemical detection and spatial distribution: A chemical detected at a low frequency typically is of less concern than a chemical detected at higher frequency if toxicity and concentrations and spatial areas represented by the data are similar. All else being equal, chemicals detected frequently were given greater consideration than those detected relatively infrequently. In addition, the spatial distribution of a chemical may be evaluated to determine the area that a sample represents.

- Contaminant bioavailability: Many contaminants (especially inorganics) are present in the environment in forms that are typically not bioavailable, and the limited bioavailability was considered when evaluating the exposures of receptors to site contaminants. Contaminants with generally less bioavailability are considered to be less toxic than the more bioavailable contaminants, all other factors being equal.

- More Appropriate Benchmarks: More appropriate benchmarks were used to further evaluate risks to specific groups of ecological receptors (e.g., plants, invertebrates, aquatic biota, and benthic organisms) because while screening levels are useful for initial screening, they are very conservative and not appropriate for evaluating all of the assessment endpoints.

TABLE 3B-1

SAMPLING TECHNIQUES
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND

Site	Soil		Sediment Samples	Groundwater Samples	Surface Water Samples
	Surface Samples	Subsurface Samples			
UXO-1	HA	DPT			
UXO-2	HA	DPT	PD	LOW FLOW	
UXO-4	HA	DPT		LOW FLOW	
UXO-5	HA	DPT			
UXO-10	HA	HA			
UXO-12		DPT	PD		SAMPLE CONTAINER
UXO-21	HA				
UXO-23		DPT			
UXO-28	HA				

TABLE 3B-2

FBL ANALYSES
NAVAL SUPPORT FACILITY INDIAN HEAD
INDIAN HEAD, MARYLAND

Site	Soil			Sediment Samples	Groundwater Samples	Surface Water Samples	Analyses	Duplicates
	Locations	Surface Samples	Subsurface Samples					
UXO-1	20	40	6	0	0	0	Explosives	3
UXO-2	40	80	40	7	6	0	Explosives and Metals	4
UXO-4	20	40	40	0	3	0	Explosives, Metals, VOCs	5
UXO-5	25	50	50	0	0	0	Explosives and Metals	6
UXO-10	15	30	29	0	0	0	Explosives	3
UXO-12	10	0	20	2	0	1	Explosives	3
UXO-21	21	41	0	0	0	0	Explosives	2
UXO-23	10	0	20	0	0	0	Explosives and Metals	1
UXO-26	No Sampling Performed							
UXO-28	20	40	0	0	0	0	Explosives and Metals	2

4.0 AIR BLAST POND – UXO-1

4.1 LOCATION AND SETTING

The Air Blast Pond is an earthen pit in a 3.7-acre range located approximately 100 feet north of Chicamuxen Creek, and is accessed by a dirt road that intersects Archer Avenue. The area surrounding the Air Blast Pond is wooded. Two intermittent streams are present at the range.

ABP-1. Vegetation Surrounding the Air Blast Pond

4.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

The buildings associated with the Air Blast Pond have been demolished, and no buildings remain at the range. Based on installation maps and interviews, it is estimated that the buildings were demolished in the mid-1990s. A sanitary sewer line runs through the Air Blast Pond. The sanitary sewer line was probably left in place after the buildings were demolished. The construction plans identify a septic field near the buildings and an 8-inch storm drain leading to Chicamuxen Creek. Prior to construction of the Air Blast Pond, the area was undeveloped. A 1949 map showing the conditions at Stump Neck lists this area as “cultivated.” From 1955 to 1975, the range was used by the Naval Ordnance Laboratory (NOL) for testing bulk high explosives. After the NOL relocated the training to Dahlgren, the buildings were

demolished. The Air Blast Pond and surrounding area are currently unused. According to the installation, there are no planned changes at the Air Blast Pond.

ABP-3. Current View of Berm, Stairs, and Concrete Tank

4.3 TOPOGRAPHY

The topography of the Air Blast Pond is dominated by the earthen berm, and elevations at the site range from 0 to 50 feet above msl. The berm slopes steeply from 16 to 50 feet above msl. The area surrounding the Air Blast Pond is relatively level at approximately 16 feet above msl.

4.4 GEOLOGY

Subsurface conditions at the Air Blast Pond were investigated through the drilling and logging of four soil borings during the 1998 Resource Conservation and Recovery Act (RCRA) Facility

Investigation/Verification Investigation (RFI/VI). The subsurface materials were relatively consistent across the area, both vertically and horizontally. The material encountered in and beneath the berm generally consisted of a 9- to 12-foot thickness of natural, reworked material classified as silty sand, and was generally underlain by sand and gravel. The fill material used to construct the berm was obtained from a borrow pit immediately west of the pond. The northern portion of the area was underlain by silty clay. No waste material was reported to have been encountered during the 1998 RFI/VI subsurface investigation. In this SI investigation, the shallow borings were tagged as silty sand grading into a sandy/silty clay at approximately 4 feet bgs. As described in Section 2.2.3 - Regional Geology, in most of the study area, the surficial sediments consist of Pleistocene paleochannel deposits and Holocene alluvial and paludal deposits (Hiortdahl, 1997). These deposits consist of gravel, sand, silt, clay, and peat mixtures with irregular bedding and with an aggregate thickness of 0 to approximately 40 feet. Appendix F.1 includes the boring logs and Appendix F.2 includes the soil and sediment log sheets for UXO-01.

4.5 SOIL AND VEGETATION

According to the Soil Survey of Charles County, the predominant soil type associated with the Air Blast Pond is sand-silt to sand-clay (USDA, 1974). Specifically, Keyport silt loam with a 2 to 5 percent slope is present. Vegetation surrounding the Air Blast Pond is primarily woodland, with grassland surrounding the access road and location of the former buildings.

4.6 HYDROLOGY

An intermittent unnamed tributary runs along the northwestern edge of the Air Blast Pond and empties into Chicamuxen Creek. A smaller intermittent unnamed tributary south of the pit runs perpendicular to and intersects the larger stream approximately 75 feet before it empties into Chicamuxen Creek. Chicamuxen Creek discharges to the Potomac River.

4.7 HYDROGEOLOGY

No monitoring wells were installed at the Air Blast Pond during the RFI/VI. Based on topography and the proximity to Chicamuxen Creek, shallow groundwater is presumed to flow toward and discharge into Chicamuxen Creek. As a result of the nature of historical activities at the Air Blast Pond, the pond likely discharged large volumes of water into the subsurface through infiltration.

4.8 WETLANDS

There are no known wetlands at Air Blast Pond.

4.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

According to the 2003-2004 Stump Neck Annex Hunting Map, hunting is permitted at the Air Blast Pond. The Chicamuxen WMA is located on the opposite side of Chicamuxen Creek from the Air Blast Pond. Although the potential for cultural resources exists for the area in which the range is located, there have not been any specific archeological or cultural sites identified at the Air Blast Pond. Approximately 30 shovel tests were conducted in this area in August 1996 during the Phase I Cultural Resources Survey of Stump Neck Annex and Supplemental Architectural Investigations. No sites were identified on the Maryland Register of Historic Places (State Register) or the National Register of Historic Places.

4.10 HISTORICAL INFORMATION

The Air Blast Pond is an earthen pit in a 3.7-acre site located in the central portion of NSF Indian Head, Stump Neck Annex. The Air Blast Pond was previously used to test the concussive factors of bulk explosives. The bulk test explosives were suspended on cables between two 97-foot-tall towers over a water-filled, man-made earthen pit (pond) approximately 100 feet in diameter, and were detonated above and in the water. The resulting repercussion factors in the water were measured, and the tests were observed on the range and recorded by the NOL. According to the 1998 RFI/VI, three to four detonation events (shots) were conducted per day, and maximum charge weights were 8 pounds per shot. The unit hosted an estimated 1,500 shots over 20 years of usage (1955 to 1975). The pit area has been drained of water and is overgrown with small trees. Rusted metal piping is present on the pit floor, and piping and wires are present in the pit berms. Steel cylinders, rusted drums, concrete and wooden platforms, and other structure debris are present in the wooded area immediately south of the pit. During the 2003 PA visual survey, a fired 57-mm projectile was observed on the northern side of the berm, and a C-4 end cap was observed on the southwestern portion of the berm. The source of the 57-mm projectile is unknown because its use is inconsistent with bulk explosives testing. Therefore, the Air Blast Pond is regarded as a suspected MEC site. The Air Blast Pond is overlapped by the firing fan from The Valley Impact Area located at NSF Indian Head, Main Installation. Thus, there is a potential for munitions associated with The Valley Impact Area to be present at the Air Blast Pond. Information on The Valley Impact Area is provided in Section 12.1 of this SI report. The northern portion of the Air Blast Pond is overlapped by the Marine Rifle Range. The Air Blast Pond is not suspected to contain chemical warfare material (CWM)-filled munitions, electrically fused munitions, or depleted uranium (DU)-associated munitions.

4.11 MUNITIONS USED

The explosives tested include Pentolite, HBX-1, HBX-2, H-6, C-4, and Composition B. Although the Air Blast Pond was designed to capture the detonations within the pond, the nature of the operations conducted at the range produced a spray of detonated explosives (MC) during testing.

4.12 MUNITIONS CONSTITUENTS

Based on the explosive detonations historically conducted at the Air Blast Pond, suspected MC in the area include the following:

- Pentolite [a mixture of TNT and pentoerythrol tetronitrate (PETN)].
- HBX-1 (a mixture of RDX, TNT, and aluminum).
- HBX-2 (a mixture of RDX, TNT, and aluminum).
- H-6 (a mixture of RDX, TNT, and aluminum).
- C-4 (a mixture of RDX and plasticizer, over 90 percent of which is RDX).
- Composition B (a 59/40/1/ mixture of RDX, TNT and beeswax).

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 4-1.

4.13 PREVIOUS INVESTIGATIONS

Limited sampling of surface soil, subsurface soil and sediment was conducted during the 1998 RFI/VI. No groundwater samples were collected during the 1998 RFI/VI.

Five initial field screening samples (one at 6 to 12 inches bgs, one at 12 to 24 inches bgs, and three at 0 to 6 inches bgs) were collected from three locations within the pond. These samples were analyzed using field test kits sensitive to the explosives TNT and RDX. Four samples were then collected from locations surrounding the pond and were analyzed using the field test kits. Explosives were not detected in any of these samples.

Seven surface soil samples and seven subsurface soil samples were collected and analyzed for Appendix IX metals, Appendix IX VOCs, Appendix IX semi-volatile organic analyte (SVOA), and explosives (Figure 10.1-14 of the UFP SAP). Of these seven surface soil samples, three (ABPSS01 through ABPSS03) were collected from locations within the pond, and four (ABPSS04 through ABPSS07)

were collected from the top of the berm. The seven subsurface soil samples were collected from four soil borings (ABPSB01 through ABPSB04) which were advanced at locations in the top of the berm equidistant around the pond. Four sediment samples (ABPSD01 through ABPSD04) were also collected and analyzed for Appendix IX metals, Appendix IX VOCs, Appendix IX SVOA, and explosives.

Two VOCs, 3 semivolatile organic compounds (SVOCs), and 15 inorganics were detected in surface soil (0 to 2 feet bgs). No VOCs or SVOCs were present in surface soil at concentrations in excess of RBCs or SSLs. Arsenic was the only inorganic in surface soil detected at concentrations that exceeded the RBC for industrial exposures. Two VOCs, one SVOC, and 13 inorganics were detected in subsurface soil (2 to 12 feet bgs), none at concentrations in excess of RBCs or SSLs. Two VOCs, 15 SVOCs, and 14 inorganics were detected in sediment samples. Arsenic was the only analyte in sediment detected at concentrations that exceeded the RBC for industrial exposures (3.8 mg/kg). No explosives were detected in any of the samples (Table 10.1-1 of UFP SAP). Arsenic in surface soil and sediment was therefore determined to be the only COPC. However, the maximum concentration detected (9.6 mg/kg) is similar to the 95 percent upper tolerance limit value established for base-wide background surface soil (4.25 mg/kg), and to background soil concentrations reported for the State of Maryland (7.1 mg/kg). Therefore, as a result of the soil and sediment investigation at the Air Blast Pond, no further action was recommended in the 1998 RFI/VI. Since the Air Blast Pond is located within the estimated firing fan from The Valley Impact Area, located at the Main Installation, there is a potential for munitions associated with The Valley Impact Area to be present at the Air Blast Pond. Refer to Section 12.1 of this report for information on The Valley Impact Area. Only the munitions constituents that specifically relate to the Air Blast Pond are considered.

4.14 MEC SITE FIELDWORK

4.14.1 Background

The area immediately surrounding the 57-mm projectile's location is a known MEC area, and the remainder of the Air Blast Pond is considered a suspect MEC area. Geophysical surveying was not considered an option because of the excessive amount of metal debris scattered throughout the area. Therefore, the MEC site inspection at the Air Blast Pond during this SI was limited to a UXO detector-aided surface sweep, which was conducted over 100 percent of the accessible portions of the 3.72-acre site.

The initial horizontal boundary for the MEC investigation included the Air Blast Pond and the area surrounding the pond identified in the PA as the suspect MEC area (see Figure 4-1).

The initial vertical boundary for the MEC investigation (detector-aided surface sweep) was 1 foot bgs. The theoretical penetration depth for the 57-mm projectiles similar to the one observed during the site walks is up to 6.5 feet bgs. However, it is unlikely that the projectile's presence was the result of the Air Blast Pond being used as an impact area. It is probably present as the result of operations occurring on the surface.

4.14.2 Scope

The scope of survey activities at the Air Blast Pond is summarized below (see Figure 4-1).

- Brush cutting as necessary to support the detector-aided surface sweeps as described in Section 3a.2.3.

- UXO detector-aided surface sweeps covering 100 percent of all accessible areas.

- Consultation with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with separate UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH Installation Restoration (IR) Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items left in place were avoided during subsequent operations at the site. No MEC items were moved or disturbed during this phase of the project.

4.14.3 Site Preparation

Brush cutting and vegetation removal to support the detector-aided surface sweeps were conducted to the degree necessary to allow the metal detector to get within a few inches of the ground surface. The magnetic detector is approximately 1 inch in diameter and is durable; therefore, it is possible to push the detector through brush and vegetation, and as a result, less brush cutting and vegetation removal is required. The all-metals detector has a detection head of approximately 8 inches and is more fragile than the magnetometer. Therefore, brush and vegetation was cleared to within a few inches of the ground surface.

4.14.4 UXO Detector-Aided Surface Survey

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix E.

Detector-aided surface sweeps were conducted of the accessible area designated within the PA as suspect for MEC (Figure 4-1). The sweep was conducted by UXO technicians in 5-foot wide transects using hand-held all-metals detectors (White's) and magnetic locators (Schonstedt, GA-52CX). The detector-aided surface sweep was initially conducted using a magnetic locator (magnetic gradiometer) Schonstedt GA-52CX instrument. During the surface sweep, when visual observations or other information indicated that non-ferrous metals from suspect MEC may be present, the all-metals detector White's Spectrum XLT was used. The all-metals detector was either used in place of, or in conjunction with, the magnetic locator. The decision as to whether one or both detectors were used was based on the ability to place the sensor of the all-metals detector within 1 foot of the ground surface, the relative proportion of ferrous items to non-ferrous items, and the types of items visually observed and their relative potential to be MEC or MPPEH.

A grid (100-foot sides) was pre-established. The grid nodes were staked in the field using a GPS instrument. In clear areas, stakes were placed at 5-foot intervals on opposite sides (north - south sides) or (east – west) and ropes were stretched from one side to the other to establish 5-foot wide lanes. In heavily vegetated areas, where stretching of ropes was not feasible, technicians walked side-by-side at 5–foot intervals. The general UXO detector aided survey was conducted as described in Section 3a.3. Locations where visual observations of suspect MEC, MPPEH, MD or subsurface anomalies were observed were marked with a pin-flag. Pictures were taken of items observed on the surface. In clear areas the locations were recorded using a GPS. In areas where tree canopy precluded use of a GPS, locations were established using a tape measure and compass measurements from a known location(s). All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures. The MEC hazard assessment methodology is described in Section 3a.5. MEC documentation is described in Section 3a.7.

4.15 DEVIATIONS FROM WORK PLAN

There were no deviations from the Work Plan.

4.16 MEC SURVEY RESULTS

The Air Blast Pond boundary was set and all skid steer brush cutting completed on November 20, 2009. Remaining brush cutting in the Air Blast Pond area was completed on January 13, 2010 with the weedeaters and chainsaw.

On January 13, 19, 20, and 21, 2010, the UXO Team swept the Air Blast Pond using Schonstedt GA-52CX and White's XLT. On January 21, 2010, one munitions debris (MD) item (a 500- bomb casing) was discovered on the surface located near the EOD School Demolition Area 120 feet northwest of the pond rim location (see photo in Appendix D). The MD item was described as a rusted, warhead section, and is believed to be an empty Tiny Tim rocket warhead.

Figure 4-2 illustrates the Air Blast Pond MEC Finds Location. The MEC finds from the PA are also shown on Figure 4-2. Table 4-2 and Table ES-2 list the MD find, which is labeled as ABP-01. The Field Forms and the UXO Surface Survey Activities, which are summarized from the daily and weekly logs at the Air Blast Pond, are included in Appendix C. The Air Blast Pond survey was completed January 21, 2010. A subsurface geophysical survey was not performed.

4.17 MC SAMPLING PROGRAM

Information from the detector-aided surface sweep was utilized to identify surface and subsurface MC soil sampling locations areas, based on the presence of MD and shallow subsurface anomalies, to determine if contamination exists. Tetra Tech consulted with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with separate UFP SAP). A total of 45 soil samples were collected at 20 locations at the Air Blast Pond. Table 4-3 lists the sampling locations and the justification for the selection of those locations.

If no suspect MEC, MPPEH, or subsurface anomaly clusters were observed, the samples were collected at the UFP SAP proposed locations. Figure 4-3 illustrates the sampling locations in conjunction with the MEC detector-aided surface sweep findings at the Air Blast Pond. All soil samples were collected via hand auger and DPT and submitted to the fixed-base laboratory for explosives analysis. Three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis.

The CSM (detailed in Appendix B of Volume I of the UFP SAP) indicated that potentially complete exposure pathways existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist. The updated CSM is described in Section 4.22.

4.17.1 MC Sample Collection and Analysis

Soil sample locations were selected based on a bias towards areas that were believed to be most likely contaminated by past operations at the site. The total area of the site is 3.72 acres as indicated in Table ES-1. See Figure 4-3 for all sample locations. Prior to initiating sample collection, all sample locations were marked by colored pin flags bearing the sample location ID number. Sample locations identified in the approved UFP SAP were located by GPS and by measurements from stationary objects (e.g., roadways, existing buildings). All sample locations were collected as proposed in the approved UFP SAP.

1. Surface and Subsurface Soil
   a) Thirty-nine surface soil samples were collected at the 0- to 6-inch and 0- to 24-inch bgs levels at 20 sample locations. The 0- to 6-inch bgs interval is of interest for ecological risk screening while the 0- to 24-inch bgs interval is of interest for the human health risk screening.

Surface soil samples at each location sampled were composites of seven discrete samples collected using the seven-point wheel approach. Explosives present on the surface would have resulted from low order detonations which released particles of explosives. These particles would be heterogeneously distributed in surface soil. In order to form a composite in which explosives would be evenly dispersed, the entire composite was processed in the laboratory using the methodology described in Appendix A of SW-846 Method 8330B. This methodology consists of air drying and sieving the entire sample and conducting particle size reduction (grinding) of the entire sample.

b) Six of the 20 surface sample locations were selected for discrete subsurface soil sampling at depths of 2 to 4 feet bgs based on the discretion of the FOL: X01SB0020204, X01SB0030204, X01SB0110204, X01SB0120204, X01SB0180204, and X01SB0190204. Specific locations were determined by the project team based on the results of the detector-aided surface sweeps. Samples were preferentially collected at locations where suspect MEC, MPPEH, or MD were located on the surface or where shallow subsurface anomalies were detected. Subsurface samples at each location consisted of one discrete sample. Subsurface soil samples were analyzed for explosives using SW 846 Method 8330B.

c) Two soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

d) Surface soil samples were collected via hand auger.

e) Subsurface soils were collected via DPT.

f) Because the Air Blast Pond is a suspect MEC area and is located in the fan of the Valley Impact Area, anomaly avoidance techniques were used for collection of samples.

4.18 WORK PLAN DEVIATIONS

Surface soil sample X01SB0090024 was not collected because of saturated soil conditions.

4.19 SITE INSPECTION DATA COLLECTION RESULTS

4.19.1 MC Sampling Results

All soil samples collected were compared to the PALs and background sampling results, and a statistical evaluation was done to compare the background data with the site sampling results. The summary tables of the site background screening and PALs are presented in Appendix H and the MC analytical results are also presented in Appendix H. The data validation reports are presented in Appendix I. The statistical summary and calculations are presented in Appendix J. Table 4-4 summarizes the results as compared to the calculated screening values for explosives in surface soil. Table 4-5 summarizes the results as compared to the calculated screening values for explosives in subsurface soil. The PAL was the reference limit, unless the background and screening calculations exceeded this value.

4.20 DATA PRESENTATION/DATA USABILITY

4.20.1 Data Quality Review of Samples at Air Blast Pond

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for the Air Blast Pond were of acceptable quality for use in decision-making. The review began with data validation, which is a comparison of DQIs against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as “U,” “J”, “R,” “L”, “K”, or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the DQOs of the project. The DQOs presented in the Munitions Response Program Site Inspections at Ten Munitions Response Program Ranges QAPP (September 2009) were maintained through the course of the sampling event. The Worksheets #19 and #15 of the QAPP present the analytical methods and compounds analyzed.

Table 1 in Appendix I presents all the qualified data and the reason for the data qualification. The rejection of data was not necessary for samples collected at the Air Blast Pond and all data are considered valid for their intended purpose.

Soil saturation prevented the collection of sample X01SS0090024. The sample completeness was 98%. The laboratory analytical completeness was 100%.

There are instances where the non-detected sample results exceed the PQLGs because the laboratory did not use enough sample volume. All project action limits (PALs) were met. Because all the PALs were met no impact on data quality is expected due to exceedances of the PQLGs.

Table 1 in Appendix I shows that several results were qualified because of LCS and calibration noncompliances. The noncompliances in general do not show any directional bias with the data except for HMX. HMX had laboratory control sample (LCS) recoveries less than the laboratory quality control limit but greater than 30% indicating a slight low bias. Overall, the laboratory accuracy was acceptable and no data were rejected. There was no quality control deficiencies noted for field accuracy.

No data were qualified due to laboratory or field duplicate precision noncompliances.

No comparability issues were noted during the data validation process.

Based on field logs indicating the conditions during sample collection and laboratory audits all reported data are adequately representative of site conditions and intended populations.

4.21 DATA COMPARISON TO PROJECT ACTION LIMITS

Thirty-nine composite surface (0- to 6-inch and 0- to 24-inch bgs) and six discrete subsurface (2- to 4-feet bgs) soil samples were sent to the FBL for explosives analyses using SW 846 Method 8330B.

4.21.1 Surface Soil

Table 4-4 summarizes the results as compared to the calculated screening values for explosives in surface soil. The PALs were not exceeded at any composite surface soil sampling locations. Nitroglycerin was detected at three composite surface soil sampling locations ranging from 0.09J mg/kg at X01SS0180006, 0.095J mg/kg at X01SS0010006, and 0.14J mg/kg at X01SS0190006. These detections are well below the nitroglycerin PAL of 0.61 mg/kg. No other explosives were detected in the composite surface soil samples.

4.21.2 Subsurface Soil

Table 4-5 summarizes the results as compared to the calculated screening values for explosives in subsurface soil. Explosives were not detected at any discrete subsurface soil sampling locations.

No Human Health Risk Screening, Ecological Screening, or statistical calculations were performed since there were no exceedances of the PALs for any Explosive parameter.

4.21.3 CEC, pH, and TOC

One representative soil sample per sampling depth (0 to 2 feet and 2 to 4 feet) was shipped to the FBL for CEC, pH, and TOC analyses. CEC was detected at 57.4 milliequivalent (mEq)/100 at X01SS0110024 and 42.4 mEq/100 at X01SB0020204. PH was detected at 4.53 standard units (S.U.) at X01SS0110024 and 4.85 S.U. at X01SB0020204. TOC was detected at 3340 mg/kg at X01SS0110024 and 919 mg/kg at X01SB0020204. There are no PALs for CEC, pH, or TOC. The surface background TOC is 57,200 mg/kg and the subsurface background TOC is 66,500 mg/kg. Neither value was exceeded. The mobility of metals is influenced by pH and CEC. CEC is a calculated value that is an estimate of the ability of the soil to attract, retain, and exchange cations. Soils with CEC above 10 mEq have a higher clay content and a lower sand content with many positions to hold cations. In general, metal cations are most mobile under acidic conditions, and a pH of 7 is neutral. The pH level in this sample would be considered acidic. The mobility of metals generally increases with decreasing soil pH and CEC. TOC is a measure of the total amount of nonvolatile, volatile, partially volatile, and particulate organic compounds in a sample.

4.22 UPDATED CONCEPTUAL SITE MODEL

Only MC associated with the Air Blast Pond are considered in the CSM exposure pathway analysis. This general description of the CSM exposure pathway analysis was included in Section 10.1.11 of the UFP SAP: "At the Air Blast Pond, evidence found during the 2003 visual survey suggests that MEC may be present; however, the density of the MEC is not known. Therefore, potentially complete pathways exist for human and ecological receptors for MEC in subsurface soil. This includes receptors for hand/tread underfoot contact and surface intrusive work that may be conducted at the Air Blast Pond. These activities include, but are not limited to, excavation, plowing, tilling, construction, and environmental sampling for human receptors. Ecological receptors may come in contact with MEC through burrowing, nesting, or feeding activities that disturb surface soil. Trespassers are anticipated to be exposed via non-intrusive surface soil activities at the range, but it is unlikely they would be exposed to subsurface soil through intrusive activities. MEC are not expected in the subsurface." This CSM exposure pathways analysis focuses only on the Air Blast Pond and does not consider impacts from The Valley firing fan. For exposure pathway analysis for The Valley Impact Area, refer to Section 12.20 of this SI report. Figure 4-4 is a three-dimensional depiction of the CSM for the Air Blast Pond Site. Figure 4-4A is a three-dimensional close-up CSM depiction of the pond area at the Air Blast Pond Site. Structures associated

with the pond still exist; however, they are in disrepair. These structures include a wooden observation platform, stairs, a wooden bunker, and a concrete and wooden tank with platform, as shown on Figure 4-4A. Figures 4-4 and 4-4A detail the potential exposure sources, pathways, and receptors.

Based on sampling results from the 1998 RFI/VI, there are no MC present at the Air Blast Pond (see Section 4.10). Therefore, an MC exposure pathway analysis diagram was not drawn.

No chemicals were retained as COPCs. Therefore, neither a Human Health Risk Exposure Summary nor an Ecological Risk Exposure Summary were performed.

4.23 EXPOSURE PATHWAY ANALYSIS

Figure 4-5 graphically presents an Exposure Pathway Analysis for MEC. The exposure sources appear to be limited. One pathway is runoff from precipitation, however groundwater is not used at the site. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses.

At the Air Blast Pond, evidence found during the 2003 visual survey suggests that MEC may be present; however, the density of the MEC is not known. The SI MEC surface survey logged one MD item. Therefore, potentially complete pathways exist for human and ecological receptors for MEC in subsurface soil. This includes receptors for hand/tread underfoot contact and surface intrusive work that may be conducted at the Air Blast Pond. These activities include, but are not limited to, excavation, plowing, tilling, construction, and environmental sampling for human receptors. Ecological receptors may come in contact with MEC through burrowing, nesting, or feeding activities that disturb surface soil. Trespassers are anticipated to be exposed via non-intrusive surface soil activities at the range, but it is unlikely they would be exposed to subsurface soil through intrusive activities. MEC are not expected in the subsurface.

4.24 CONCLUSIONS

MEC

One munitions debris item was discovered on the surface. Its appearance was detailed as a rusted, warhead section. A subsurface geophysical survey was not performed.

The MEC Exposure Pathway Analysis indicated that potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses.

MC

No further action was recommended in the 1998 RFI/VI, as a result of the soil and sediment investigation at the Air Blast Pond. The MC sampling results from this SI investigation confirms this conclusion. Explosive analyses for soil samples collected in this SI did not result in any exceedances of the PALs.

4.25 RECOMMENDATIONS FOR NEXT PHASE

MEC

Proceed to an RI. The RI should include:

- Clearance of surface MEC/MPPEH and non-munition debris.
- Subsurface geophysical investigation.
- Investigation of representative subset of subsurface anomaly discovered during the geophysical investigation.

MC

- No further action is recommended, however MC sampling if subsurface MEC/MPPEH are found.

TABLE 4-1

MUNITION TYPES AND CHEMICALS
AIR BLAST POND - UXO 01
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MUNITIONS TYPES USED/STORED AT THE FACILITY	ASSOCIATED CHEMICAL CONSTITUENTS
TNT	2,4,6-trinitrotoluene
RDX	Cyclotrimethylenetrinitramine
PETN	Pentaerythritol tetranitrate
Pentolite	Mixture of TNT and PETN
HBX-1	Mixture of RDX, TNT, and aluminum
HBX-2	Mixture of RDX, TNT, and aluminum
H-6	Mixture of RDX, TNT, and aluminum
C-4	Mixture of RDX and plasticizer, over 90 percent is RDX
Composition B	59/40/1/ mixture of RDX, TNT and beeswax

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 4-2

AIR BLAST POND
MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

FACILITY	Stump Neck Annex of Indian Head MD
SITE NUMBER & NAME	112G00810 MMRP Site Investigation

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition (indicate w/			Notifications Completed (indicate w/ √ as applicable)	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
01/21/2010	1400	Air Blast Pond	ABP-01			X	322847.86	1248262.99	Tiny Tim Rocket,	Rusted,			01/21/2010	X	ABP-01

TABLE 4-3

MC SAMPLING PROGRAM
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Sampling Locations	Justification
X01SB001	MPPEH Location
X01SB002	Check Sampling
X01SB003	Check Sampling
X01SB004	Check Sampling
X01SB005	Check Sampling
X01SB006	Check Sampling
X01SB007	Check Sampling
X01SB008	Check Sampling
X01SB009	Check Sampling
X01SB010	Check Sampling
X01SB011	Check Sampling
X01SB011	Check Sampling
X01SB012	Check Sampling
X01SB013	Check Sampling
X01SB014	Check Sampling
X01SB015	Check Sampling
X01SB016	Check Sampling
X01SB017	Check Sampling
X01SB018	Check Sampling
X01SB019	Check Sampling
X01SB020	Check Sampling

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

parameter			x01ss00100		x01ss00102		x01ss00200		x01ss00202		x01ss00300		x01ss00302		x01ss00400		x01ss00402		x01ss00500	
nsample			X01SS0010006		X01SS0010024		X01SS0020006		X01SS0020024		X01SS0030006		X01SS0030024		X01SS0040006		X01SS0040024		X01SS0050006	
location			X01SB001		X01SB001		X01SB002		X01SB002		X01SB003		X01SB003		X01SB004		X01SB004		X01SB005	
project_no			00810_2010060		00810_2010060		00810_2010052		00810_2010052		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010052	
sample_coc			X01SS0010006		X01SS0010024		X01SS0020006		X01SS0020024		X01SS0030006		X01SS0030024		X01SS0040006		X01SS0040024		X01SS0050006	
gis_date			20100317		20100317		20100316		20100316		20100317		20100317		20100317		20100317		20100316	
qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
duplicate																				
top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50	
depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
z			001		003		005		007		009		011		013		015		017	
x	utl95cv	minorpal	c_001		c_003		c_005		c_007		c_009		c_011		c_013		c_015		c_017	
Explosives (mg/kg)																				
1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
1,3-DINITROBENZENE	NA	0.61	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U
2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
2-NITROTOLUENE	0.15	2.9	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
3,5-DINITROANILINE	NA	NA	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U
3-NITROTOLUENE	NA	0.61	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
4-NITROTOLUENE	0.21	30	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
HMX	NA	380	0.19	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U
NITROBENZENE	NA	0.023	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
NITROGLYCERIN	NA	0.61	**0.095**	**J**	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
PETN	NA	NA	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	U
RDX	NA	5.5	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
TETRYL	NA	24	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
Miscellaneous																				
CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
PERCENT MOISTURE (%)	NA	NA																		
PH (s.u.)	8.8	NA																		
TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TOTAL SOLIDS (%)	79.2	NA																		

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

parameter			x01ss00502		x01ss00600		x01ss00602		x01ss00700		x01ss00702		x01ss00800		x01ss00802		x01ss00900		x01ss01000	
nsample			X01SS0050024		X01SS0060006		X01SS0060024		X01SS0070006		X01SS0070024		X01SS0080006		X01SS0080024		X01SS0090006		X01SS0100006	
location			X01SB005		X01SB006		X01SB006		X01SB007		X01SB007		X01SB008		X01SB008		X01SB009		X01SB010	
project_no			00810_2010052		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060	
sample_coc			X01SS0050024		X01SS0060006		X01SS0060024		X01SS0070006		X01SS0070024		X01SS0080006		X01SS0080024		X01SS0090006		X01SS0100006	
gis_date			20100316		20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317	
qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
duplicate																				
top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		0.50	
depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
z			019		021		023		025		027		029		031		033		035	
x	utl95cv	minorpal	c_019		c_021		c_023		c_025		c_027		c_029		c_031		c_033		c_035	
Explosives (mg/kg)																				
1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
1,3-DINITROBENZENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.24	U	0.24	U	0.24	U	0.23	U	0.23	U	0.25	U	0.24	U	0.25	U
2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
2-NITROTOLUENE	0.15	2.9	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.24	U	0.24	U	0.23	U	0.23	U	0.25	U	0.24	U	0.25	U
3-NITROTOLUENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
4-NITROTOLUENE	0.21	30	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
HMX	NA	380	0.2	U	0.19	UL	0.2	UL	0.19	UL	0.19	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
NITROBENZENE	NA	0.023	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
NITROGLYCERIN	NA	0.61	1.2	U	1.1	U	1.2	U	1.2	U	1.1	U	1.1	U	1.2	U	1.2	U	1.2	U
PETN	NA	NA	1.2	U	1.1	UJ	1.2	UJ	1.2	UJ	1.1	UJ	1.1	U	1.2	U	1.2	U	1.2	UJ
RDX	NA	5.5	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
TETRYL	NA	24	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U
Miscellaneous																				
CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
PERCENT MOISTURE (%)	NA	NA																		
PH (s.u.)	8.8	NA																		
TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TOTAL SOLIDS (%)	79.2	NA																		

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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parameter			x01ss01002		x01ss01100		x01ss01102		x01ss01200		x01ss01202		x01ss01300		x01ss01302		x01ss01400		x01ss01402	
nsample			X01SS0100024		X01SS0110006		X01SS0110024		X01SS0120006		X01SS0120024		X01SS0130006		X01SS0130024		X01SS0140006		X01SS0140024	
location			X01SB010		X01SB011		X01SB011		X01SB012		X01SB012		X01SB013		X01SB013		X01SB014		X01SB014	
project_no			00810_2010060		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010060		00810_2010060	
sample_coc			X01SS0100024		X01SS0110006		X01SS0110024		X01SS0120006		X01SS0120024		X01SS0130006		X01SS0130024		X01SS0140006		X01SS0140024	
gis_date			20100317		20100316		20100316		20100316		20100316		20100316		20100316		20100317		20100317	
qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
duplicate																				
top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00	
depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
z			037		039		041		043		045		047		049		051		053	
x	utl95cv	minorpal	c_037		c_039		c_041		c_043		c_045		c_047		c_049		c_051		c_053	
Explosives (mg/kg)																				
1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3-DINITROBENZENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2-NITROTOLUENE	0.15	2.9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
4-NITROTOLUENE	0.21	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
HMX	NA	380	0.19	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	UL
NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
PETN	NA	NA	1.2	UJ	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ
RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
TETRYL	NA	24	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Miscellaneous																				
CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA					57.4													
PERCENT MOISTURE (%)	NA	NA					17													
PH (s.u.)	8.8	NA					4.53													
TOTAL ORGANIC CARBON (mg/kg)	57200	NA					3340													
TOTAL SOLIDS (%)	79.2	NA					**83 [BKG]**													

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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parameter			x01ss01500		x01ss01502		x01ss01600		x01ss01602		x01ss01700		x01ss01702		x01ss01800		x01ss01802		x01ss01803	
nsample			X01SS0150006		X01SS0150024		X01SS0160006		X01SS0160024		X01SS0170006		X01SS0170024		X01SS0180006		X01SS0180024		X01SS0180024-AVG	
location			X01SB015		X01SB015		X01SB016		X01SB016		X01SB017		X01SB017		X01SB018		X01SB018		X01SB018	
project_no			00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052	
sample_coc			X01SS0150006		X01SS0150024		X01SS0160006		X01SS0160024		X01SS0170006		X01SS0170024		X01SS0180006		X01SS0180024		X01SS0180024-AVG	
gis_date			20100316		20100316		20100316		20100316		20100316		20100316		20100316		20100316		20100316	
qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG	
matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
duplicate																				
top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		2.00	
depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
z			055		057		059		061		063		065		067		069		070	
x	utl95cv	minorpal	c_055		c_057		c_059		c_061		c_063		c_065		c_067		c_069		c_070	
Explosives (mg/kg)																				
1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3-DINITROBENZENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2-NITROTOLUENE	0.15	2.9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
4-NITROTOLUENE	0.21	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
HMX	NA	380	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
NITROGLYCERIN	NA	0.61	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	**0.09**	**J**	1.2	U	1.2	U
PETN	NA	NA	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
TETRYL	NA	24	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Miscellaneous																				
CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
PERCENT MOISTURE (%)	NA	NA																		
PH (s.u.)	8.8	NA																		
TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TOTAL SOLIDS (%)	79.2	NA																		

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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parameter			x01ss01805		x01ss01900		x01ss01901		x01ss01903		x01ss01906		x01ss02000		x01ss02002	
nsample			X01SS0180024-D		X01SS0190006		X01SS0190006-AVG		X01SS0190006-D		X01SS0190024		X01SS0200006		X01SS0200024	
location			X01SB018		X01SB019		X01SB019		X01SB019		X01SB019		X01SB020		X01SB020	
project_no			00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052	
sample_coc			FD031610-05		X01SS0190006		X01SS0190006-AVG		FD031610-04		X01SS0190024		X01SS0200006		X01SS0200024	
gis_date			20100316		20100316		20100316		20100316		20100316		20100316		20100316	
qc_type			FD		NM		NM		FD		NM		NM		NM	
sacode			DUP		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL	
matrix			SO		SO		SO		SO		SO		SO		SO	
duplicate			X01SS0180024						X01SS0190006							
top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00	
bottom_dep			2.00		0.50		0.50		0.50		2.00		0.50		2.00	
depth_unit			FT		FT		FT		FT		FT		FT		FT	
z			072		075		076		078		081		083		085	
x	utl95cv	minorpal	c_072		c_075		c_076		c_078		c_081		c_083		c_085	
Explosives (mg/kg)																
1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U	0.24	U	0.25	U
2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U	0.24	U	0.25	U
3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	**0.14**	**J**	**0.14**	**J**	1.1	U	1.2	U	1.2	U
PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U
RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U	0.2	U	0.2	U
Miscellaneous																
CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA			28.8		28.8									
PERCENT MOISTURE (%)	NA	NA			17		17									
PH (s.u.)	8.8	NA			4.18		4.18									
TOTAL ORGANIC CARBON (mg/kg)	57200	NA			6690		6690									
TOTAL SOLIDS (%)	79.2	NA			**83 [BKG]**		**83 [BKG]**									

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 4-5

SUBSURFACE SOIL SAMPLING RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			X01SB0020204		X01SB0030204		X01SB0110204		X01SB0110204-AVG		X01SB0110204-D	
	location			X01SB002		X01SB003		X01SB011		X01SB011		X01SB011	
	project_no			00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052	
	sample_coc			X01SB0020204		X01SB0030204		X01SB0110204		X01SB0110204-AVG		FD031610-01	
	gis_date			20100316		20100316		20100316		20100316		20100316	
	qc_type			NM		NM		NM		NM		FD	
	sacode			NORMAL		NORMAL		DUP		AVG		DUP	
	matrix			SO		SO		SO		SO		SO	
	duplicate											X01SB0110204	
	top_depth			2.00		2.00		2.00		2.00		2.00	
	bottom_dep			4.00		4.00		4.00		4.00		4.00	
	depth_unit			FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB	
	z			001		003		005		006		008	
cas	x	utl95	minorpal	c_001		c_003		c_005		c_006		c_008	
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
	Miscellaneous												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	42.4									
TTNUS288	PERCENT MOISTURE	NA	NA	17.1									
TTNUS002	PH (s.u.)	NA	NA	4.85									
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA	919									
TTNUS046	TOTAL SOLIDS (%)	NA	NA	82.9									

TABLE 4-5

SUBSURFACE SOIL SAMPLING RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

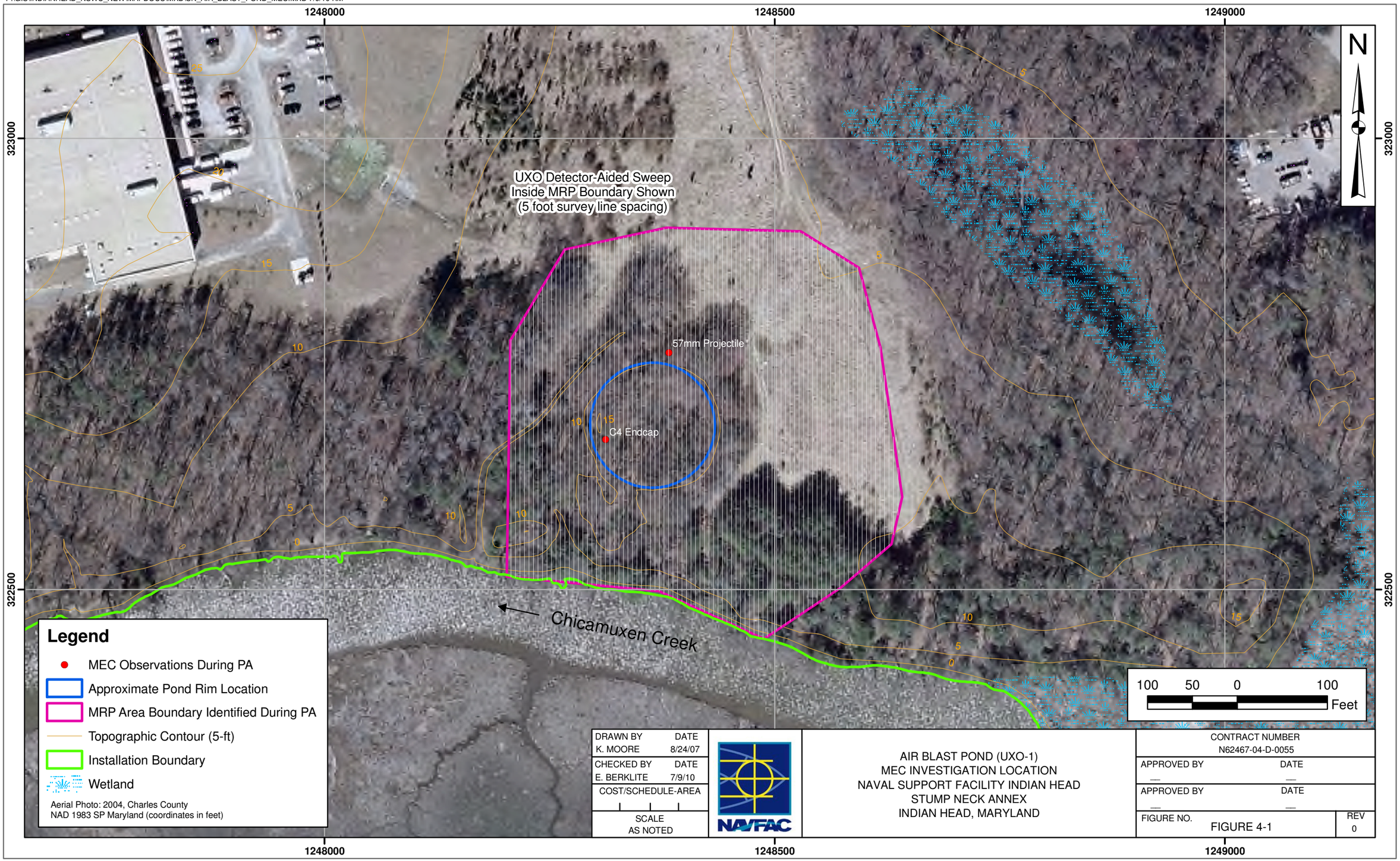
	nsample			X01SB0120204		X01SB0180204		X01SB0190204	
	location			X01SB012		X01SB018		X01SB019	
	project_no			00810_2010052		00810_2010052		00810_2010052	
	sample_coc			X01SB0120204		X01SB0180204		X01SB0190204	
	gis_date			20100316		20100316		20100316	
	qc_type			NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO	
	duplicate								
	top_depth			2.00		2.00		2.00	
	bottom_dep			4.00		4.00		4.00	
	depth_unit			FT		FT		FT	
	submatrix			SB		SB		SB	
	z			011		013		015	
cas	x	utl95	minorpal	c_011		c_013		c_015	
	Explosives (mg/kg)								
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U
	Miscellaneous								
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA						
TTNUS288	PERCENT MOISTURE	NA	NA						
TTNUS002	PH (s.u.)	NA	NA						
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA						
TTNUS046	TOTAL SOLIDS (%)	NA	NA						

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD\SN_AIR_BLAST_POND_MEC.MXD 7/9/10 KM



DRAWN BY / DATE	K. MOORE 8/24/07
CHECKED BY / DATE	E. BERKLITE 7/9/10
COST/SCHEDULE-AREA	
SCALE	AS NOTED

NAVFAC

AIR BLAST POND (UXO-1)
MEC INVESTIGATION LOCATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY / DATE	— / —
APPROVED BY / DATE	— / —
FIGURE NO.	FIGURE 4-1
REV	0

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1248000 1248500 1249000

323000

322500

N

57mm Projectile

C4 Endcap

Chicamuxen Creek

25 20 15 10 5 0 5 10 10 10 5 0 10 5 0 15

100 50 0 100 Feet

Legend

- MPPEH
- MEC Observations During PA
- Approximate Pond Rim Location
- MRP Area Boundary Identified During PA
- Topographic Contour (5-ft)
- Installation Boundary
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	1/29/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

AIR BLAST POND (UXO-1)
MEC FINDS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	
N62467-04-D-0055	
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 4-2	0

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1248000 1248500 1249000

323000 322500

N

X01SB001 X01SB002 X01SB003 X01SB004 X01SB005 X01SB006 X01SB007 X01SB008 X01SB009 X01SB010 X01SB011 X01SB012 X01SB013 X01SB014 X01SB015 X01SB016 X01SB017 X01SB018 X01SB019 X01SB020

57mm Projectile

C4 Endcap

Chicamuxen Creek

Legend

- Soil Sample Location
- Munitions Debris
- MPPEH
- MEC Observations During PA
- Approximate Pond Rim Location
- MRP Area Boundary Identified During PA
- Topographic Contour (5-ft)
- Installation Boundary
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

100 50 0 100 Feet

DRAWN BY K. MOORE	DATE 1/29/10
CHECKED BY E. BERKLITE	DATE 7/9/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

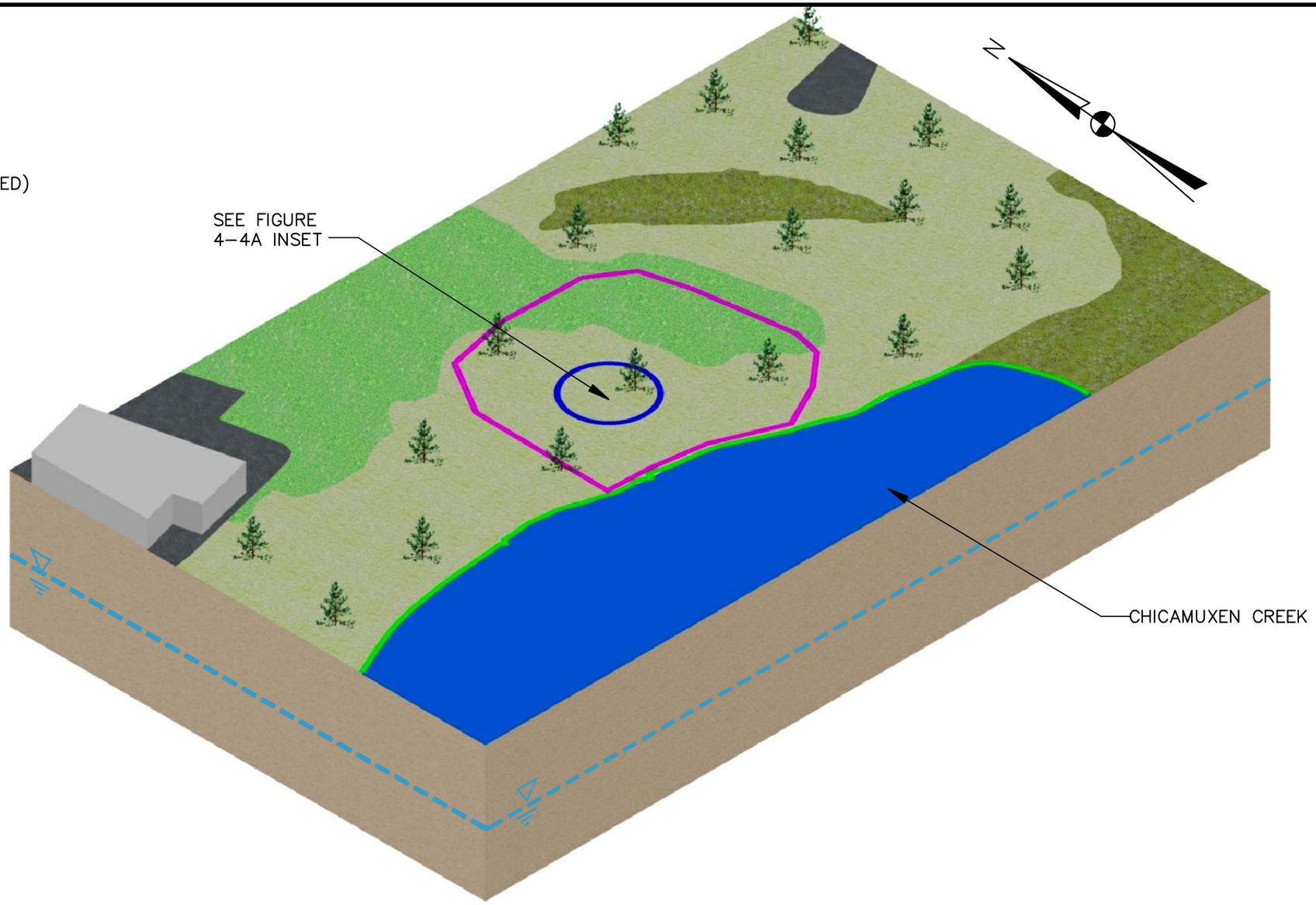
NAVFAC

AIR BLAST POND (UXO-1)
SAMPLE LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO.	FIGURE 4-3
REV	0

LEGEND

- MRP AREA BOUNDARY IDENTIFIED DURING PA
- INSTALLATION BOUNDARY
- APPROXIMATE POND RIM LOCATION
- WATER TABLE (ESTIMATED)
- BUILDINGS
- TREE
- GRASS
- PAVED ROAD
- FOREST
- WETLANDS
- WATER



CURRENT AND FUTURE RECEPTORS FOR STUMP NECK IMPACT AREA
HUMAN: –MILITARY/CIVILIAN PERSONNEL –CONTRACTORS –TRESPASSERS
ECOLOGICAL: –PLANTS –INVERTEBRATES –BIRDS –MAMMALS

DRAWN BY ND DATE 6–16–10	AIR BLAST POND UXO–1 CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND	CONTRACT NO. 0810
CHECKED BY DATE		OWNER NO.
REVISED BY DATE		APPROVED BY DATE
SCALE NOT TO SCALE		DRAWING NO. FIGURE 4–4 / REV. 0

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LEGEND

BUILDINGS

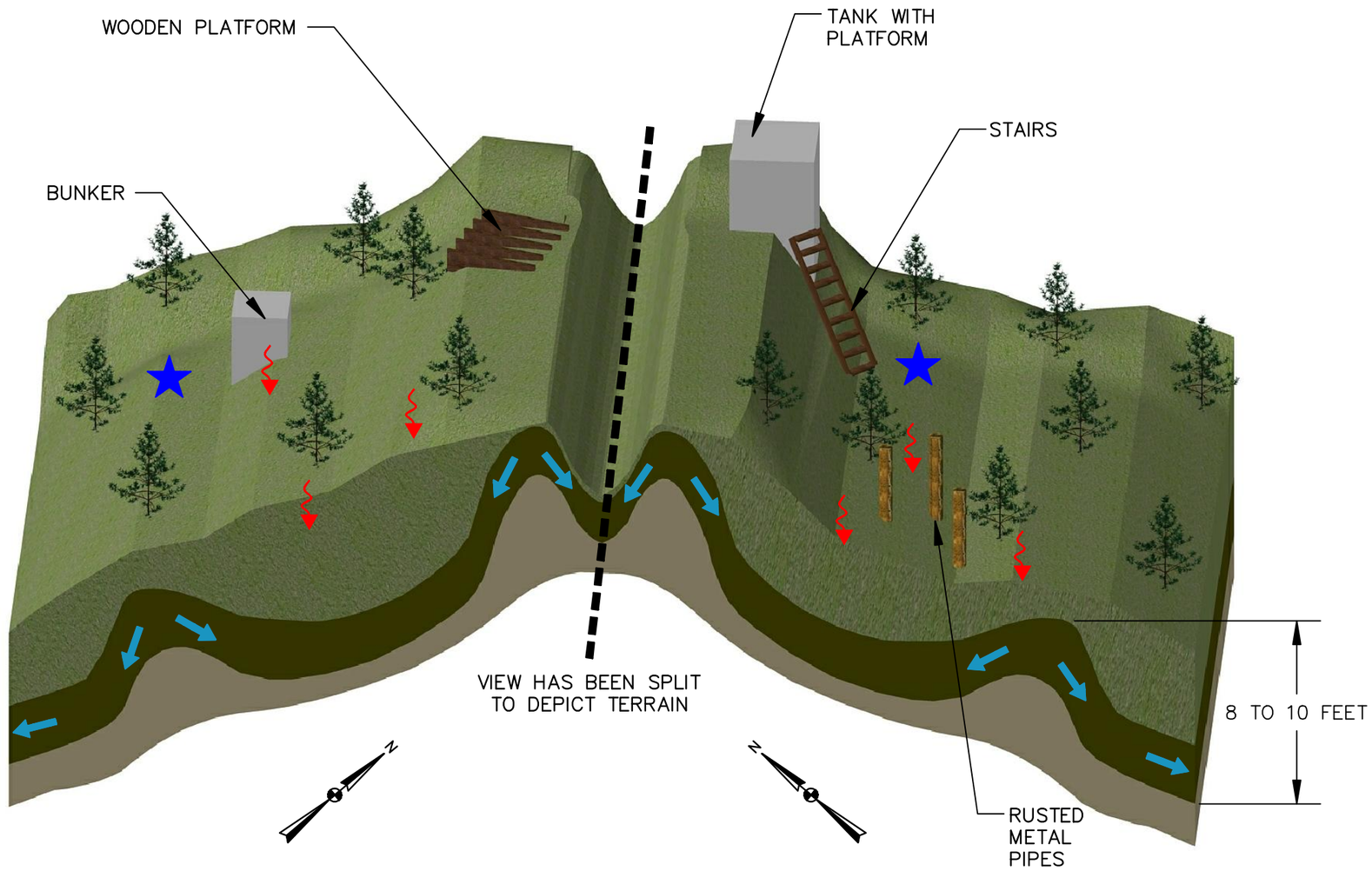
TREE

FOREST

ORDNANCE FOUND

INFILTRATION

GROUNDWATER FLOW DIRECTION



DRAWN BY ND DATE 6-22-10	NAVFAC	AIR BLAST POND DETAILED VIEW OF FORMER POND NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND	CONTRACT NO. 0810
CHECKED BY DATE			OWNER NO.
REVISED BY DATE			APPROVED BY DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 4-4A / REV. 0

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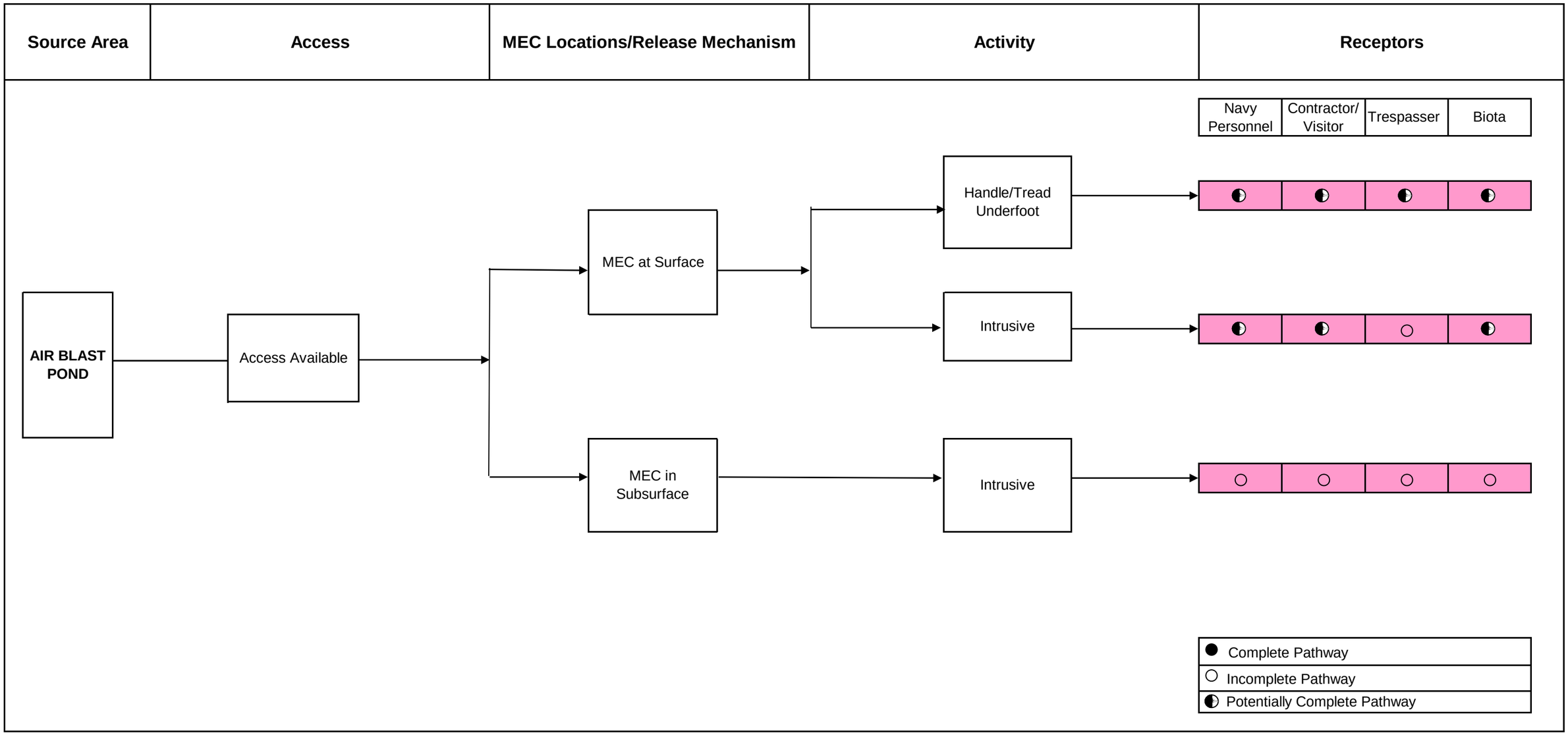
FIGURE 4-5

MEC EXPOSURE PATHWAY ANALYSIS

AIR BLAST POND UXO 01

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



5.0 AREA 8 – UXO-2

5.1 LOCATION AND SETTING

Area 8, the Underwater Ordnance Training Area, is a 22.6-acre range containing an explosives training pond in the central portion of the Stump Neck Annex south of Archer Avenue along Roach Road. Roach Road bisects Area 8 in an approximate north-to-south direction. Area 8 is surrounded by the former Munitions Disassembly Facility to the north, Chicamuxen Creek to the north and northwest, the current Munitions Disassembly Facility to the east, and undeveloped property to the south, northeast, and southwest.

Area 8-1. View of Pond at Area 8 and the Surrounding Vegetation

5.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

The Joint Services EOD Equipment Magnetic Evaluation Facility, Building 2210SN, is located within Area 8. A storage shed, Building 60SN, and a nonmagnetic tank, Building 65SN, are located at the pond. All other structures at the range have been demolished. When Area 8 was an active training area, Buildings 2104, 19SN, 60SN, 63SN, 65SN, 2077, 2078, 2079, 2080, and 2102 were in use. The Joint Services EOD Equipment Magnetic Evaluation Facility at Area 8 is serviced by electricity, potable water, and a

sanitary sewer. The training building (60SN) is also serviced by electricity. There is no readily available information on land use at the site prior to 1957, but based on historical maps, it is assumed that this area was undeveloped. From 1957 until 1999, the range was maintained as an underwater demolition training area for the EOD School. After the school relocated, the buildings were demolished to make way for the Joint Services EOD Equipment Magnetic Evaluation Facility, which was built in 2003. Navy personnel use the pond at Area 8 for recreational fishing and picnicking. The wooded area surrounding the pond and existing buildings is unused. According to the installation, there are no planned changes to activities at Area 8.

5.3 TOPOGRAPHY

The terrain at Area 8 is very steep and slopes from the southeast to the northwest. The high point of Area 8 is located in the southern portion of the range. The southern portion of the range slopes steeply downward toward the pond, which is located in the central portion of the range at an elevation of approximately 35 feet above msl. The northern portion of Area 8 has a more gradual downward slope towards Chicamuxen Creek and its surrounding wetlands in the northwestern portion of the range. Two acres of wetlands border the range to the northwest. Because of the topography of the area and the complete vegetative ground cover, severe erosion is not considered to be a problem.

5.4 GEOLOGY

Subsurface soil at Area 8 was classified based on data from three soil borings and three monitoring wells installed at the range during the 1995/1996 visual inspection (VI). The shallow subsurface geology of the study area, as observed from the boring logs, consists of silty sand with clay. The relative amounts of sand, silt, and clay vary somewhat at each location.

Site-specific geology was also classified for Area 8 during this SI's shallow subsurface boring investigation. The geology observed during boring installation was similar to what was recorded from the previous investigation detailed above. The relative amounts of sand, silt, and clay varied somewhat at each boring location. In general, the geology graded from a sandy/silty clay to a clayey/silty sand. Groundwater was encountered at the interval of this clayey/silty sand. As described in Section 2.2.3 - Regional Geology, in most of the study area, the surficial sediments consist of Pleistocene paleochannel deposits and Holocene alluvial and paludal deposits (Hiortdahl, 1997). These deposits consist of gravel, sand, silt, clay, and peat mixtures with irregular bedding and with an aggregate thickness of 0 to approximately 40 feet. Boring locations proposed near the wetlands were saturated at the surface. No

waste material was encountered during the shallow surface investigation. Soil and sediment log sheets are included in Appendix F.3. Boring logs are included in Appendix F.1.

5.5 SOIL AND VEGETATION

Area 8 is within a heavily wooded hardwood forest, except for cleared areas surrounding the pond and the on-range buildings, as well as the wetland areas in the northwestern portion of the range. There is minimal undergrowth on the slopes and more undergrowth, such as ferns, closer to the creek and wetlands. The wetland area on the range is classified by the installation as Palustrine forested broad-leaved deciduous wetland. Figure 5-1 shows the pond and surrounding woodland vegetation at Area 8. According to the Soil Survey of Charles County, soil at Area 8 is a mixture of Aura gravelly sandy loam with 5 to 10 percent slopes, Aura gravelly sandy loam with 10 to 15 percent slopes, and steep gravely land (USDA, 1974). The majority of the range has 5 to 10 percent slopes, including the central portion and the portion of the range west of Roach Road adjacent to Chicamuxen Creek. A small portion of the southeastern corner of the range has 10 to 15 percent slopes. The soils are moderately eroded with moderately slow permeability (range cm/sec), moderate available moisture capacity (range), and suitability for building and woodland. A section of steep gravely land extends on a north-to-south line along the eastern boundary of the range. The gravel content of this unit ranges from about 20 to 80 percent by volume. Most of the gravel is quartz pebbles, and slopes range from about 15 to 20 percent. During construction of the Joint Forces EOD Equipment Magnetic Evaluation Facility in 2003, activities affecting the soil included earth movement and excavation of the top 6 feet of soil. It is not known if the excavated soil was transported off range or used as fill material on range during construction.

5.6 HYDROLOGY

Two acres of wetlands are located on and bordering the northwestern portion of Area 8. Chicamuxen Creek borders Area 8 to the northwest. Surface water from the range drains to the creek and wetlands, to the former training pond, and to drainage swales adjacent to Building 2210SN and its parking lot. The wetlands and Chicamuxen Creek drain to the Potomac River. A major portion of Area 8 is located within the 100-year floodplain.

Area 8-6. View of Building 2210SN Looking East from Roach Road

5.7 BACKGROUND HYDROGEOLOGY

Hydrogeological conditions at Area 8 have been interpreted from data obtained during the VI, during which three monitoring wells were installed at Area 8. The range is characterized by a shallow groundwater table contained within a silty sand with clay aquifer. The water table at Area 8 ranges from the surface at the wetlands located in the northwestern portion of the range, to 30 feet bgs. A potentiometric groundwater map created in 1995 shows groundwater flowing toward the wetlands to the northwest at a gradient of approximately 0.047. Rising-head and falling-head slug tests performed in 1995 showed the average hydraulic conductivity to be 1.47 feet per day. Using these values and an effective aquifer porosity of 30 percent, groundwater velocity was calculated to be 84 feet per year. Background hydrogeology is included in Appendix F.13. The SI hydrogeology is discussed further in Section 5.25.

5.8 WETLANDS

The wetlands located on the northwestern edge of the range are protected under Executive Order 11990, which prohibits construction in a wetland area unless there is no practicable alternative and all possible measures are taken to minimize the environmental impacts. Wetlands are also protected under Section 404 of the Clean Water Act, which requires a permit to be obtained from the USACE before any

work in a wetland can commence. The wetlands at Area 8 are classified as Palustrine forested broad-leaved deciduous wetland.

The 100-year floodplain that covers a major portion of Area 8 is protected under Executive Order 11988, which restricts development within the 100-year floodplain to water-dependent activities. Any construction within the floodplain must be in accordance with regulations promulgated by the Federal Insurance Administration pursuant to the National Flood Insurance Act of 1968. Permits for construction within the 100-year floodplain are also required and are administered by the Waterway Permits Division of the Maryland Department of Natural Resources.

5.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

Because the majority of the range is undeveloped, some wildlife species do exist at the range. The pond at Area 8 is also stocked for fishing. According to the 2003 Stump Neck Annex Hunting Map, hunting is not permitted at Area 8. The Chicamuxen WMA is located approximately 1,000 feet downstream of Area 8. Although the potential for cultural resources exists for the area in which the range is located, there have not been any specific archeological or cultural sites identified near the range. A total of 70 shovel tests were conducted in this area during the 1996 Phase I Cultural Resources Survey of Stump Neck Annex and Supplemental Architectural Investigations. A single isolated artifact, a fragment of quartz block/shatter, was recovered from Area 8. The survey concluded that such an isolated prehistoric artifact probably reflects nothing more than a single episode of tool curation or cobble testing. No sites were identified on the Maryland Register of Historic Places (State Register) or the National Register of Historic Places.

5.10 HISTORICAL INFORMATION

Area 8 consists of approximately 23 acres of wooded area and a small developed area (with buildings and parking lot) with an explosives training pond to the south. Inert ordnance items limited to no more than 0.5 pounds of explosives were used at Area 8 for the training of EOD personnel. Explosives are listed in Section 5.11.

Approximately 12 classes each year from 1957 to 1999 used the render-safe training locations at Area 8. Half-pound TNT explosive charges were placed at 6 to 9 feet below the ground surface in holes (a few feet in diameter) that were filled with surface water to a depth of 4 to 5 feet for the water shots. The explosive charge was placed in the hole between 2 and 5 feet below the water surface. EOD students would work on the inert training item at a safe distance of about 30 feet from the water shot explosive

charge location. Similar charges were used for the air shots, which had the explosive charges suspended on a wire approximately 2 feet above the ground surface. Students would work on a connected but inert training item at a distance of 75 feet from the air shot explosive charge location.

The pond at Area 8 contained 10 to 15 inert torpedoes and mines placed at the pond bottom for student training in performing diving and reconnaissance operations. Additional EOD training was performed at the pond edge. The pond is now stocked and used for fishing.

From 1978 to 1999, a 100-foot-long portion of Chicamuxen Creek in Area 8 was used for training students with a half-buried inert mine on the creek bottom to simulate the conditions of reconnaissance and ordnance problem-solving in muddy waters.

5.11 MUNITIONS USED

The following explosive devices were used at Area 8:

- TNT block.
- PETN .
- Military Dynamite.
- Demolition charges: primers, blasting caps, detonators, fuzes, and squibs.
- HMX.

It has been estimated that 50 to 75 pounds of ordnance (net explosive weight) were used at this training facility annually from 1957 to 1999. Based on the information obtained during the data collection process, Area 8 is not suspected to contain CWM-filled munitions, electrically fuzed munitions, or DU-associated munitions.

5.12 MUNITIONS CONSTITUENTS

Historically identified MC in Area 8 includes:

- TNT block - (2,4,6-trinitroluene).

- PETN - (pentaerythritol tetranitrate).

- Military Dynamite - 75 percent RDX, 15 percent TNT, 5 percent motor oil, and 5 percent cornstarch.

- Demolition charges: primers, blasting caps, detonators, fuzes, and squibs- blackpowder (potassium nitrate, sulphur, charcoal or coal, nitrocellulose), metals, chloroform, bis(2 ethylhexyl) phthalate (BEHP).

- HMX (Octogen) - a powerful and relatively insensitive nitroamine high explosive, chemically related to RDX.

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 5-1.

5.13 PREVIOUS INVESTIGATIONS

The 1995/1996 VI included the sampling of soil, sediment, surface water, and groundwater. Twenty-five of the most used water and air shot locations (surface water and sediment from the water shot locations and surface soil from the air shot locations) were sampled and analyzed by field test-kit screening for the presence of TNT, HMX, and RDX.

The results of the field screening analyses were used to guide the locations of the soil boring and monitoring wells. Three soil borings and three monitoring wells were installed to evaluate the potential for soil contamination. A boring (S25-SB01) was installed at the most used air shot location (24B). Borings S25-SB02 and S25-SB03 were selected based on the results of the field screenings at air shot locations 36/37B and 44/48B. Visual observations and Photo-ionization Detector (PID) readings of soil from the borings did not identify any apparent contamination. Monitoring well S25-MW1 was installed adjacent to water shot location 7A, and monitoring well S25-MW02 was drilled adjacent to water shot location 7B. Monitoring well SB5-MW03 was installed upgradient of all water and air shot locations to characterize background soil and groundwater.

Two soil samples were collected from each soil and well boring for laboratory analysis, one from the 0 to 2 feet bgs and one from just above the water table.

A set of four surface water and sediment samples was collected for field test-kit screening and laboratory analysis. Sets of surface water and sediment samples were collected from: water shot location 7B, water shot location 23B, Chicamuxen Creek adjacent to water shot location 7A, and Chicamuxen Creek upstream of all water and air shot locations.

The laboratory-analyzed soil samples contained no SVOCs or energetic compounds. TNT and RDX were identified in surface soil field screening samples [at 0.5 to 1.5 parts per million (ppm)]; however, all detected concentrations were less than Region 3 RBCs for RDX and TNT. Metals were detected in soil samples at levels equal to or greater than two times background concentrations. The maximum metals concentrations were detected in subsurface soil samples, particularly in the sample collected at the most-used air shot location (SB01). Chloroform and BEHP were the only target analyte organics detected in groundwater, and no energetic compounds were detected in groundwater at Area 8. Metals concentrations in unfiltered groundwater samples exceeded primary federal standards. Groundwater constituent concentrations were generally greater in samples from upgradient monitoring well samples, which may indicate that groundwater at Area 8 has not been affected by range activities. BEHP, 4-amino-2,6-dinitrotoluene (an energetic compound), and metals were detected in Area 8 surface water. Benzo(a)pyrene, BEHP, naphthalene, phenanthrene, and metals were detected in sediment samples at Area 8. TNT and RDX were detected in surface water and sediment field screening samples at concentrations from less than 5 to 15 parts per billion (ppb).

Based on the historical uses of Area 8, associated MC include TNT, PETN, military dynamite (75 percent RDX, 15 percent TNT, 5 percent motor oil, and 5 percent cornstarch), and metals. The 1990 Environmental Regulation of Ordnance and Ordnance Ranges states that the following ordnance items (and quantities) were expended annually at Area 8: M041 TNT half-pound block (1,030 each); M591 M-1 Dynamite (120 each); and M130 Electric Blasting Caps (1,090 each). There are no records of EOD responses for training at Area 8. Technical data for the associated MC are provided in Appendix D of the UFP SAP.

5.14 MEC SITE FIELD WORK

5.14.1 Background

The objectives of the SI were to delineate the surface distribution and extent of suspect MEC across accessible portions of the site and the subsurface distribution of suspect MEC in the areas around the old shot hole, air-shot and water-shot locations, and Chicamuxen Creek and the Area 8 Pond where EOD training took place. Therefore, detector-aided surface sweeps were conducted to aid in the delineation of the distribution and extent of suspect surficial MEC and subsurface MEC. Geophysical surveys were planned, if needed, to investigate large subsurface anomalies discovered during the detector-aided surface surveys to locate and further define buried metallic objects that could represent suspect MEC.

Based on the areal extent and the location of shallow subsurface anomalies identified during the detector-aided surface sweeps, it was determined that it was not necessary to conduct a subsurface geophysical investigation. Shallow subsurface anomalies were present; however, the SI MC investigation was planned to incorporate the locations of identified anomalies. The MEC site investigation at Area 8 was limited to detector-aided surface investigations.

Tetra Tech conducted UXO detector-aided sweeps of areas where water shots were located to search for possible caches of items to depths dependent on the quantity and volume of the metal that could be present. In addition, UXO detector-aided sweeps of the pond and creek were conducted to search for caches of inert training items possibly discarded there. The training items were the focus of the detector-aided surface sweeps and not the MEC explosive shots, because the MEC explosive shots (or small charges) were not expected to have physical properties that would allow them to be detected by the UXO sweep or geophysics survey. Any munitions training item discovered on site were treated as suspect MEC and was not moved or disturbed during this phase of the project.

The design of the explosive shot locations (less than 0.5 pounds each) was configured to contain most of the detonation products; however, the detonation shot operations may have produced a localized spray of detonated explosives (MC) in the immediate vicinity of the shot point during the training and resultant detonation activities.

Suspect MEC on the surface were delineated on the surface, and the amount of near surface suspect ferrous MEC across the accessible portions of selected water shot cluster areas was determined. Subsurface anomalies were located that could possibly represent MEC at selected anomaly clusters detected by the UXO detector-aided sweep. Anomalies were also located that could possibly represent MEC (if present) in the existing pond that was used for training exercises.

A sonar survey of the pond was conducted to search for inert training devices discarded at the bottom of the pond.

The initial horizontal boundary for the MEC investigation included the area shown on Figure 5-1.

The initial vertical boundary for the MEC investigation (detector-aided surface sweeps and possible geophysical subsurface investigation) was 6 feet bgs within the land area. It is reported that explosives at Area 8 were placed at 2 to 5 feet below the water surface in the 6 to 9 foot deep water shot locations.

5.14.2 Scope

The scope of survey activities at Area 8 is summarized as follows (see Figure 5-1):

- Brush and vegetation clearing as necessary to support the detector-aided surface sweeps as described in Section 3a.2.3.

- 100-Percent UXO detector-aided surface sweeping of the accessible areas encompassing the water-shot locations and Old Shot Hole.

- UXO detector-aided sweeping of the pond and the section of Chicamuxen Creek within the MRP site boundary identified in the PA Report to search for possible inert training devices using a 5-foot survey line spacing.

- UXO detector-aided surface sweeping of four parallel transects spaced 15 feet apart providing reconnaissance coverage over numerous air-shot locations (shown on Figure 5-1).

- Consulting with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with separate MC UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH IR Coordinator and then to the Tetra Tech UXO Manager. No MEC items were moved or disturbed during this phase of the project. Surface MD were reported on the log sheet or in the logbook for the site.

5.14.3 Site Preparation

The site is mostly wooded, and required brush and vegetation cutting. These areas were clear-cut of brush smaller than 2 inches in diameter and other vegetation to a level no greater than 12 inches above the ground surface to permit the passage of the survey equipment. Trees and brush 2 inches and larger were not cut. The survey crew worked around these obstacles.

5.14.4 UXO Detector-Aided Surface Survey

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix E.

Detector-aided surface sweeps were conducted of the established survey areas as shown on Figure 5-1. The sweeps were conducted by UXO Technicians, using hand held magnetic metal detectors (Schonstedt GA-52Cx), in areas where water shots were located and at the Old Shot Hole. While the UFP SAP called for a UXO detector-aided surface survey of four parallel transects spaced 15 feet apart to provide reconnaissance coverage over the air shot locations, the nature of the terrain and locations of the air shot sites dictated that the UXO team create and mark boundaries grouping the air shot locations into clusters prior to conducting the detector-aided surface surveys. There were three cluster survey areas created (see Figure 5-1) and these areas received 100 percent detector-aided survey coverage during the SI. This approach, as opposed to plotting, marking, and surveying over 120 separate transects, was more effective and covered more of the required survey area.

MEC detector-aided surface survey activities at Area 8 included 100 percent coverage in the areas encompassing the water-shot locations and Old Shot Hole.

The general UXO detector-aided survey was conducted as described in Section 3a.3. Locations where visual observations of suspect MEC, MPPEH, MD or subsurface anomalies are observed were marked with a stake. Pictures were taken of items observed on the surface. In clear areas the locations were recorded using a GPS. In areas where tree canopy precluded use of a GPS, locations were established using a tape measure and compass measurements from a known location(s). All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures. The MEC hazard assessment methodology is described in Section 3a.5. MEC documentation is described in Section 3a.7.

5.14.5 UXO Detector-Aided Sweep of the Pond and Chicamuxen Creek

An underwater, subsurface, magnetic locator instrument operated from a 15-foot flat bottom boat was used to detect and locate large anomalies on the bottom of the pond and along the edge of Chicamuxen Creek. The data were collected along parallel survey lines spaced 5 feet apart using ropes anchored to the land or buoys placed across the pond to provide navigation. Anomaly locations were surveyed using GPS. Survey line spacing was chosen to provide sufficient coverage for detecting large items or caches of items.

5.15 DEVIATIONS FROM WORK PLAN

The UFP SAP called for individual transects around the air shot locations to be marked and surveyed. Actual field conditions dictated that the air shot locations be grouped together. There were three groupings in all, and each received 100 percent survey coverage (see discussion in Section 5.14.4). Yellow areas show "clusters/groupings" of survey areas that were developed for the air shot locations and blue areas show "clusters/groupings" of survey areas that were developed for the water shot locations instead of 15 foot spaced transects (Figure 5-1).

On January 7, 2010, it was noted that Transect 17 was inaccessible because of swampy conditions.

5.16 MEC SURVEY RESULTS

The MEC site investigation at Area 8 was limited to detector-aided surface investigations. The surface anomalies and anomaly clusters identification were sufficient to determine the MC sampling locations.

The Field Forms are included in Appendix C. The UXO Surface Survey Activities from the daily and weekly logs at Area 8 are summarized below.

Throughout December 2009 and January 2010, the UXO Team performed brush cutting operations in Area 8 in the vicinity of the Old Shot Hole, Air Shot, and Water Blast locations.

On December 17, 2009, the Area 8 pond was swept and 33 anomaly coordinates were logged in the GPS. The boat operations magnetometer check of the pond at Area 8 was performed.

On December 18, 2009, the Area 8 portion of Chicamuxen Creek was swept and anomaly coordinates were logged in the GPS.

On January 18, 2010, the UXO Team swept 25 percent of areas encompassing water shot locations in Area 8 using Schonstedt 52Cx. One MD item located : from Area 8, Area 8-02; was identified as a chemical switch/horn for a sea mine made of lead, filled with plaster of paris.

On January 19, 2010, one MD item from Area 8, Area 8-02 was identified as a chemical switch/horn for a sea mine.

On January 21, 2010, while performing QC sweeps, the UXO site officer (UXOSO)/QC located Area 8-03, a suspect MEC item (torpedo exploder). The suspect MEC item was marked and reported to the NSF-IH POC. UXO personnel were informed to stay out of the area until a disposition determination could be made regarding the item. Digital photographs were taken of the item and the GPS location was recorded; upon review of the pictures and closer inspection of the items by the SUXOS, UXO personnel were still unable to positively identify the hazards associated with the suspect MEC item. Notifications were made concerning this discovery. A Navy EOD team from Dahlgren was called to respond, and the team determined that the item was a Torpedo Exploder. The EOD Team considered the item safe to move but potentially hazardous. The team transferred the Torpedo Exploder to the Stump Neck's disassembly facility.

On January 23, 2010, the UXO Team swept in Area 8 using Schonstedt 52Cx. Eight MD items were located and the Area 8 surface survey was completed. Ferrous anomaly clusters were marked in GPS data.

During the UXO Survey on the Pond and Chicamuxen Creek, 34 anomalies were logged and recorded. One MEC item and 10 MPPEH items were discovered on the surface across the rest of Area 8. Identification of six subsurface anomaly clusters was performed using Schonstedt (Table ES-2). The MEC and MPPEH items found between January 18, 2010 and January 23, 2010 were described as bomb fuze parts, either at the surface or partially buried, and are described and shown on the spreadsheet in Appendix D –Site Photos.

Figure 5-2 illustrates the Area 8 MEC Finds/Subsurface Anomalies Locations. One MEC and ten suspect munitions debris items were discovered during detector-aided surface surveys of Area 8. Six of the 10 MPPEH items were located at the southernmost Air Shot area. The remaining four MPPEH items were located randomly throughout the Water Shot locations. The munitions debris was found at the northwest edge of the MRS boundary, approximately 100 feet from Chicamuxen Creek. Table 5-2 presents a summary of the MEC/MPPEH items identified at Area 8. the one MEC item is shown below.

5.17 MC SAMPLING PROGRAM

Information from the detector-aided surface sweep about the presence of MD and shallow subsurface anomalies was utilized to identify surface and subsurface MC soil sampling locations that could be used to determine if contamination exists. Tetra Tech consulted with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate UFP SAP). A total of 120 soil samples were collected at 40 soil sampling locations, 7 sediment samples were collected at 7 sediment sampling locations, and 6 groundwater samples were collected at 3 permanent and 3 temporary monitoring well locations at Area 8. Table 5-3 lists the soil sampling locations and the justifications.

If no suspect MEC, MPPEH, or subsurface anomaly clusters were observed, the samples were collected at the UFP SAP proposed locations. Figure 5-3 illustrates the sampling locations in conjunction with the MEC detector-aided surface sweep findings at Area 8. All soil samples were collected via hand auger

and DPT and submitted to the fixed-base laboratory for explosives and metals analyses. Three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis.

The CSM (detailed in Appendix B of Volume I of the UFP SAP) indicated that potentially complete exposure pathways existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist. The updated CSM is included in Section 5.26.

5.17.1 MC Sample Collection and Analysis

Soil sample locations were selected based on a bias towards areas that were believed to be most likely contaminated by past operations at the site. The total area of the site is 22.6 acres as indicated in Table ES-1. See Figure 5-3 for all sample locations. Prior to initiating sample collection, all sample locations were marked by colored pin flags bearing the sample location ID number. Collected sample locations identified in the approved UFP SAP were located by GPS and by measurements from stationary objects (e.g., roadways, existing buildings). All sample locations were collected as proposed in the approved UFP SAP.

1) **Surface Soil**

a) Eighty composite surface soil samples (7 aliquots each) were collected from two depths (0 to 6 and 0 to 24 inches bgs) at each of the 40 sample locations. The 0- to 6-inch bgs interval is of interest for ecological risk screening while the 0- to 24-inch bgs interval is of interest for the human health risk screening. Surface soil samples at each location sampled were composites of seven discrete samples collected using the seven-point wheel approach. Explosives present on the surface would have resulted from low order detonations which released particles of explosives. These particles would be heterogeneously distributed in surface soil. In order to form a composite in which explosives would be evenly dispersed, the entire composite was processed in the laboratory using the methodology described in Appendix A of SW-846 Method 8330B. This methodology consists of air drying and sieving the entire sample and conducting particle size reduction (grinding) of the entire sample. Surface soil samples were also analyzed for metals using SW 846 Method 6010B/6020A.

b) Surface samples were collected via hand auger.

2) **Subsurface Soil**

a) Twenty of the 40 soil sample locations were selected for discrete subsurface soil sampling by the planning team based on the presence of subsurface anomaly clusters. Subsurface soil samples were collected at depths of 2 to 4 and 4 to 6 feet bgs. Sixteen subsurface soil samples were collected via DPT and four subsurface soil samples were collected via hand auger. All subsurface soil samples were analyzed for explosives (SW 846 Method 8330B) and metals (SW 846 Method 6010B/6020A).

b) Three of the subsurface soil sampling locations were converted into temporary monitoring wells.

c) Subsurface soils were collected via DPT and temporary monitoring wells were installed via DPT.

3) **Groundwater**

a) Six groundwater samples were collected from three existing and three newly installed temporary wells at Area 8. The locations of the wells were determined based on the results of the detector-aided surface sweeps. Wells were placed in locations where the presence of anomalies indicated the potential for release of MC. Factors considered were the density of the anomalies, distances from existing wells, groundwater flow direction and MC data (if available). Groundwater samples were analyzed for explosives (SW 846 Method 8330B) and metals (SW 846 Method 6010B/6020A). The groundwater samples were filtered through a 0.45-micron filter if low-flow sample collection did not result in turbidity of less than 10 nephelometric turbidity units (NTUs) to obtain data on dissolved metals.

b) During groundwater well installation, a portion of the surface and subsurface soil samples (described above) were collected from well borings to characterize the nature of surface and subsurface soil at the well locations. One sample was collected at the surface and up to two samples were collected 2 feet from the water table, based on visual observations of staining or other relevant indications (odors, discoloration, etc.). Otherwise, the subsurface samples were collected at the water table and between the water table and surface. All soil samples were analyzed for explosives (SW 846 Method 8330B) and metals (SW 846 Method 6010B/6020A).

4) **Sediment**

a) Three sediment samples were collected at 0- to 6-inches below the sediment surface from areas within Chicamuxen Creek adjacent to where training was conducted. Four sediment samples were collected at 0 to 6 inches below the sediment surface from within the pond area. Specific locations were determined by the project team based on the results of detector-aided water sweeps. Samples were preferentially collected at locations where suspect MEC, MPPEH, or MD were located in the water or where anomalies were detected. Sediment samples at each location consisted of one discrete sample. If no suspect MEC, MPPEH, or MD were identified, then sediment samples were collected in the locations shown on Figure 17.2 of the UFP SAP [?]. Sediment samples were analyzed for explosives (SW 846 Method 8330B) and metals (SW 846 Method 6010B/6020A).

b) Sediment samples were collected via ponar dredge.

5) **Duplicates**

Four duplicate surface samples, one duplicate subsurface sample, one duplicate sediment, and one duplicate groundwater sample were collected.

Anomaly avoidance techniques were practiced during all sampling operations. Soil sample log sheets are included in Appendix F of this document.

5.18 WORK PLAN DEVIATIONS

There were no work plan deviations; however, there were noise restrictions in some areas where there are bald eagle nests (See figure in Appendix F.3, Background Hydrogeology Information) This restricted area was generally the area east of Roach Road and south of the parking and buildings. The subsurface sample locations in this area, X02SB024, X02SB031, X02SB35, and X02SB040, were acquired via hand auger.

5.19 SITE INSPECTION DATA COLLECTION RESULTS

5.19.1 MC Sampling Results

All soil and sediment samples collected were compared to the PALs and background sampling results, and a statistical evaluation was done to compare the background data with the site sampling results. The

summary tables of the site background screening and PALs are presented in Appendix H and the MC analytical results are also presented in Appendix H. The data validation reports are presented in Appendix I. The statistical summary and calculations are presented in Appendix J. Table 5-4 summarizes the results as compared to the calculated screening values for explosives and metals in surface soil. Table 5-5 summarizes the results as compared to the calculated screening values for explosives and metals in subsurface soil. Table 5-6 summarizes the results as compared to the calculated screening values for explosives and metals in sediment. Table 5-7 summarizes the results as compared to the calculated screening values for explosives and metals in groundwater. The PAL was the reference limit, unless the background and screening calculations exceeded this value. In Tables 5-4 through 5-7, if a parameter had an exceedance of the PAL and background screening values at any sampling point, the parameter is highlighted; individual sample exceedances are also highlighted.

5.20 DATA PRESENTATION/DATA USABILITY

5.20.1 Data Quality Review of Samples at Area 8

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for Area 8 were of acceptable quality for use in decision-making. The review began with data validation, which is a comparison of DQIs against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as “U,” “J,” “R,” “L,” “K,” or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the DQOs of the project. The DQOs presented in the Munitions Response Program Site Inspections at Ten Munitions Response Program Ranges QAPP (September 2009) were maintained through the course of the sampling event. The Worksheets #19 and #15 of the QAPP present the analytical methods and compounds analyzed.

Table 2 in Appendix I presents the rejected data for Area 8 samples. The matrix spike percent recovery for tetryl and 2,4,6-trinitrotoluene was less than 10 percent for four samples. The low matrix spike recovery resulted in the rejection of 5 out of 2,142 explosive results. These five explosives results are considered unusable. Table 2 presents all the qualified data and the reason for the data qualification. All data for samples collected at the Area 8, except for five explosive results, are considered valid for their intended purposes.

Five out of 2,142 explosive results were rejected because of a low matrix spike recovery. The laboratory completeness is 99.8 percent. The sample collection completeness is 100 percent.

There are instances where the non-detected sample results exceeded the project quantitation limit goals (PQLGs) because the laboratory did not use enough sample volume or because of sample dilution. For instances where the laboratory quantitation limit exceeded the risk screening criteria for COPC selection, one half of the laboratory QL was used.

Appendix I, Table 2 shows that one 2,4,6-trinitrotoluene and four tetryl results were rejected because of a matrix spike recovery less than 10 percent. There is a low bias for the tetryl and 2,4,6-trinitrotoluene results in the individual associated samples. The noncompliances listed in Table 2 show multiple qualifications for hold time, calibration, matrix spike recovery, LCS recovery, inductively coupled plasma (ICP) serial dilution, ICP interference, and internal standard noncompliances. Data qualified with "K" and "L" qualifiers indicate a high or low directional bias, respectively. There were no quality control deficiencies noted for field accuracy.

Several results for aluminum, antimony, arsenic, and aluminum were qualified because of a laboratory duplicate precision noncompliance. Several results for aluminum, barium, calcium, copper, iron, magnesium, and manganese were qualified because of a field duplicate precision noncompliance. Overall, the field and laboratory precision was acceptable and no data were rejected.

No comparability issues were noted during the data validation process.

Based on field logs indicating the conditions during sample collection and laboratory audits, all reported data are adequately representative of site conditions and intended populations.

5.21 DATA COMPARISON TO PROJECT ACTION LIMITS

Eighty composite surface soil samples (0 to 6 inch and 0 to 24 inch bgs), forty discrete subsurface (2 to 4 feet and 4 to 6 feet bgs) soil samples, seven discrete sediment samples, and six groundwater samples were sent to the FBL for explosives analyses using SW 846 Method 8330B and metals analyses (SW 846 Method 6010B/6020A).

5.21.1 Surface Soil

Table 5-4 summarizes the results as compared to the calculated screening values for explosives and metals in surface soil. The PAL was exceeded for one explosive constituent. Nitrobenzene exceeded the PAL of 0.023 mg/kg (background 95 percent UTL value was NA) at one composite surface soil sampling location, X02SS0300024, at an estimated concentration of 0.05 mg/kg. No other explosives were detected in the composite surface soil samples. Figure 5-4 illustrates the locations of the surface soil exceedances. All locations where subsurface soil samples were collected are located on this figure.

The PAL and background 95 percent UTL value was exceeded for eight metals constituents:

- Chromium exceeded the PAL of 26 mg/kg and background 95 percent UTL value of 33.4 mg/kg at one composite surface soil sampling location: X02SS0100024 at a concentration of 1570 (K) mg/kg.

- Copper exceeded the PAL of 28 mg/kg and background 95 percent UTL value of 20.3 mg/kg at three composite surface soil sampling locations: X02SS0190006 at a concentration of 65.5 mg/kg, X02SS0190024 at a concentration of 77.4 mg/kg, and X02SS0370006 at an estimated concentration of 28.8 mg/kg.

- Lead exceeded the PAL of 11 mg/kg and background 95 percent UTL value of 62.5 mg/kg at one composite surface soil sampling location: X02SS0090006 at a concentration of 72.1 mg/kg.

- Lithium exceeded the PAL of 2 mg/kg (background 95 percent UTL value was NA) at all 80 composite surface soil sampling locations, ranging from a concentration of 2.6 mg/kg, to a concentration of 12.8 mg/kg at X02SS0090006.

- Magnesium exceeded the PAL of 4400 mg/kg and background 95 percent UTL value of 1620 mg/kg at one composite surface soil sampling location: X02SS0180006 at a concentration of 11700 (K) mg/kg.

- Mercury exceeded the PAL of 0.058 mg/kg and background 95 percent UTL value of 0.16 mg/kg at two composite surface soil sampling locations: X02SS0190006 at a concentration of 0.32 (L) mg/kg, and X02SS0190024 at a concentration of 0.18 (L) mg/kg.

- Tin exceeded the PAL of 0.89 mg/kg (background 95 percent UTL value was NA) at five composite surface soil sampling locations: X02SS0090006 at an estimated concentration of 1.1 mg/kg,

X02SS0260024 at an estimated concentration of 0.95 mg/kg, X02SS0290006 at a concentration of 0.91 mg/kg, X02SS0300006 at an estimated concentration of 1.3 mg/kg, and X02SS0300024 at an estimated concentration of 1.2 mg/kg.

- Zinc exceeded the PAL of 46 mg/kg and background 95 percent UTL value of 37.5 mg/kg at one composite surface soil sampling location: X02SS0090006 at a concentration of 52.7 mg/kg.

5.21.2 Subsurface Soil

Table 5-5 summarizes the results as compared to the calculated screening values for explosives and metals in subsurface soil. Explosives were not exceeded at any discrete subsurface soil sampling locations. Figure 5-5 illustrates the locations of the subsurface soil exceedances.

The PAL and background 95 percent UTL value was exceeded for three metals constituents:

- Lithium exceeded the PAL of 2 mg/kg (background 95 percent UTL value was NA) at all forty discrete subsurface soil sampling locations, ranging from a concentration of 9 mg/kg, to a concentration of 36.8 mg/kg.

- Tin exceeded the PAL of 0.89 mg/kg (background 95% UTL value was NA) at one discrete subsurface soil sampling location: X02SB0070204 at an estimated concentration of 0.97 mg/kg.

- Zinc exceeded the PAL of 46 mg/kg and background 95% UTL value of 70.4 mg/kg at one composite surface soil sampling location: X02SB0310406 at a concentration of 77.8 (L) mg/kg.

5.21.3 Sediment

Table 5-6 summarizes the results as compared to the calculated screening values for explosives and metals in sediment. The PAL was not exceeded at any sediment sampling location for explosives. The PALs for all metals were exceeded; however, the background 95 percent UTL value was not exceeded for metals at any sediment sampling location.

5.21.4 Groundwater

Table 5-7 summarizes the results as compared to the calculated screening values for explosives and metals in groundwater. Explosives were not detected in groundwater. Figure 5-6 illustrates the locations

of the groundwater exceedances. The groundwater samples were labeled sequentially as follows for the permanent (installed in a previous investigation) and temporary (installed in this investigation) monitoring well locations:

Well Location	Groundwater Sample Identification
25MW001	X02GW001
25MW002	X02GW002
25MW003	X02GW003
X02TW001/SB032	X02GW004
X02TW002/SB029	X02GW005
X02TW003/SB012	X02GW006

The PAL (there were no background 95 percent UTL values) was exceeded for six unfiltered metals constituents and four filtered metals constituents.

Unfiltered metals:

- Aluminum exceeded the PAL of 50 µg/L at all six groundwater sampling locations, ranging from 60 (J) µg/L to 4300 µg/L.

- Arsenic exceeded the PAL of 0.045 µg/L at two groundwater sampling locations: X02GW006 (X02TW003/SB012) at a concentration of 1.4 (K) µg/L and X02GW005 at a concentration of 2.2 (K) µg/L.

- Cobalt exceeded the PAL of 1.1 µg/L at three groundwater sampling locations: X02GW001 (25MW001) at a concentration of 16 µg/L, X02GW005 (X02TW002/SB029) at an estimated concentration of 3.1 µg/L, and X02GW006 (X02TW003/SB012) at an estimated concentration of 4.7 µg/L.

- Iron exceeded the PAL of 300 µg/L at four groundwater sampling locations: X02GW001 (25MW001) at an estimated concentration of 1200 µg/L, X02GW004 (X02TW001/SB032) at an estimated concentration of 720 µg/L, X02GW005 at an estimated concentration of 5300 µg/L, and X02GW006 at an estimated concentration of 930 µg/L.

- Manganese exceeded the PAL of 50 µg/L at three groundwater sampling locations: X02GW001 (25MW001) at an estimated concentration of 110 µg/L, X02GW002 (25MW002) at an estimated concentration of 150 µg/L, and X02GW005 (X02TW002/SB029)at a concentration of 51 µg/L.

- Vanadium exceeded the PAL of 3.7 µg/L at two groundwater sampling locations: X02GW001(25MW001) at an estimated concentration of 6 µg/L, and X02GW005 (25MW002) at a concentration of 10 µg/L.

Filtered metals:

- Aluminum exceeded the PAL of 50 µg/L two groundwater sampling locations: X02GW001 (25MW001) at an estimated concentration of 240 µg/L, and X02GW005 (X02TW002/SB029) at an estimated concentration of 63 µg/L.

- Arsenic exceeded the PAL of 0.045 µg/L one groundwater sampling location: X02GW005 (X02TW002/SB029) at an estimated concentration of 1.2 µg/L.

- Cobalt exceeded the PAL of 1.1 µg/L at three groundwater sampling locations: X02GW001 (25MW001) at a concentration of 16 µg/L, X02GW005 (X02TW002/SB029) at an estimated concentration of 3 µg/L, and X02GW006 (X02TW003/SB012) at an estimated concentration of 4.9 µg/L.

- Iron exceeded the PAL of 300 µg/L three groundwater sampling locations: X02GW001 (25MW001) at an estimated concentration of 730 µg/L, X02GW005 (X02TW002/SB029) at a concentration of 3600 µg/L, and X02GW006 (X02TW003/SB012) at an estimated concentration of 610 µg/L.

Three soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

Statistical calculations were performed to evaluate the EPCs as discussed in Section 5.22 and included in Appendix J. These calculations were used to aid in the Human Health Risk Screening, which is included as Section 5.23. The Ecological Screening is included as Section 5.24.

5.21.5 CEC, pH, and TOC

One representative soil sample per sampling depth (0 to 2 feet, 2 to 4 feet, and 4 to 6 feet) was shipped to the FBL for CEC, pH, and TOC analyses. CEC was detected at 52.7 mEq/100 at X02SS0390024, 36.7 mEq/100 at X02SB0350204, and 43.9 mEq/100 at X02SB0350406. PH was detected at 4.59 S.U. at X02SS0390024, 4.43 S.U. at X02SB0350204, and 4.76 S.U. at X02SB0350406. TOC was detected at 3800 mg/kg at X02SS0390024, 2520 mg/kg at X02SB0350204 and 633 mg/kg at X02SB0350406. There are no PALs for CEC, pH, or TOC. The surface background TOC is 57,200 mg/kg and the subsurface background TOC is 66,500 mg/kg. Neither value was exceeded. The mobility of metals is influenced by pH and CEC. CEC is a calculated value that is an estimate of the ability of the soil to attract, retain, and exchange cations. Soils with CEC above 10 mEq have a higher clay content and a lower sand content with many positions to hold cations. In general, metal cations are most mobile under acidic conditions, and a pH of 7 is neutral. The pH level in this sample would be considered acidic. The mobility of metals generally increases with decreasing soil pH and CEC. TOC is a measure of the total amount of nonvolatile, volatile, partially volatile, and particulate organic compounds in a sample.

5.22 STATISTICAL EVALUATION

A 95 percent Upper Confidence Limit (UCL) is the upper bound of the associated confidence interval on the mean. Exposure assessment and cleanup decisions in support of U.S. EPA projects are often made based upon the mean concentrations of the contaminants of potential concern. A 95 percent *UCL* of the unknown population arithmetic mean is often used to estimate the EPC term (EPA 1992; EPA 2002). It is, therefore, important to compute a reliable, conservative, and stable 95 percent *UCL* of the population mean using the available data. There are several methods for calculating 95 percent UCLs depending on the data distribution that can be used to model the sample data and the amount of censoring that is present (percent of non-detected concentrations). For chemicals with maximum concentrations greater than the PAL or 95 percent background UTL, PRO UCL version 4.00.04 was used to calculate the appropriate UCL. Then the UCL was compared to the PAL. If the UCL was less than the PAL, it was determined that the chemical would not pose a risk. If the UCL was greater than the PAL, then it was determined that further evaluations should be conducted. The following values were calculated for UXO-02 subsurface soil.

Parameter	PAL (MG/KG)	Background	Maximum Concentration	EPC (mg/kg)
LITHIUM	2	NA	**36.8**	**16.1**
TIN	0.89	NA	**0.97**	**0.97**
ZINC	46	70.4	**77.8**	32.5

The bolded cells indicate that the UCL exceeds the PAL and the background concentration. Surface soil did not exceed any human health criteria, therefore was not evaluated.

5.23 HUMAN HEALTH RISK SCREENING EVALUATION

Subsurface soil samples at UXO 2 were analyzed for explosives and inorganics. Nitroglycerin and 21 inorganics were detected in the 40 subsurface soil samples collected at UXO 2. A comparison of the detected subsurface soil concentrations to screening levels is presented in Appendix K Table 5-1. Lithium was the only chemical detected at concentrations exceeding the direct contact human health screening levels.

HIs were estimated as shown on Appendix K Tables 5-2 and 5-3. Carcinogenic toxicity criteria are not available for lithium; consequently, ILCRs could not be estimated. The HIs for residential (HI = 0.1) and industrial (HI = 0.01) exposures to subsurface soil are less than the acceptable level of 1, indicating that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions.

5.24 ECOLOGICAL RISK SCREENING EVALUTION

5.24.1 COPCs Selection

Maximum chemical concentrations in surface soil and sediment were compared to the 95 percent UTL background concentration for NSF Indian Head (if available), and ecological screening levels for soil invertebrates, terrestrial plants, birds, mammals, and sediment invertebrates. Chemicals were selected as COPCs for soil invertebrates, plants, or sediment invertebrates if the maximum concentration exceeded both the background concentration (if available) and the screening level, or if a screening level was not available for that receptor. The screening levels for surface soil are provided Appendix L, Background and Calculations. Frequency of detection tables (fod) are also included in Appendix L.

Appendix L Table 5-1 also presents the chemicals selected for food chain modeling. Food chain modeling was conducted if the maximum detected concentration for a chemical exceeded the avian or mammal screening level. Food chain modeling was not conducted for chemicals without avian or

mammal screening levels, unless the chemical was considered an important bioaccumulative chemical (USEPA, 2006) or for chemicals detected at a maximum concentration less than the 95 percent UTL background concentration for NSF Indian Head (if available).

COPCs for Terrestrial Invertebrates and Plants

Appendix L Table 5-2 presents the results of the COPC selection for soil invertebrates and plants from surface soil at UXO 2. This table also presents the chemicals that were retained for food chain modeling mammals and birds (discussed below).

Soil Invertebrates

Two explosives (1,3-dinitrobenzene and nitroglycerin) were retained as COPCs for soil invertebrates because a screening level was not available. Two inorganics (lithium and tin) were retained as COPCs for soil invertebrates because a screening level was not available or the maximum concentration exceeded the screening level.

Terrestrial Plants

Two explosives (1,3-dinitrobenzene and nitroglycerin) were retained as COPCs for terrestrial plants because a screening level was not available. Lithium was the only inorganic retained as a COPC for terrestrial plants because the maximum concentration exceeded the screening level.

COPCs for Terrestrial Wildlife

Appendix L Table 5-3 summarizes the results of the conservative food chain modeling for terrestrial receptors, which uses very conservative exposure assumptions. Appendix K presents the calculation worksheets.

Appendix L Table 5-3 lists chemicals selected for food-chain modeling. Table 5-3 summarizes EEQs for the conservative food-chain model. Appendix K contains spreadsheets with EEQ calculations for each receptor. A chemical was retained as a COPC if the calculated NOAEL EEQ was greater than 1.0 for any receptor. Four metals were retained as COPCs for wildlife: copper, lead, mercury, and vanadium.

COPCs for Sediment Invertebrates

Appendix L Table 5-4 presents the results of the COPC selection for sediment invertebrates from sediment at UXO 2. Only lithium and strontium were retained as COPCs for sediment invertebrates because screening levels were not available.

5.24.2 Step 3A Refinement

This section presents the Step 3A refinement for chemicals that were selected as COPCs in the screening step.

Soil Invertebrates and Terrestrial Plants

1,3-Dinitrobenzene and nitroglycerin were retained as COPCs for soil invertebrates and terrestrial plants because screening levels were not available for these explosive constituents. Alternate benchmarks are not available for either of these chemicals for either receptor and are discussed qualitatively. 1,3-Dinitrobenzene and nitroglycerin were both detected infrequently with two detections out of 40 sample locations. Both of these chemicals had low detected concentrations with a maximum of 0.05 mg/kg for 1,3-Dinitrobenzene and 0.17 mg/kg for nitroglycerin. Therefore, 1,3-dinitrobenzene and nitroglycerin are not expected to impact plants or soil invertebrates.

Lithium was retained as a COPC for plants because the maximum detected concentration exceeded the screening level of 2 mg/kg. Screening criteria or alternate benchmarks are not available for soil invertebrates. The screening level for plants (Efroymson et al., 1996) is based on an unspecified phytotoxic effect from the addition of a lithium salt which increases toxicity and likely overestimates exposure as compared to naturally occurring lithium. Additionally, lithium is not expected to be site-related and the detected concentrations are less than the typical nationwide background concentration of 20 mg/kg (Buchman, 2008). Therefore, lithium is not retained as a COPC for soil invertebrates or terrestrial plants.

Tin was retained as a COPC for soil invertebrates. The Dutch Target Value (MHSPE, 2000) and the soil quality level that are ultimately desired for tin is 19 mg/kg. The detected concentrations of tin at UXO 2 in surface soil are much less than this alternate benchmark. Furthermore, tin was only detected in 6 of 40 samples. Therefore, tin is not retained as a COPC for soil invertebrates.

Mammals and Birds

The EEQs from the terrestrial food chain modeling for were greater than 1.0 for copper, lead, mercury, and vanadium using maximum chemical concentrations and conservative exposure assumptions. Therefore, as part of the Step 3a refinement, risks for this pathway were recalculated using average chemical concentrations in surface soil and less conservative exposure assumptions (i.e., average ingestion rates, average body weights).

Appendix L Table 5-5 summarizes the results of the less conservative food chain modeling for terrestrial receptors. Appendix K presents the calculation worksheets. Appendix L Table 5-5 only presents the results of the food chain modeling for the chemicals that were evaluated as part of the Step 3A evaluation. Only mercury had NOAEL EEQs greater than 1 for the robin (8.8) and the shrew (1.1). The average mercury concentration in UXO 2 surface soil (0.04 mg/kg) used for the Step 3A food chain model is significantly less than the representative Indian Head background surface soil concentration of 0.16 mg/kg. This background concentration would produce a risk to these receptors much greater than the risk from surface soil at UXO 2. Therefore, because the LOAEL EEQs were less than 1.0 and the average site concentrations used in the food chain models were less than the background concentration, significant site-related risks to these receptors are not expected. Therefore, mercury is eliminated as a COPC for risks to birds and mammals.

Sediment Invertebrates

Lithium and strontium were initially retained as COPCs because screening levels were not available for sediment. Alternate benchmarks are not available for either of these inorganics. Typical background in sediment for strontium is 49 mg/kg (Buchman, 2008). Lithium (as discussed above) is likely within background. Neither of these inorganics are expected to be present as a result of historical activities at UXO 2, and are not retained as COPCs for sediment invertebrates.

5.24.3 Ecological Risk Screening Summary

No chemicals were retained as COPCs for ecological receptors from detected concentrations of chemicals in surface soil or sediment at UXO 2.

5.25 SI HYDROGEOLOGY

Hydrogeological conditions at Area 8 have been interpreted from data obtained during the VI, during which three monitoring wells were installed at Area 8, and the SI during which three temporary wells were installed at Area 8. The range is characterized by a shallow groundwater table contained within a silty sand with clay aquifer. The water table at Area 8 ranges from the surface, at the wetlands located in the northwestern portion of the range, to 30 feet bgs. A potentiometric groundwater map created in 1995 shows groundwater flowing toward the wetlands to the northwest at a gradient of approximately 0.047. Rising-head and falling-head slug tests performed in 1995 showed the average hydraulic conductivity to be 1.47 feet per day. Using these values and an effective aquifer porosity of 30 percent, groundwater velocity was calculated to be 84 feet per year. A potentiometric groundwater map created from data

collected during the SI (Figure 5-7) confirms groundwater flowing toward the wetlands to the northwest at a gradient of approximately 0.048. Table 5-8 includes the groundwater measurements collected during the SI. Appendix F.14 includes the monitoring well inspection sheets. Appendix F.15 includes the monitoring well schematics for the temporary wells installed during the SI. The temporary wells were installed for the collection of additional groundwater samples. The temporary wells were installed in areas that were hydrogeologically downgradient of potential source MC locations. X02TW001 was installed downgradient of an identified cluster of MPPEH. X02TW002 was installed due west of the pond area and location of subsurface anomalies. X02TW003 was installed between the pond and the location of the most downgradient permanent monitoring well, 25MW01. The temporary wells were abandoned after groundwater collection was completed by tremie grouting to the surface with a cement bentonite grout.

5.26 UPDATED CONCEPTUAL SITE MODEL

A three dimensional depiction of Area 8 is provided as Figure 5-8. . Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses. Only MEC and MC associated with Area 8 are considered in the CSM exposure pathway analysis. A three dimensional depiction of the CSM is presented in Figure 5-8.

5.27 EXPOSURE PATHWAY ANALYSES

Only MC associated with the Area 8 are considered in the CSM exposure pathway analysis. The following general description of the CSM exposure pathway analysis was included in Section 10.2.11 of the UFP SAP: “The potential exists for MEC at the surface of the range. Complete pathways exist for human and ecological receptors for MEC in surface soil. This includes receptors for hand/tread underfoot contact and surface intrusive work that may be conducted at Area 8. These activities include, but are not limited to, excavation, plowing, tilling, construction, and environmental sampling for human receptors. Ecological receptors may come in contact with MEC through burrowing, nesting, or feeding activities that disturb surface soil. Trespassers are anticipated to be exposed via non-intrusive surface soil activities at the range, but it is unlikely they would be exposed to subsurface soil through intrusive activities.” This is supported by the discovery of 1 MEC and 10 MPPEH items during the MEC surface survey.

MEC were not anticipated in subsurface soil at the range because the items were placed on the surface, however 34 subsurface anomalies were logged during the MEC survey and so is included as a potential pathway in Figure 5-9A. As illustrated in the MC Exposure Pathways Analysis (Figure 5-9B), soil and

surface water/sediment impacted by MC represent the primary source medium. Potential receptors include both human and ecological receptors that may disturb, unbury, or remove the source medium from the range. Complete exposure pathways exist for surface soil through ingestion, dermal contact, and inhalation for human and ecological receptors. Runoff, discharges, and/or erosion may transport MC from surface soil to surface water/sediment, so complete pathways also exist for all human and ecological receptors of surface water/sediment. Soil also represents an exposure medium when considering plant/animal uptake for biota (including game such as deer) and human receptors consuming the affected biota (e.g., fishing and hunting). Although hunting is not permitted at Area 8, hunters may wander into the range or consume game that came in contact with MC at the range. Explosives and metals in soil were detected as expected because the water shot locations had explosives between 2 and 5 feet bgs in the 6- to 9-foot-deep water shot locations; however, samples from the VI and the SI do not support this. There is potential for the MC present in the water to infiltrate to subsurface soil or surficial groundwater. Thus, complete exposure pathways exist for MC in subsurface soil for all human and ecological receptors with the exception of trespassers. It is not anticipated that trespassers would come in contact with subsurface soil. Although confining layers are expected to prevent the migration of MC to the lower aquifers used for water supplies, complete pathways exist for MC in shallow groundwater for human receptors.

5.28 CONCLUSIONS

The following conclusions can be made concerning the Area 8:

- The Joint Services EOD Equipment Magnetic Evaluation Facility, Building 2210SN, is located within Area 8. A storage shed, Building 60SN, and a nonmagnetic tank, Building 65SN, are located at the pond. All other structures at the range have been demolished. The wooded area surrounding the pond and existing buildings is unused. According to the installation, there are no planned changes to land use activities at Area 8. The pond at Area 8 is now stocked and used for fishing.

- Inert ordnance items were used at Area 8 for the training of EOD personnel. The pond at Area 8 contained only inert torpedoes and mines for student training in performing diving and reconnaissance operations. Explosives were limited to no more than 0.5 pounds of explosives at shot locations in Area 8. Explosives included TNT block, PETN, military dynamite, blasting caps, detonation cords, and similar devices. A 100-foot-long portion of Chicamuxen Creek in Area 8 was used for training students with a half-buried inert mine on the creek bottom to simulate the conditions of reconnaissance and ordnance problem-solving in muddy waters.

- The UXO Survey was completed on the Pond and Chicamuxen Creek, and 34 anomalies were logged and recorded. One MEC and 10 MPPEH items were discovered on the surface. The MEC and MPPEH items were described as bomb fuze parts, either at the surface or partially buried.

- Six of the ten MPPEH items were located at the southernmost Air Shot area. The remaining four MPPEH items were located randomly throughout the Water Shot locations. The munitions debris was found at the northwest edge of the MRS boundary, approximately 100 feet from Chicamuxen Creek.

- Subsurface soil samples at UXO 2 were analyzed for explosives and inorganics. Nitroglycerin and 21 inorganics were detected in the 40 subsurface soil samples collected at UXO 2. Lithium was the only chemical detected at concentrations exceeding the direct contact human health screening levels. The HIs for residential (HI = 0.1) and industrial (HI = 0.01) exposures to subsurface soil are less than the acceptable level of 1, indicating that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions.

- In the initial Ecological Risk screening, two explosives (1,3-dinitrobenzene and nitroglycerin), and two inorganics (lithium and tin) were retained as COPCs to be furthered evaluated. Four metals were retained as COPCs for wildlife: copper, lead, mercury, and vanadium. After Step 3A refinement, no chemicals were retained as COPCs for ecological receptors from detected concentrations of chemicals in surface soil or sediment at UXO 2.

- The groundwater PAL (there were no background 95 percent UTL values) was exceeded for six unfiltered metals constituents and four filtered metals constituents. Aluminum, Arsenic, Cobalt, Iron, Manganese, and Vanadium exceeded the PAL for unfiltered metals. Aluminum, Arsenic, Cobalt, Iron exceeded the PAL for filtered metals. The upgradient well, 25MW003 exceeded the groundwater PAL for aluminum only. The groundwater constituents exceeded are considered to be noncarcinogenic and were not evaluated for human health criteria.

- The CSM and Exposure Pathway Analyses indicate that potentially complete exposure pathways exist for MEC and complete exposure pathways exist for MC both in human and ecological receptors under both current and hypothetical future land uses. Currently acceptable levels of human and/or ecological risk exist. Groundwater is not currently used at the site.

5.28.1 Data Gaps

There were no data gaps.

5.29 RECOMMENDATIONS FOR NEXT PHASE

It was not necessary to conduct a subsurface geophysical investigation based on the number, the areal extent and the location of shallow subsurface anomalies identified during the detector-aided surface sweeps. The munitions items at the site were known to be inert. Soil, sediment, and groundwater samples were collected in the areas of the MEC and MPPEH discovered items, and the locations of the subsurface anomalies. A human health and ecological risk screening have concluded that no COPCs were retained.

MEC

Proceed to an RI. The RI should include:

- Clearance of surface MEC/MPPEH and non-munition debris.
- Subsurface geophysical investigation.
- Investigation of representative subset of subsurface anomaly discovered during the geophysical investigation.

MC

- No further action is recommended, however MC sampling if subsurface MEC/MPPEH are found.

TABLE 5-1

MUNITION TYPES AND CHEMICALS
AREA 8 - UXO 02
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MUNITIONS TYPES USED/STORED AT THE FACILITY	ASSOCIATED CHEMICAL CONSTITUENTS
TNT	2,4,6-trinitroluene
PETN	pentaerythritol tetranitrate
Military Dynamite	75 percent RDX (Cyclotrimethylenetrinitramine), 15 percent TNT, 5 percent motor oil, 5 percent cornstarch
HMX	Octogen: a powerful and relatively insensitive nitroamine high explosive, chemically related to RDX
Demolition charges: primers, detonators, fuzes, and squibs	Blackpowder (potassium nitrate, sulphur, charcoal or coal, nitrocellulose)
	Metals
	Chloroform
	bis(2 ethylhexyl) phthalate (BEHP)

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 5-2

AREA 8

MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

FACILITY	Stump Neck Annex of Indian Head MD
SITE NUMBER & NAME	112G00810 MMRP Site Investigation

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition (indicate w/ √ as applicable)			Notifications Completed (indicate w/ √ as	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YY		
01/18/2010	1133	Area 8	Area 8-01			X	321444.84	1250565.52	Chemical switch/horn	made of lead, filled with plaster of paris			01/18/2010	X	Area 8-01
01/19/2010	1706	Area 8	Area 8-02			X	321231.42	1250899.52	Chemical switch/horn	made of lead			01/19/2010	X	Area 8-02
01/21/2010	1100	Area 8	Area 8-03		X		321515.12	1250524.60	Torpedo exploder	Rusted			01/21/2010	X	Area 8-03
01/23/2010	1024	Area 8	Area 8-04			X	320745.61	1250692.87	M-904 Fuze, partial	Expended, partial			01/23/2010	X	Area 8-04
01/23/2010	1027	Area 8	Area 8-05			X	320727.48	1250608.61	M-904 Fuze, partial	Expended, partial			01/23/2010	X	Area 8-05
01/23/2010	1029	Area 8	Area 8-06			X	320730.13	1250557.82	Fuze, projectile	Expended, rusty			01/23/2010	X	Area 8-06
01/23/2010	1031	Area 8	Area 8-07			X	320807.50	1250534.34	Base plate, projectile	Rusted			01/23/2010	X	Area 8-07
01/23/2010	1150	Area 8	Area 8-08			X	320821.90	1250569.20	Extender cover, Mine	Rusted component of a sea mine			01/23/2010	X	Area 8-08
01/23/2010	1153	Area 8	Area 8-09			X	320786.95	1250624.97	Rocket motor, partial	Empty, rusted partial motor			01/23/2010	X	Area 8-09
01/23/2010	1155	Area 8	Area 8-10			X	321496.76	1250973.08	Extender cover, Mine	Rusted component of a sea mine			01/23/2010	X	Area 8-10
01/23/2010	1445	Area 8	Area 8-11			X	321000.22	1250461.19	Projectile, 105 WP	Empty, rusted			01/23/2010	X	Area 8-11

TABLE 5-3

MC SAMPLING PROGRAM
AREA 8 - UXO 02
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Sampling Locations	Justification
X02SB001	Check Sampling
X02SB002	Check Sampling
X02SB003	Check Sampling
X02SB004	Muntions Debris Location
X02SB005	MPPEH Location
X02SB006	Check Sampling
X02SB007	MPPEH Location
X02SB008	Check Sampling
X02SB009	Check Sampling
X02SB010	Check Sampling
X02SB011	Check Sampling
X02SB011	Check Sampling
X02SB012	Check Sampling
X02SB013	Check Sampling
X02SB014	Check Sampling
X02SB015	Check Sampling
X02SB016	Check Sampling
X02SB017	Check Sampling
X02SB018	Check Sampling
X02SB019	Check Sampling
X02SB020	Check Sampling
X02SB021	Check Sampling
X02SB022	Check Sampling
X02SB023	Check Sampling
X02SB024	Check Sampling
X02SB025	Check Sampling
X02SB026	Check Sampling
X02SB027	MPPEH Location
X02SB028	Check Sampling
X02SB029	Check Sampling
X02SB030	Check Sampling
X02SB031	Check Sampling
X02SB032	Check Sampling
X02SB033	Check Sampling
X02SB034	MPPEH Location
X02SB035	MPPEH Location
X02SB036	MPPEH Location
X02SB037	MPPEH Location
X02SB038	MPPEH Location
X02SB039	Check Sampling
X02SB040	Check Sampling
X02SD001	Creek Bank Samples
X02SD002	Creek Bank Samples
X02SD003	Creek Bank Samples
X02SD004	Pond Samples
X02SD005	Pond Samples
X02SD006	Pond Samples
X02SD007	Pond Samples

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss00100		x02ss00102		x02ss00200		x02ss00202		x02ss00300		x02ss00302		x02ss00400		x02ss00402		x02ss00500	
	nsample			X02SS0010006		X02SS0010024		X02SS0020006		X02SS0020024		X02SS0030006		X02SS0030024		X02SS0040006		X02SS0040024		X02SS0050006	
	location			X02SB001		X02SB001		X02SB002		X02SB002		X02SB003		X02SB003		X02SB004		X02SB004		X02SB005	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0010006		X02SS0010024		X02SS0020006		X02SS0020024		X02SS0030006		X02SS0030024		X02SS0040006		X02SS0040024		X02SS0050006	
	sample_date			20100203		20100203		20100203		20100203		20100203		20100203		20100203		20100203		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		ORIG	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth				0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	bottom_dep				0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			001		003		005		007		009		011		013		015		017	
cas	x	utl95val	minorpal	c_001		c_003		c_005		c_007		c_009		c_011		c_013		c_015		c_017	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	UL	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	**NITROBENZENE**	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UR	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	5120 [SSL]		6140 [SSL]		4670 [SSL]		8450 [PAL] [ORNL] [MDRES] [SSL]		4580 [SSL]		6850 [SSL]		7220 [SSL]		7110 [SSL]		8910 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.17	L	0.051	J	0.033	UL	0.032	UL	0.033	UL	0.038	J	0.10	J	0.072	L	0.058	J
7440-38-2	ARSENIC	14.9	0.026	1.2 [PAL] [ORNL] [MDRES] [MDSGW]		0.61 [PAL] [ORNL] [MDRES] [MDSGW]		1 [PAL] [ORNL] [MDRES] [MDSGW]		1.1 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	43.8	K	21.2	K	18.5	K	31.2	K	18.7	K	23.7	K	44.1	K	36.5	K	45.8	K
7440-41-7	BERYLLIUM	1.1	16	0.24	J	1.1		0.17	J	0.30	J	0.24	J	0.29	J	0.30	J	0.28	J	0.37	J
7440-43-9	CADMIUM	2.5	0.36	0.11	J	0.081	U	0.081	U	0.082	U	0.082	U	0.082	U	0.082	U	0.083	U	0.081	U
7440-70-2	CALCIUM	2060	NA	175		243		62		70		105		73.9		354		245		136	
7440-47-3	**CHROMIUM**	33.4	**26**	5.5	K	9.8	K	6	K	10	K	10.1	K	12.6	K	10.2	K	10.4	K	11.3	K
7440-48-4	COBALT	22.3	2.3	2.9 [PAL] [ORNL]		2.3		2.2		3.7 [PAL] [ORNL]		3.8 [PAL] [ORNL]		4.8 [PAL] [ORNL]		3.1 [PAL] [ORNL]		2.7 [PAL] [ORNL]		5.7 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	12.6		22.1 [BKG]		2		3		3.1		3.7		12.7		7.4		8.1	
7439-89-6	IRON	38500	5500	3460 [SSL]		5340 [SSL]		5080 [SSL]		8070 [PAL] [ORNL] [MDRES] [SSL]		10000 [PAL] [ORNL] [MDRES] [SSL]		12000 [PAL] [ORNL] [MDRES] [SSL]		6570 [PAL] [ORNL] [MDRES] [SSL]		6020 [PAL] [ORNL] [MDRES] [SSL]		7680 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	18.8 [PAL] [SSL]		14.4 [PAL] [SSL]		7.2		6.1		6.1		5.6		19.7 [PAL] [SSL]		14.1 [PAL] [SSL]		17.9 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	3 [PAL] [OPLNT]		3.9 [PAL] [OPLNT]		3.3 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]		3.6 [PAL] [OPLNT]		4.9 [PAL] [OPLNT]		5.3 [PAL] [OPLNT]		4.9 [PAL] [OPLNT]		7.1 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	295	K	265	K	244	K	424	K	274	K	332	K	546	K	473	K	519	K
7439-96-5	MANGANESE	1390	160	30.5		18.3		28.6		33.9		133		97.7		35.3		32.5		203 [PAL] [ORNL] [MDRES]	
7439-97-6	**MERCURY**	0.16	0.058	0.064 [PAL] [BTAG]		0.023		0.016	J	0.013	J	0.013	J	0.014	J	0.053		0.037		0.081 [PAL] [BTAG]	
7440-02-0	NICKEL	15.4	38	5		4.3		3.8		8.1		4.1		7.9		7.6		8.2		7.2	
7440-09-7	POTASSIUM	1470	NA	535	K	424	K	354	K	590	K	464	K	518	K	582	K	552	K	650	K
7782-49-2	SELENIUM	1.2	0.52	0.41	L	0.15	L	0.11		0.12	L	0.083	J	0.10	L	0.43	L	0.42	L	0.25	L
7440-22-4	SILVER	0.84	4.2	0.083	U	0.081	U	0.081	U	0.082	U	0.082	U	0.082	U	0.082	U	0.083	U	0.081	U
7440-23-5	SODIUM	120	NA	20.2	J	23.4	J	11.2	J	17.7	J	11.5	J	13	J	71.5		52.4		23.6	J
7440-24-6	STRONTIUM	NA	120	4.6	K	3.7	K	2.4	K	3.4	K	2.7	K	2.5	K	5.3	K	4.3	K	3.9	K
7440-31-5	TIN	NA	0.89	0.83	U	0.81	U	0.81	U	0.82	U	0.83	U	0.82	U	0.82	U	0.83	U	0.81	U
7440-62-2	VANADIUM	53.3	7.8	13.7 [PAL] [MDRES] [SSL]	K	17.1 [PAL] [MDRES] [SSL]	K	9.6 [PAL] [MDRES] [SSL]	K	13.9 [PAL] [MDRES] [SSL]	K	12.2 [PAL] [MDRES] [SSL]	K	14.5 [PAL] [MDRES] [SSL]	K	18.1 [PAL] [MDRES] [SSL]	K	15.8 [PAL] [MDRES] [SSL]	K	18.9 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	18		12.7		10.8		18.3		10.5		12.8		19		16.7		23.2	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss00501		x02ss00503		x02ss00506		x02ss00600		x02ss00602		x02ss00700		x02ss00702		x02ss00800		x02ss00802	
	nsample			X02SS0050006-AVG		X02SS0050006-D		X02SS0050024		X02SS0060006		X02SS0060024		X02SS0070006		X02SS0070024		X02SS0080006		X02SS0080024	
	location			X02SB005		X02SB005		X02SB005		X02SB006		X02SB006		X02SB007		X02SB007		X02SB008		X02SB008	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0050006-AVG		FD020410-01		X02SS0050024		X02SS0060006		X02SS0060024		X02SS0070006		X02SS0070024		X02SS0080006		X02SS0080024	
	sample_date			20100204		20100204		20100204		20100203		20100203		20100203		20100203		20100203		20100203	
	sacode			AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate					X02SS0050006															
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		0.00		2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			018		020		023		025		027		029		031		033		035	
cas	x	utl95val	minorpal	c_018		c_020		c_023		c_025		c_027		c_029		c_031		c_033		c_035	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.20	UL	0.2	UL	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	**NITROBENZENE**	NA	0.023	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	9025 [PAL] [ORNL] [MDRES] [SSL]		9140 [PAL] [ORNL] [MDRES] [SSL]		8020 [PAL] [ORNL] [MDRES] [SSL]		4910 [SSL]		8840 [PAL] [ORNL] [MDRES] [SSL]		7690 [SSL]		9060 [PAL] [ORNL] [MDRES] [SSL]		9830 [PAL] [ORNL] [MDRES] [SSL]		11900 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.04225	J	0.053	B	0.032	UL	0.053	J	0.032	UL	0.092	J	0.032	UL	0.054	J	0.033	UL
7440-38-2	ARSENIC	14.9	0.026	1.55 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		0.77 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.4 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.4 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	45	K	44.2	K	54.1	K	20.4	K	35	K	32.2	K	33.6	K	44.7	K	44.4	K
7440-41-7	BERYLLIUM	1.1	16	0.365	J	0.36	J	0.37	J	0.22	J	0.33	J	0.21	J	0.26	J	0.36	J	0.40	J
7440-43-9	CADMIUM	2.5	0.36	0.082	U	0.083	U	0.082	U	0.082	U	0.08	U	0.081	U	0.081	U	0.083	U	0.082	U
7440-70-2	CALCIUM	2060	NA	127.5		119		120		69.3		66		107		100		258		210	
7440-47-3	**CHROMIUM**	33.4	**26**	11.1	K	10.9	K	11.2	K	6.4	K	12.7	K	9.7	K	9.9	K	10.9	K	13.7	K
7440-48-4	COBALT	22.3	2.3	5.35 [PAL] [ORNL]		5 [PAL] [ORNL]		5.3 [PAL] [ORNL]		7 [PAL] [ORNL]		5.6 [PAL] [ORNL]		2.2		2.1		3.2 [PAL] [ORNL]		3 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	7.8		7.5		4.7		4.4		6.4		4.9		4.2		7.8		6	
7439-89-6	IRON	38500	5500	7600 [PAL] [ORNL] [MDRES] [SSL]		7520 [PAL] [ORNL] [MDRES] [SSL]		6720 [PAL] [ORNL] [MDRES] [SSL]		4690 [SSL]		8140 [PAL] [ORNL] [MDRES] [SSL]		7570 [PAL] [ORNL] [MDRES] [SSL]		7630 [PAL] [ORNL] [MDRES] [SSL]		9190 [PAL] [ORNL] [MDRES] [SSL]		11400 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	17 [PAL] [SSL]		16.1 [PAL] [SSL]		9.8		19.5 [PAL] [SSL]		12.9 [PAL] [SSL]		16.1 [PAL] [SSL]		9.3		16.2 [PAL] [SSL]		10.4	
7439-93-2	**LITHIUM**	NA	2	7 [PAL] [OPLNT]		6.9 [PAL] [OPLNT]		9 [PAL] [OPLNT]		6 [PAL] [OPLNT]		13.1 [PAL] [OPLNT]		4.6 [PAL] [OPLNT]		6.3 [PAL] [OPLNT]		6.9 [PAL] [OPLNT]		8.4 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	511	K	503	K	540	K	273	K	567	K	359	K	421	K	552	K	609	K
7439-96-5	MANGANESE	1390	160	181.5 [PAL] [ORNL] [MDRES]		160		157		130		77.8		25.4		22.9		46.3		36.1	
7439-97-6	**MERCURY**	0.16	0.058	0.078 [PAL] [BTAG]		0.075 [PAL] [BTAG]		0.03		0.04		0.018	J	0.034		0.015	J	0.079 [PAL] [BTAG]		0.034	
7440-02-0	NICKEL	15.4	38	7.05		6.9		8		4.4		9.1		5.2		5.8		6.1		7	
7440-09-7	POTASSIUM	1470	NA	647.5	K	645	K	756	K	460	K	1020	K	474	K	632	K	764	K	971	K
7782-49-2	SELENIUM	1.2	0.52	0.25	L	0.25	L	0.16	L	0.25		0.25	L	0.30	L	0.17	L	0.23	L	0.10	L
7440-22-4	SILVER	0.84	4.2	0.082	U	0.083	U	0.082	U	0.082	U	0.08	U	0.081	U	0.081	U	0.083	U	0.082	U
7440-23-5	SODIUM	120	NA	23.35	J	23.1	J	26.5	J	27.5	J	35.8	J	19.3	J	31	J	25.2	J	32.6	J
7440-24-6	STRONTIUM	NA	120	4	K	4.1	K	4.3	K	2.8	K	4.7	K	3.1	K	3.8	K	5.2	K	5.7	K
7440-31-5	TIN	NA	0.89	0.82	U	0.83	U	0.82	U	0.82	U	0.80	U	0.82	U	0.81	U	0.83	U	0.82	U
7440-62-2	VANADIUM	53.3	7.8	18.55 [PAL] [MDRES] [SSL]	K	18.2 [PAL] [MDRES] [SSL]	K	17.4 [PAL] [MDRES] [SSL]	K	14.6 [PAL] [MDRES] [SSL]	K	19.4 [PAL] [MDRES] [SSL]	K	17.1 [PAL] [MDRES] [SSL]	K	17.2 [PAL] [MDRES] [SSL]	K	20.7 [PAL] [MDRES] [SSL]	K	22.9 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	22.6		22		22.7		14.7		22.7		13.9		13.4		36.6		28.2	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss00900		x02ss00902		x02ss01000		x02ss01002		x02ss01100		x02ss01102		x02ss01200		x02ss01202		x02ss01300	
	nsample			X02SS0090006		X02SS0090024		X02SS0100006		X02SS0100024		X02SS0110006		X02SS0110024		X02SS0120006		X02SS0120024		X02SS0130006	
	location			X02SB009		X02SB009		X02SB010		X02SB010		X02SB011		X02SB011		X02SB012		X02SB012		X02SB013	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0090006		X02SS0090024		X02SS0100006		X02SS0100024		X02SS0110006		X02SS0110024		X02SS0120006		X02SS0120024		X02SS0130006	
	sample_date			20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			037		039		041		043		045		047		049		051		053	
cas	x	utl95val	minorpal	c_037		c_039		c_041		c_043		c_045		c_047		c_049		c_051		c_053	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	**NITROBENZENE**	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	13900 [PAL] [ORNL] [MDRES] [SSL]	J	17400 [PAL] [ORNL] [MDRES] [SSL]	J	9290 [PAL] [ORNL] [MDRES] [SSL]	J	15900 [PAL] [ORNL] [MDRES] [SSL]	J	12500 [PAL] [ORNL] [MDRES] [SSL]	J	10900 [PAL] [ORNL] [MDRES] [SSL]	J	9480 [PAL] [ORNL] [MDRES] [SSL]	J	8330 [PAL] [ORNL] [MDRES] [SSL]	J	11500 [PAL] [ORNL] [MDRES] [SSL]	J
7440-36-0	ANTIMONY	NA	0.27	0.054	J	0.034	J	0.041	J	0.075	J	0.036	J	0.032	UL	0.058	J	0.033	UL	0.056	J
7440-38-2	ARSENIC	14.9	0.026	2 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.3 [PAL] [ORNL] [MDRES] [MDSGW]		1.1 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	95.8 [BKG]	K	55.9	K	19.8	K	53.7	K	42	K	18.8	K	24.6	K	28.4	K	17	K
7440-41-7	BERYLLIUM	1.1	16	0.99		0.57	U	0.16	U	0.33	J	0.32	J	0.17	J	0.18	J	0.21	J	0.16	U
7440-43-9	CADMIUM	2.5	0.36	0.081	UL	0.08	UL	0.082	U	0.16	UL	0.082	U	0.081	U	0.081	UL	0.083	UL	0.082	U
7440-70-2	CALCIUM	2060	NA	380	K	189	K	57.6	K	172	K	158	K	67.7	K	84.4	K	98.1	K	113	K
7440-47-3	**CHROMIUM**	33.4	26	18.9	K	10.7	K	4.4	K	**1570 [BKG] [PAL] [SSL]**	K	8.1	K	4.3	K	11.6	K	12	K	7.7	K
7440-48-4	COBALT	22.3	2.3	12.8 [PAL] [ORNL]		6.7 [PAL] [ORNL]		1.3		6.4 [PAL] [ORNL]		2.4 [PAL] [ORNL]		1.1		1.6		1.8		1.3	
7440-50-8	**COPPER**	20.3	28	10.7		4.7		12.9		13.1		3.8		1.5		5		4.2		3.6	
7439-89-6	IRON	38500	5500	15100 [PAL] [ORNL] [MDRES] [SSL]		8310 [PAL] [ORNL] [MDRES] [SSL]		3590 [SSL]		15900 [PAL] [ORNL] [MDRES] [SSL]		4270 [SSL]		2460 [SSL]		7440 [PAL] [ORNL] [MDRES] [SSL]		6570 [PAL] [ORNL] [MDRES] [SSL]		5000 [SSL]	
7439-92-1	**LEAD**	62.5	11	**72.1 [BKG] [PAL] [SSL]**		20.2 [PAL] [SSL]		9.9		9.2		14.3 [PAL] [SSL]		4.9		14.6 [PAL] [SSL]		9.4		14.4 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	2	12.8 [PAL] [OPLNT]		6.4 [PAL] [OPLNT]		2.6 [PAL] [OPLNT]		6.2 [PAL] [OPLNT]		5.8 [PAL] [OPLNT]		3 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]		6.2 [PAL] [OPLNT]		8.1 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	1120	K	635	K	191	K	445	K	490	K	218	K	430	K	439	K	282	K
7439-96-5	MANGANESE	1390	160	567 [PAL] [ORNL] [MDRES] [SSL]	K	258 [PAL] [ORNL] [MDRES] [SSL]	K	27.2	K	138	K	28.3	K	14.2	K	27	K	26.4	K	21.4	K
7439-97-6	**MERCURY**	0.16	0.058	0.028		0.025		0.068 [PAL] [BTAG]		0.028		0.033		0.014	J	0.043		0.028		0.03	
7440-02-0	NICKEL	15.4	38	15.6 [BKG]		9.3		2.8		18.1 [BKG]		5.1		2.4		5.3		5.9		4.3	
7440-09-7	POTASSIUM	1470	NA	1060	K	619	K	242	K	1330	K	639	K	340	K	569	K	639	K	354	K
7782-49-2	SELENIUM	1.2	0.52	0.077	J	0.15	L	0.18	L	0.11	L	0.24	L	0.13	L	0.22	L	0.099	L	0.091	J
7440-22-4	SILVER	0.84	4.2	0.12	J	0.08	U	0.082	U	0.16	U	0.082	U	0.081	U	0.081	U	0.083	U	0.082	U
7440-23-5	SODIUM	120	NA	34.1	K	18.7	J	8.2	U	87.1	K	26.3	K	11.4	J	17.4	J	18.9	J	15.2	J
7440-24-6	STRONTIUM	NA	120	7.2	K	4.4	K	1.9	K	6.4	K	4.7	K	2.5	K	2.9	K	3.1	K	2.3	K
7440-31-5	TIN	NA	0.89	1.1 [PAL] [BTAG]	J	0.80	U	0.82	U	1.6	U	0.82	U	0.81	U	0.81	U	0.83	U	0.82	U
7440-62-2	VANADIUM	53.3	7.8	34.3 [PAL] [MDRES] [SSL]	K	17.6 [PAL] [MDRES] [SSL]	K	9.3 [PAL] [MDRES] [SSL]	K	22.5 [PAL] [MDRES] [SSL]	K	16.6 [PAL] [MDRES] [SSL]	K	8.1 [PAL] [MDRES] [SSL]	K	20.1 [PAL] [MDRES] [SSL]	K	17.5 [PAL] [MDRES] [SSL]	K	13.1 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	**52.7 [BKG] [PAL] [SSL]**		25.1		8.2		12.9	K	13.4		5.9		13.8		14.5		10.2	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss01302		x02ss01400		x02ss01402		x02ss01500		x02ss01502		x02ss01600		x02ss01602		x02ss01700		x02ss01702	
	nsample			X02SS0130024		X02SS0140006		X02SS0140024		X02SS0150006		X02SS0150024		X02SS0160006		X02SS0160024		X02SS0170006		X02SS0170024	
	location			X02SB013		X02SB014		X02SB014		X02SB015		X02SB015		X02SB016		X02SB016		X02SB017		X02SB017	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0130024		X02SS0140006		X02SS0140024		X02SS0150006		X02SS0150024		X02SS0160006		X02SS0160024		X02SS0170006		X02SS0170024	
	sample_date			20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			055		057		059		061		063		065		067		069		071	
cas	x	utl95val	minorpal	c_055		c_057		c_059		c_061		c_063		c_065		c_067		c_069		c_071	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UL	0.2	U	0.19	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UL	0.2	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	UR	0.25	U	0.24	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	UL	0.25	U	0.24	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UL	0.2	U	0.19	U
98-95-3	**NITROBENZENE**	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UL	0.2	U	0.19	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	UR
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	11500 [PAL] [ORNL] [MDRES] [SSL]	J	11100 [PAL] [ORNL] [MDRES] [SSL]	J	12200 [PAL] [ORNL] [MDRES] [SSL]	J	13000 [PAL] [ORNL] [MDRES] [SSL]	J	19300 [PAL] [ORNL] [MDRES] [SSL]	J	12800 [PAL] [ORNL] [MDRES] [SSL]	J	6690 [SSL]		8390 [PAL] [ORNL] [MDRES] [SSL]		7320 [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.046	J	0.036	J	0.032	UL	0.034	J	0.033	UL	0.035	J	0.032	UL	0.051	J	0.033	J
7440-38-2	ARSENIC	14.9	0.026	1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.7 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.5 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	80.4	330	28.3	K	52.3	K	56.1	K	40.4	K	36.7	K	39.8	K	52.9	K	44.7	K	50.4	
7440-41-7	BERYLLIUM	1.1	16	0.23	J	0.54		0.55		0.47	J	0.39	J	0.38	J	0.50		0.47	J	0.47	J
7440-43-9	CADMIUM	2.5	0.36	0.082	U	0.079	UL	0.08	UL	0.081	UL	0.081	UL	0.081	UL	0.082	UL	0.083	UL	0.083	U
7440-70-2	CALCIUM	2060	NA	139	K	213	K	177	K	148	K	106	K	115	K	134	K	148	K	133	
7440-47-3	**CHROMIUM**	33.4	**26**	8.4	K	12.6	K	14.4	K	9.7	K	7.2	K	10.2	K	12.5	K	10.5	K	9.5	
7440-48-4	COBALT	22.3	2.3	1.8		8.7 [PAL] [ORNL]		10.3 [PAL] [ORNL]		7.4 [PAL] [ORNL]		5.7 [PAL] [ORNL]		3.7 [PAL] [ORNL]		4.6 [PAL] [ORNL]		5.2 [PAL] [ORNL]		4.7 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	3.3		4.5		4.5		3.6		2.3		4.3		4.5		4.6		3.7	
7439-89-6	IRON	38500	5500	4700 [SSL]		9540 [PAL] [ORNL] [MDRES] [SSL]		11300 [PAL] [ORNL] [MDRES] [SSL]		7220 [PAL] [ORNL] [MDRES] [SSL]		5600 [PAL] [ORNL] [MDRES] [SSL]		7750 [PAL] [ORNL] [MDRES] [SSL]		9130 [PAL] [ORNL] [MDRES] [SSL]		8560 [PAL] [ORNL] [MDRES] [SSL]		7530 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	13.1 [PAL] [SSL]		14.3 [PAL] [SSL]		11.7 [PAL] [SSL]		13.5 [PAL] [SSL]		5.5		12.5 [PAL] [SSL]		9.1		29.9 [PAL] [SSL]		12.1 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	4 [PAL] [OPLNT]		6.9 [PAL] [OPLNT]		8.1 [PAL] [OPLNT]		4.7 [PAL] [OPLNT]		4.1 [PAL] [OPLNT]		4.9 [PAL] [OPLNT]		6 [PAL] [OPLNT]		5.6 [PAL] [OPLNT]		5.5 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	365	K	680	K	782	K	477	K	433	K	455	K	532	K	527	K	509	
7439-96-5	MANGANESE	1390	160	24.9	K	245 [PAL] [ORNL] [MDRES] [SSL]	K	197 [PAL] [ORNL] [MDRES]	K	243 [PAL] [ORNL] [MDRES] [SSL]	K	159	K	130	K	180 [PAL] [MDRES]		175 [PAL] [MDRES]		187 [PAL] [ORNL] [MDRES]	
7439-97-6	**MERCURY**	0.16	0.058	0.021		0.03		0.02		0.022		0.017	J	0.029		0.011	J	0.025	L	0.016	J
7440-02-0	NICKEL	15.4	38	5.3		8.3		9.4		7.5		6.2		6		7.6		6.9		8	
7440-09-7	POTASSIUM	1470	NA	480	K	724	K	855	K	472	K	417	K	522	K	690	K	558	K	590	K
7782-49-2	SELENIUM	1.2	0.52	0.18	L	0.097	J	0.099	L	0.14	L	0.14	L	0.17	L	0.14	J	0.17	J	0.22	L
7440-22-4	SILVER	0.84	4.2	0.082	U	0.079	U	0.08	U	0.081	U	0.081	U	0.081	U	0.082	U	0.083	U	0.083	U
7440-23-5	SODIUM	120	NA	19.6	J	22.4	J	25	K	14.2	J	10.7	J	15	J	17.9	J	12.6	J	19.8	J
7440-24-6	STRONTIUM	NA	120	3.4	K	5	K	5.1	K	3.7	K	3	K	3.5	K	4.1	K	3.8	K	4	
7440-31-5	TIN	NA	0.89	0.82	U	0.80	U	0.80	U	0.81	U	0.81	U	0.82	U	0.82	U	0.83	U	0.83	U
7440-62-2	VANADIUM	53.3	7.8	13.4 [PAL] [MDRES] [SSL]	K	20.8 [PAL] [MDRES] [SSL]	K	22.5 [PAL] [MDRES] [SSL]	K	16.7 [PAL] [MDRES] [SSL]	K	11.7 [PAL] [MDRES] [SSL]	K	16.5 [PAL] [MDRES] [SSL]	K	17.4 [PAL] [MDRES] [SSL]	K	17.9 [PAL] [MDRES] [SSL]	K	15.3 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	12		22.3		23.1		19.2		13.4		16.1		19.2		20.7		18.9	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss01800		x02ss01802		x02ss01900		x02ss01902		x02ss02000		x02ss02002		x02ss02100		x02ss02102		x02ss02200	
	nsample			X02SS0180006		X02SS0180024		X02SS0190006		X02SS0190024		X02SS0200006		X02SS0200024		X02SS0210006		X02SS0210024		X02SS0220006	
	location			X02SB018		X02SB018		X02SB019		X02SB019		X02SB020		X02SB020		X02SB021		X02SB021		X02SB022	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0180006		X02SS0180024		X02SS0190006		X02SS0190024		X02SS0200006		X02SS0200024		X02SS0210006		X02SS0210024		X02SS0220006	
	sample_date			20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			073		075		077		079		081		083		085		087		089	
cas	x	utl95val	minorpal	c_073		c_075		c_077		c_079		c_081		c_083		c_085		c_087		c_089	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.19	UJ	0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	UJ	0.2	U	0.2	UJ	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.24	U	0.25	U	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.19	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	**NITROBENZENE**	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	4050 [SSL]		6940 [SSL]		6910 [SSL]		5950 [SSL]		3830 [SSL]		3110 [SSL]		7830 [PAL] [ORNL] [MDRES] [SSL]		14700 [PAL] [ORNL] [MDRES] [SSL]		7030 [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.033	UL	0.032	UL	0.055	J	0.033	UL	0.032	UL	0.032	UL	0.099	J	0.052	J	0.054	J
7440-38-2	ARSENIC	14.9	0.026	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.3 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.1 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.80 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.53 [PAL] [ORNL] [MDRES] [MDSGW]	J	4.5 [PAL] [ORNL] [MDRES] [MDSGW]	J	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	80.4	330	29.7	K	33.2	K	39	K	41.4	K	18.7	K	14.4	K	27.8	K	39.9	K	32.4	K
7440-41-7	BERYLLIUM	1.1	16	0.23	J	0.28	J	0.30	J	0.33	J	0.17	U	0.16	U	0.26	J	0.37	J	0.31	J
7440-43-9	CADMIUM	2.5	0.36	0.083	UL	0.083	UL	0.083	U	0.081	U	0.083	U	0.082	U	0.082	UL	0.081	UL	0.082	UL
7440-70-2	CALCIUM	2060	NA	20300 [BKG]	K	6930 [BKG]	K	120	K	202	K	102	K	67.3	K	157	K	143	K	158	K
7440-47-3	**CHROMIUM**	33.4	**26**	7.2	K	9.7	K	9.3	K	9.9	K	4.7	K	4	K	11.7	K	14.9	K	11.9	K
7440-48-4	COBALT	22.3	2.3	3 [PAL] [ORNL]		2.8 [PAL] [ORNL]		3 [PAL] [ORNL]		3.1 [PAL] [ORNL]		1.1		0.79		2.2		3.4 [PAL] [ORNL]		3.2 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	3.2		3.3		**65.5 [BKG] [PAL] [SSL]**		**77.4 [BKG] [PAL] [SSL]**		10.7		7.9		4.9		5.7		6.4	
7439-89-6	IRON	38500	5500	5520 [PAL] [ORNL] [MDRES] [SSL]		7220 [PAL] [ORNL] [MDRES] [SSL]		4000 [SSL]		4550 [SSL]		3530 [SSL]		2380 [SSL]		9290 [PAL] [ORNL] [MDRES] [SSL]		12000 [PAL] [ORNL] [MDRES] [SSL]		9430 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	13.7 [PAL] [SSL]		8		21.5 [PAL] [SSL]		22.8 [PAL] [SSL]		11		7.3		15.7 [PAL] [SSL]		15.3 [PAL] [SSL]		18 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	3.7 [PAL] [OPLNT]		5.4 [PAL] [OPLNT]		5.9 [PAL] [OPLNT]		6.2 [PAL] [OPLNT]		3.2 [PAL] [OPLNT]		2.7 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]		8.9 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	**11700 [BKG] [PAL] [BTAG]**	K	4320 [BKG]	K	414	K	451	K	262	K	190	K	530	K	776	K	564	K
7439-96-5	MANGANESE	1390	160	204 [PAL] [ORNL] [MDRES]		106		26.7		28.3		24.7		20.2		51.1		51.8		70.7	
7439-97-6	**MERCURY**	0.16	0.058	0.023	L	0.012	J	**0.32 [BKG] [PAL] [BTAG]**	L	**0.18 [BKG] [PAL] [BTAG]**	L	0.042	L	0.023	L	0.023	L	0.018	J	0.027	L
7440-02-0	NICKEL	15.4	38	4.7		5.8		6		8.1		3.5		2.7		6.6		8		6.8	
7440-09-7	POTASSIUM	1470	NA	496	K	645	K	544	K	607	K	393	K	296	K	704	K	1010	K	699	K
7782-49-2	SELENIUM	1.2	0.52	0.11	J	0.034	J	0.20	J	0.12	J	0.11	J	0.13	J	0.032	UJ	0.032	UJ	0.056	J
7440-22-4	SILVER	0.84	4.2	0.083	U	0.083	U	0.083	U	0.081	U	0.083	U	0.082	U	0.082	U	0.081	U	0.082	U
7440-23-5	SODIUM	120	NA	25.4		19.4	J	16.5	J	15.2	J	9.6	J	8.2	U	18	J	24.5		12.8	J
7440-24-6	STRONTIUM	NA	120	10	K	6.4	K	3.7	K	4.3	K	2.5	K	2.1	K	3.9	K	4.7	K	4.5	K
7440-31-5	TIN	NA	0.89	0.83	U	0.83	U	0.83	U	0.82	U	0.83	U	0.82	U	0.82	U	0.82	U	0.82	U
7440-62-2	VANADIUM	53.3	7.8	12.2 [PAL] [MDRES] [SSL]	K	14.7 [PAL] [MDRES] [SSL]	K	15.3 [PAL] [MDRES] [SSL]	K	16.8 [PAL] [MDRES] [SSL]	K	11.5 [PAL] [MDRES] [SSL]	K	8.5 [PAL] [MDRES] [SSL]	K	20.5 [PAL] [MDRES] [SSL]	K	24.4 [PAL] [MDRES] [SSL]	K	21.2 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	16.1		15.3		17.5		18.4		10.2		7.4		16.8		20.9		19.2	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss02202		x02ss02300		x02ss02302		x02ss02400		x02ss02402		x02ss02403		x02ss02405		x02ss02500		x02ss02502	
	nsample			X02SS0220024		X02SS0230006		X02SS0230024		X02SS0240006		X02SS0240024		X02SS0240024-AVG		X02SS0240024-D		X02SS0250006		X02SS0250024	
	location			X02SB022		X02SB023		X02SB023		X02SB024		X02SB024		X02SB024		X02SB024		X02SB025		X02SB025	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0220024		X02SS0230006		X02SS0230024		X02SS0240006		X02SS0240024		X02SS0240024-AVG		FD020410-02		X02SS0250006		X02SS0250024	
	sample_date			20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate															X02SS0240024					
	top_depth				0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	bottom_dep				2.00		0.50		2.00		0.50		2.00		2.00		2.00		0.50		2.00
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			091		093		095		097		099		100		102		105		107	
cas	x	utl95val	minorpal	c_091		c_093		c_095		c_097		c_099		c_100		c_102		c_105		c_107	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.195	UL	0.19	U	0.2	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.195	UL	0.19	U	0.2	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.245	U	0.24	U	0.24	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.245	UL	0.24	U	0.24	UL	0.25	UL
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.195	UL	0.19	U	0.2	UL	0.2	UL
98-95-3	**NITROBENZENE**	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.15	U	1.1	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.15	U	1.1	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.195	UL	0.19	U	0.2	UL	0.2	UL
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	7860 [PAL] [ORNL] [MDRES] [SSL]		8980 [PAL] [ORNL] [MDRES] [SSL]		8270 [PAL] [ORNL] [MDRES] [SSL]		3740 [SSL]		4190 [SSL]		4170 [SSL]		4150 [SSL]		2570 [SSL]		2270 [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.036	J	0.045	J	0.032	UL	0.039	J	0.032	UL	0.0325	UL	0.033	UL	0.032	UL	0.058	J
7440-38-2	ARSENIC	14.9	0.026	1.5 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.5 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.25 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	80.4	330	52.8	K	47.1	K	53.5	K	27.8	K	32.9	K	32.45	K	32		14.3	K	12.2	K
7440-41-7	BERYLLIUM	1.1	16	0.42	J	0.40	J	0.49	J	0.28	J	0.36	J	0.35	J	0.34	J	0.16	U	0.17	U
7440-43-9	CADMIUM	2.5	0.36	0.082	UL	0.081	UL	0.082	UL	0.081	UL	0.082	UL	0.0825	UL	0.083	U	0.082	UL	0.083	UL
7440-70-2	CALCIUM	2060	NA	132	K	448	K	220	K	100	K	81.3	K	81.15	K	81		88.6	K	90.9	K
7440-47-3	**CHROMIUM**	33.4	**26**	14.1	K	11.5	K	12.2	K	7.3	K	7.3	K	7.2	K	7.1		7.7	K	6.7	K
7440-48-4	COBALT	22.3	2.3	4.1 [PAL] [ORNL]		5.9 [PAL] [ORNL]		7.6 [PAL] [ORNL]		3.1 [PAL] [ORNL]		4.7 [PAL] [ORNL]		4.5 [PAL] [ORNL]		4.3 [PAL] [ORNL]		1.9		1.5	
7440-50-8	**COPPER**	20.3	28	6		5		4.1		12.8		3.6		4.05		4.5		10.8		11.6	
7439-89-6	IRON	38500	5500	12200 [PAL] [ORNL] [MDRES] [SSL]		9230 [PAL] [ORNL] [MDRES] [SSL]		9100 [PAL] [ORNL] [MDRES] [SSL]		6840 [PAL] [ORNL] [MDRES] [SSL]		7090 [PAL] [ORNL] [MDRES] [SSL]		6880 [PAL] [ORNL] [MDRES] [SSL]		6670 [PAL] [ORNL] [MDRES] [SSL]		7430 [PAL] [ORNL] [MDRES] [SSL]		6430 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	11.5 [PAL] [SSL]		13.1 [PAL] [SSL]		10.2		10.9		5.7		5.8		5.9		7.3		10.6	
7439-93-2	**LITHIUM**	NA	2	8.5 [PAL] [OPLNT]		6.6 [PAL] [OPLNT]		7.1 [PAL] [OPLNT]		3.5 [PAL] [OPLNT]		3.6 [PAL] [OPLNT]		3.65 [PAL] [OPLNT]		3.7 [PAL] [OPLNT]		1.7		1.4	
7439-95-4	**MAGNESIUM**	1620	4400	816	K	633	K	695	K	271	K	283	K	286.5	K	290		194	K	180	K
7439-96-5	MANGANESE	1390	160	76.8		198 [PAL] [ORNL] [MDRES]		150		49.3		62.6		58.15		53.7		50.5		46.6	
7439-97-6	**MERCURY**	0.16	0.058	0.01	J	0.027	L	0.013	J	0.022	L	0.011	J	0.013	J	0.015	J	0.017	J	0.038	L
7440-02-0	NICKEL	15.4	38	8.5		7.5		9.4		5.2		6.3		6.4		6.5		4.5		3.2	
7440-09-7	POTASSIUM	1470	NA	812	K	757	K	770	K	326	K	300	K	304.5	K	309	K	327	K	320	K
7782-49-2	SELENIUM	1.2	0.52	0.032	UJ	0.05	J	0.032	UJ	0.19	J	0.079	J	0.0605	J	0.042	J	0.13	J	0.12	J
7440-22-4	SILVER	0.84	4.2	0.082	U	0.081	U	0.082	U	0.081	U	0.082	U	0.0825	U	0.083	U	0.082	U	0.083	U
7440-23-5	SODIUM	120	NA	12.3	J	13.7	J	16.3	J	8.1	U	8.2	U	6.3	J	8.5	J	8.2	U	8.3	U
7440-24-6	STRONTIUM	NA	120	4.6	K	5.6	K	4.8	K	2.8	K	2.6	K	2.75	K	2.9		3.3	K	2.8	K
7440-31-5	TIN	NA	0.89	0.83	U	0.81	U	0.82	U	0.81	U	0.82	U	0.825	U	0.83	U	0.82	U	0.83	U
7440-62-2	VANADIUM	53.3	7.8	23.2 [PAL] [MDRES] [SSL]	K	20.4 [PAL] [MDRES] [SSL]	K	18.6 [PAL] [MDRES] [SSL]	K	13.7 [PAL] [MDRES] [SSL]	K	10.5 [PAL] [MDRES] [SSL]	K	10.4 [PAL] [MDRES] [SSL]	K	10.3 [PAL] [MDRES] [SSL]		12.7 [PAL] [MDRES] [SSL]	K	16.7 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	24.4		21.2		21.5		13.3		14.1		13.85		13.6		9.2		9.6	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss02600		x02ss02601		x02ss02603		x02ss02606		x02ss02700		x02ss02702		x02ss02800		x02ss02802		x02ss02900	
	nsample			X02SS0260006		X02SS0260006-AVG		X02SS0260006-D		X02SS0260024		X02SS0270006		X02SS0270024		X02SS0280006		X02SS0280024		X02SS0290006	
	location			X02SB026		X02SB026		X02SB026		X02SB026		X02SB027		X02SB027		X02SB028		X02SB028		X02SB029	
	project_no			00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052	
	sample_coc			X02SS0260006		X02SS0260006-AVG		FD031010-03		X02SS0260024		X02SS0270006		X02SS0270024		X02SS0280006		X02SS0280024		X02SS0290006	
	sample_date			20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310	
	sacode			ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate							X02SS0260006													
	top_depth				0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	bottom_dep				0.50		0.50		0.50		2.00		0.50		2.00		0.50		2.00		0.50
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			109		110		112		115		117		119		121		123		125	
cas	x	utl95val	minorpal	c_109		c_110		c_112		c_115		c_117		c_119		c_121		c_123		c_125	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.05	J	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.20	UL	0.2	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	UL
98-95-3	**NITROBENZENE**	NA	0.023	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UL	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	12700 [PAL] [ORNL] [MDRES] [SSL]		11145 [PAL] [ORNL] [MDRES] [SSL]		9590 [PAL] [ORNL] [MDRES] [SSL]		13900 [PAL] [ORNL] [MDRES] [SSL]		9230 [PAL] [ORNL] [MDRES] [SSL]		9950 [PAL] [ORNL] [MDRES] [SSL]		8530 [PAL] [ORNL] [MDRES] [SSL]		8040 [PAL] [ORNL] [MDRES] [SSL]		6410 [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.098	UJ	0.056	J	0.056	J	0.099	UJ	0.1	UJ	0.099	UJ	0.1	UJ	0.099	UJ	0.098	UJ
7440-38-2	ARSENIC	14.9	0.026	2.4 [PAL] [ORNL] [MDRES] [MDSGW]		2.25 [PAL] [ORNL] [MDRES] [MDSGW]		2.1 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		2.1 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	71.6		59.8		48		55.1		51.9		49.9		43		38.2		21	
7440-41-7	BERYLLIUM	1.1	16	0.66		0.56	J	0.46	J	0.53		0.5		0.47	J	0.34	J	0.37	J	0.21	J
7440-43-9	CADMIUM	2.5	0.36	0.082000	U	0.0815	U	0.081000	U	0.082000	U	0.081000	U	0.080000	U	0.082000	U	0.083000	U	0.082000	U
7440-70-2	CALCIUM	2060	NA	564	J	386	J	208	J	298	J	495	J	234	J	381	J	209	J	96.2	J
7440-47-3	**CHROMIUM**	33.4	26	12.7		12.4		12.1		12.5		8.9		8.8		9		7.8		8.7	
7440-48-4	COBALT	22.3	2.3	6.1 [PAL] [ORNL]		5.4 [PAL] [ORNL]		4.7 [PAL] [ORNL]		5.7 [PAL] [ORNL]		4.8 [PAL] [ORNL]		4.8 [PAL] [ORNL]		5.4 [PAL] [ORNL]		4.8 [PAL] [ORNL]		1.8	
7440-50-8	**COPPER**	20.3	28	17.5	J	11.25	J	5	J	7.1	J	4.1	J	3.8	J	3.4	J	3.2	J	7.4	J
7439-89-6	IRON	38500	5500	9520 [PAL] [ORNL] [MDRES] [SSL]		9910 [PAL] [ORNL] [MDRES] [SSL]		10300 [PAL] [ORNL] [MDRES] [SSL]		8410 [PAL] [ORNL] [MDRES] [SSL]		6950 [PAL] [ORNL] [MDRES] [SSL]		6510 [PAL] [ORNL] [MDRES] [SSL]		6960 [PAL] [ORNL] [MDRES] [SSL]		5680 [PAL] [ORNL] [MDRES] [SSL]		6910 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	19.2 [PAL] [SSL]		24.35 [PAL] [SSL]		29.5 [PAL] [SSL]		10.8		15.1 [PAL] [SSL]		9		13.7 [PAL] [SSL]		8.1		24.2 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	2	7.2 [PAL] [OPLNT]		6.85 [PAL] [OPLNT]		6.5 [PAL] [OPLNT]		7.3 [PAL] [OPLNT]		4.7 [PAL] [OPLNT]		4.9 [PAL] [OPLNT]		4.1 [PAL] [OPLNT]		3.7 [PAL] [OPLNT]		3.7 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	783		678		573		694		474		496		408		376		339	
7439-96-5	MANGANESE	1390	160	354 [PAL] [ORNL] [MDRES] [SSL]	J	276.5 [PAL] [ORNL] [MDRES] [SSL]	J	199 [PAL] [ORNL] [MDRES]	J	190 [PAL] [ORNL] [MDRES]	J	403 [PAL] [ORNL] [MDRES] [SSL]	J	203 [PAL] [ORNL] [MDRES]	J	225 [PAL] [ORNL] [MDRES] [SSL]	J	154	J	34.8	J
7439-97-6	**MERCURY**	0.16	0.058	0.059 [PAL] [BTAG]	K	0.0475	J	0.036	J	0.026	J	0.051	K	0.023	K	0.034	K	0.022	K	0.039	K
7440-02-0	NICKEL	15.4	38	11		9.75		8.5		9.1		7.2		6.8		6		6.5		5.1	
7440-09-7	POTASSIUM	1470	NA	677	K	672.5	K	668	K	614	K	439	K	458	K	366	K	337	K	397	K
7782-49-2	SELENIUM	1.2	0.52	0.032000	U	0.032	U	0.032000	U	0.033000	U	0.044	J	0.033000	U	0.033000	U	0.033000	U	0.032000	U
7440-22-4	SILVER	0.84	4.2	0.082000	U	0.0815	U	0.081000	U	0.082000	U	0.081000	U	0.080000	U	0.082000	U	0.083000	U	0.082000	U
7440-23-5	SODIUM	120	NA	24.9		19.95	J	15	J	19.8	J	10.5	J	11.5	J	12.2	J	10.2	J	16.2	J
7440-24-6	STRONTIUM	NA	120	6.7	K	5.7	K	4.7	K	5.1	K	5.4	K	4.6	K	5	K	3.6	K	2.5	K
7440-31-5	TIN	NA	0.89	0.820000	U	0.815	U	0.810000	U	0.83 [PAL] [BTAG]	J	0.83	J	0.810000	U	0.88	J	0.830000	U	0.91 [PAL] [BTAG]	J
7440-62-2	VANADIUM	53.3	7.8	21.8 [PAL] [MDRES] [SSL]		21.75 [PAL] [MDRES] [SSL]		21.7 [PAL] [MDRES] [SSL]		18 [PAL] [MDRES] [SSL]		15.9 [PAL] [MDRES] [SSL]		13.6 [PAL] [MDRES] [SSL]		15.2 [PAL] [MDRES] [SSL]		11.7 [PAL] [MDRES] [SSL]		15.8 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	32.8		27.65		22.5		23.2		21.1		17.1		16.1		15		11.8	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss02902		x02ss03000		x02ss03002		x02ss03100		x02ss03102		x02ss03200		x02ss03202		x02ss03300		x02ss03301	
	nsample			X02SS0290024		X02SS0300006		X02SS0300024		X02SS0310006		X02SS0310024		X02SS0320006		X02SS0320024		X02SS0330006		X02SS0330006-AVG	
	location			X02SB029		X02SB030		X02SB030		X02SB031		X02SB031		X02SB032		X02SB032		X02SB033		X02SB033	
	project_no			00810_2010052		00810_2010052		00810_2010052		00810_2010042		00810_2010042		00810_2010052		00810_2010052		00810_2010052		00810_2010052	
	sample_coc			X02SS0290024		X02SS0300006		X02SS0300024		X02SS0310006		X02SS0310024		X02SS0320006		X02SS0320024		X02SS0330006		X02SS0330006-AVG	
	sample_date			20100310		20100310		20100310		20100204		20100204		20100310		20100310		20100310		20100310	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			127		129		131		133		135		137		139		141		142	
cas	x	utl95val	minorpal	c_127		c_129		c_131		c_133		c_135		c_137		c_139		c_141		c_142	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	UL	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	U	0.2	UL	0.2	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.20	UL
98-95-3	**NITROBENZENE**	NA	0.023	0.2	U	0.2	U	**0.05 [PAL] [MDSGW]**	J	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	6110 [SSL]		9440 [PAL] [ORNL] [MDRES] [SSL]		6820 [SSL]		5890 [SSL]		11800 [PAL] [ORNL] [MDRES] [SSL]		13100 [PAL] [ORNL] [MDRES] [SSL]		13100 [PAL] [ORNL] [MDRES] [SSL]		11500 [PAL] [ORNL] [MDRES] [SSL]		11150 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.062	J	0.058	J	0.045	J	0.05	J	0.065	UL	0.1	UJ	0.099	UJ	0.1	UJ	0.099	UJ
7440-38-2	ARSENIC	14.9	0.026	2 [PAL] [ORNL] [MDRES] [MDSGW]		2.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.2 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]	J	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		2.3 [PAL] [ORNL] [MDRES] [MDSGW]		2.3 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	23.1		39.9		31.1		37.2	K	56.5	K	66.9		82.1 [BKG]		42.7		56.15	
7440-41-7	BERYLLIUM	1.1	16	0.23	J	0.25	J	0.22	J	0.38	J	0.89	J	0.52		0.7		0.42	J	0.525	J
7440-43-9	CADMIUM	2.5	0.36	0.083000	U	0.082000	U	0.082000	U	0.082	UL	0.16	UL	0.083000	U	0.083000	U	0.081000	U	0.082	U
7440-70-2	CALCIUM	2060	NA	83.5	J	2240 [BKG]	J	1230	J	130	K	113	K	1180	J	1060	J	186	J	378	J
7440-47-3	**CHROMIUM**	33.4	**26**	8.4		20.6		13.5		9.7	K	18.6	K	14.7		13.1		11.2		11.65	
7440-48-4	COBALT	22.3	2.3	1.9		3.9 [PAL] [ORNL]		2.5 [PAL] [ORNL]		3.3 [PAL] [ORNL]		6.7 [PAL] [ORNL]		5.3 [PAL] [ORNL]		6.4 [PAL] [ORNL]		4.7 [PAL] [ORNL]		5.35 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	5.8	J	12.3	J	9.3	J	6.4		12.1		8.4	J	7	J	4.6	J	8.5	J
7439-89-6	IRON	38500	5500	6640 [PAL] [ORNL] [MDRES] [SSL]		9690 [PAL] [ORNL] [MDRES] [SSL]		7810 [PAL] [ORNL] [MDRES] [SSL]		9890 [PAL] [ORNL] [MDRES] [SSL]		24100 [PAL] [ORNL] [MDRES] [SSL]		11800 [PAL] [ORNL] [MDRES] [SSL]		9680 [PAL] [ORNL] [MDRES] [SSL]		9120 [PAL] [ORNL] [MDRES] [SSL]		9290 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	20.2 [PAL] [SSL]		41 [PAL] [SSL]		38.5 [PAL] [SSL]		16.3 [PAL] [SSL]		13 [PAL] [SSL]		30.2 [PAL] [SSL]		18.2 [PAL] [SSL]		26.2 [PAL] [SSL]		22.25 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	2	3.8 [PAL] [OPLNT]		5 [PAL] [OPLNT]		4.5 [PAL] [OPLNT]		5.5 [PAL] [OPLNT]		13.8 [PAL] [OPLNT]		7.5 [PAL] [OPLNT]		7.3 [PAL] [OPLNT]		5.8 [PAL] [OPLNT]		6.45 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	354		2260 [BKG]		1150		426	K	848	K	791		939		500		643.5	
7439-96-5	MANGANESE	1390	160	30.7	J	371 [PAL] [ORNL] [MDRES] [SSL]	J	215 [PAL] [ORNL] [MDRES]	J	45.7		65.2		605 [PAL] [ORNL] [MDRES] [SSL]	J	538 [PAL] [ORNL] [MDRES] [SSL]	J	180 [PAL] [MDRES]	J	270 [PAL] [ORNL] [MDRES] [SSL]	J
7439-97-6	**MERCURY**	0.16	0.058	0.03	L	0.051	K	0.034	L	0.027	L	0.015	J	0.058	K	0.037	K	0.037	K	0.0485	J
7440-02-0	NICKEL	15.4	38	6		21.8 [BKG]		12.5		7.1		16.5 [BKG]		10.3		11.3		7.7		9.25	
7440-09-7	POTASSIUM	1470	NA	393	K	527	K	422	K	720	K	1510 [BKG]	K	765	K	689	K	570	K	617	K
7782-49-2	SELENIUM	1.2	0.52	0.041	J	0.062	J	0.032000	U	0.14	J	0.065	UJ	0.033000	U	0.033000	U	0.033000	U	0.0325	U
7440-22-4	SILVER	0.84	4.2	0.083000	U	0.082000	U	0.082000	U	0.082	U	0.16	U	0.083000	U	0.083000	U	0.081000	U	0.082	U
7440-23-5	SODIUM	120	NA	12.9	J	90.8		36.2		13.4	J	26.5	J	31.1		21.2	J	13.9	J	18.3	J
7440-24-6	STRONTIUM	NA	120	2.4	K	10.4	K	6.2	K	4.3	K	8.4	K	11.3	K	7.6	K	4.3	K	5.45	K
7440-31-5	TIN	NA	0.89	0.830000	U	1.3 [PAL] [ETAG]	J	1.2 [PAL] [ETAG]	J	0.83	U	1.6	U	0.89	J	0.830000	U	0.820000	U	0.825	U
7440-62-2	VANADIUM	53.3	7.8	14.4 [PAL] [MDRES] [SSL]		21.1 [PAL] [MDRES] [SSL]		15.5 [PAL] [MDRES] [SSL]		19.7 [PAL] [MDRES] [SSL]	K	29.1 [PAL] [MDRES] [SSL]	K	26.5 [PAL] [MDRES] [SSL]		21.2 [PAL] [MDRES] [SSL]		18.9 [PAL] [MDRES] [SSL]		20.05 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	12.2		22.2		16.9		20.6		44.9 [BKG]		30.1		28.8		20.4		26.5	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss03303		x02ss03306		x02ss03400		x02ss03402		x02ss03500		x02ss03502		x02ss03600		x02ss03602		x02ss03700	
	nsample			X02SS0330006-D		X02SS0330024		X02SS0340006		X02SS0340024		X02SS0350006		X02SS0350024		X02SS0360006		X02SS0360024		X02SS0370006	
	location			X02SB033		X02SB033		X02SB034		X02SB034		X02SB035		X02SB035		X02SB036		X02SB036		X02SB037	
	project_no			00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052	
	sample_coc			FD031010-02		X02SS0330024		X02SS0340006		X02SS0340024		X02SS0350006		X02SS0350024		X02SS0360006		X02SS0360024		X02SS0370006	
	sample_date			20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310	
	sacode			DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate			X02SS0330006																	
	top_depth				0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	bottom_dep				0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			144		147		149		151		153		155		157		159		161	
cas	x	utl95val	minorpal	c_144		c_147		c_149		c_151		c_153		c_155		c_157		c_159		c_161	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	**NITROBENZENE**	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	10800 [PAL] [ORNL] [MDRES] [SSL]		11600 [PAL] [ORNL] [MDRES] [SSL]		11000 [PAL] [ORNL] [MDRES] [SSL]		10900 [PAL] [ORNL] [MDRES] [SSL]		11300 [PAL] [ORNL] [MDRES] [SSL]		16800 [PAL] [ORNL] [MDRES] [SSL]		7120 [SSL]		11700 [PAL] [ORNL] [MDRES] [SSL]		6490 [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.098	UJ	0.099	UJ	0.098	UJ	0.099	UJ	0.097	UJ	0.099	UJ	0.1	UJ	0.1	UJ	0.046	J
7440-38-2	ARSENIC	14.9	0.026	2.3 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.1 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.1 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.1 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.6 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	69.6		59.1		48.6		79.3		38.1		59.4		31.7		40.2		34.6	
7440-41-7	BERYLLIUM	1.1	16	0.63		0.53		0.5		0.6		0.4	J	0.64		0.51		0.6		0.41	J
7440-43-9	CADMIUM	2.5	0.36	0.083000	U	0.082000	U	0.082000	U	0.083000	U	0.082000	U	0.083000	U	0.083000	U	0.082000	U	0.082000	U
7440-70-2	CALCIUM	2060	NA	570	J	161	J	300	J	190	J	299	J	191	J	90.6	J	93	J	138	J
7440-47-3	**CHROMIUM**	33.4	**26**	12.1		11.9		11.1		11.7		16.9		9		12.3		10.1			
7440-48-4	COBALT	22.3	2.3	6 [PAL] [ORNL]		5.3 [PAL] [ORNL]		6.3 [PAL] [ORNL]		6.9 [PAL] [ORNL]		4.7 [PAL] [ORNL]		7.8 [PAL] [ORNL]		6.6 [PAL] [ORNL]		6.5 [PAL] [ORNL]		9.9 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	12.4	J	4.8	J	4.8	J	4.7	J	5.8	J	6.8	J	5.3	J	5.6	J	**28.8 [BKG] [PAL] [SSL]**	J
7439-89-6	IRON	38500	5500	9460 [PAL] [ORNL] [MDRES] [SSL]		9690 [PAL] [ORNL] [MDRES] [SSL]		9900 [PAL] [ORNL] [MDRES] [SSL]		9160 [PAL] [ORNL] [MDRES] [SSL]		9430 [PAL] [ORNL] [MDRES] [SSL]		14100 [PAL] [ORNL] [MDRES] [SSL]		9920 [PAL] [ORNL] [MDRES] [SSL]		12600 [PAL] [ORNL] [MDRES] [SSL]		11600 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	18.3 [PAL] [SSL]		18.4 [PAL] [SSL]		11.5 [PAL] [SSL]		8.9		15.4 [PAL] [SSL]		13.7 [PAL] [SSL]		13 [PAL] [SSL]		7.8		15.2 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	7.1 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]		5.7 [PAL] [OPLNT]		5.8 [PAL] [OPLNT]		6.5 [PAL] [OPLNT]		11 [PAL] [OPLNT]		8.8 [PAL] [OPLNT]		5.9 [PAL] [OPLNT]		3.2 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	787		537		511		520		639		1110		389		577		313	
7439-96-5	MANGANESE	1390	160	360 [PAL] [ORNL] [MDRES] [SSL]	J	186 [PAL] [ORNL] [MDRES]	J	393 [PAL] [ORNL] [MDRES] [SSL]	J	495 [PAL] [ORNL] [MDRES] [SSL]	J	91.1	J	110	J	90.3	J	89.1	J	271 [PAL] [ORNL] [MDRES] [SSL]	J
7439-97-6	**MERCURY**	0.16	0.058	0.06 [PAL] [BTAG]	J	0.027	K	0.03	K	0.021	K	0.042	K	0.03	K	0.027	K	0.021	K	0.045	K
7440-02-0	NICKEL	15.4	38	10.8		9.1		8.2		10.9		8.8		14.5		6.8		10.7		7.1	
7440-09-7	POTASSIUM	1470	NA	664	K	552	K	556	K	525	K	544	K	960	K	344	K	493	K	387	K
7782-49-2	SELENIUM	1.2	0.52	0.032000	U	0.033000	U	0.038	J	0.033000	U	0.049	J	0.033000	U	0.07	J	0.033000	U	0.18	
7440-22-4	SILVER	0.84	4.2	0.083000	U	0.082000	U	0.082000	U	0.083000	U	0.082000	U	0.083000	U	0.083000	U	0.082000	U	0.082000	U
7440-23-5	SODIUM	120	NA	22.7	J	15.8	J	14.3	J	14.2	J	12.2	J	21.1	J	9.1	J	8.9	J	11.2	J
7440-24-6	STRONTIUM	NA	120	6.6	K	4.6	K	4.7	K	4.2	K	4.7	K	5.4	K	3.4	K	3.5	K	4	K
7440-31-5	TIN	NA	0.89	0.830000	U	0.820000	U	0.820000	U	0.830000	U	0.830000	U	0.830000	U	0.830000	U	0.820000	U	0.820000	U
7440-62-2	VANADIUM	53.3	7.8	21.2 [PAL] [MDRES] [SSL]		18 [PAL] [MDRES] [SSL]		17.9 [PAL] [MDRES] [SSL]		16.3 [PAL] [MDRES] [SSL]		20.6 [PAL] [MDRES] [SSL]		27.9 [PAL] [MDRES] [SSL]		16.1 [PAL] [MDRES] [SSL]		18.9 [PAL] [MDRES] [SSL]		21.6 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	32.6		21.9		23.4		23.4		22.3		33.6		19.4		22.4		16.8	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss03702		x02ss03800		x02ss03802		x02ss03900		x02ss03902		x02ss04000		x02ss04002	
	nsample			X02SS0370024		X02SS0380006		X02SS0380024		X02SS0390006		X02SS0390024		X02SS0400006		X02SS0400024	
	location			X02SB037		X02SB038		X02SB038		X02SB039		X02SB039		X02SB040		X02SB040	
	project_no			00810_2010052		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0370024		X02SS0380006		X02SS0380024		X02SS0390006		X02SS0390024		X02SS0400006		X02SS0400024	
	sample_date			20100310		20100204		20100204		20100204		20100204		20100204		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate																
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS	
	z			163		165		167		169		171		173		175	
cas	x	utl95val	minorpal	c_163		c_165		c_167		c_169		c_171		c_173		c_175	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.028	J	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.19	UJ	0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	**NITROBENZENE**	NA	0.023	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	0.086	J	1.1	U	1.2	U	1.2	U	1.2	U	0.17	J	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	19700	7700	8070 [PAL] [ORNL] [MDRES] [SSL]		5610 [SSL]		4770 [SSL]		6260 [SSL]		5730 [SSL]		12200 [PAL] [ORNL] [MDRES] [SSL]		12500 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.042	J	0.032	UL	0.032	UL	0.037	J	0.032	UL	0.038	J	0.035	J
7440-38-2	ARSENIC	14.9	0.026	3.3 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	80.4	330	54		29.9		27.5		18.1		19.4		28.1		36.3	
7440-41-7	BERYLLIUM	1.1	16	0.55		0.42	J	0.50	J	0.17	J	0.18	J	0.21	J	0.30	J
7440-43-9	CADMIUM	2.5	0.36	0.083000	U	0.083	U	0.083	U	0.082	U	0.081	U	0.083	U	0.082	U
7440-70-2	CALCIUM	2060	NA	87.6	J	89.2		68.7		60.2		36.7		128		75.3	
7440-47-3	**CHROMIUM**	33.4	**26**	11.2		8.9		8.3		9.1		8.6		14.6		15.4	
7440-48-4	COBALT	22.3	2.3	10.5 [PAL] [ORNL]		4.7 [PAL] [ORNL]		5.2 [PAL] [ORNL]		1.2		1.4		2		2.6 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	16.4	J	4.3		3.1		18.6		2.8		7.2		6.4	
7439-89-6	IRON	38500	5500	13600 [PAL] [ORNL] [MDRES] [SSL]		8590 [PAL] [ORNL] [MDRES] [SSL]		8210 [PAL] [ORNL] [MDRES] [SSL]		8960 [PAL] [ORNL] [MDRES] [SSL]		8330 [PAL] [ORNL] [MDRES] [SSL]		12900 [PAL] [ORNL] [MDRES] [SSL]		13100 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	8.4		12.4 [PAL] [SSL]		6.2		10.2		6.5		17 [PAL] [SSL]		10	
7439-93-2	**LITHIUM**	NA	2	3.6 [PAL] [OPLNT]		3.9 [PAL] [OPLNT]		2.6 [PAL] [OPLNT]		4.5 [PAL] [OPLNT]		3.8 [PAL] [OPLNT]		8.2 [PAL] [OPLNT]		8.9 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	332		346		256		336		301		516		559	
7439-96-5	MANGANESE	1390	160	358 [PAL] [ORNL] [MDRES] [SSL]	J	88		70		34.3		33		47.7		88.1	
7439-97-6	**MERCURY**	0.16	0.058	0.028	K	0.025		0.014	J	0.022		0.0098	J	0.029		0.02	J
7440-02-0	NICKEL	15.4	38	9.3		6.2		6.3		4.2		4.4		6.3		6.9	
7440-09-7	POTASSIUM	1470	NA	528	K	463	K	277	K	631	K	479	K	1070	K	1060	K
7782-49-2	SELENIUM	1.2	0.52	0.14		0.15	L	0.14	L	0.063	J	0.042	J	0.038	J	0.033	UL
7440-22-4	SILVER	0.84	4.2	0.083000	U	0.083	U	0.083	U	0.082	U	0.081	U	0.083	U	0.082	U
7440-23-5	SODIUM	120	NA	12.2	J	13.3	J	8.3	U	13.5	J	10.2	J	25.8		23.7	J
7440-24-6	STRONTIUM	NA	120	3.9	K	2.9		2.1		2.8		2.4		4.2		3.9	
7440-31-5	TIN	NA	0.89	0.830000	U	0.83	U	0.83	U	0.82	U	0.81	U	0.83	U	0.83	U
7440-62-2	VANADIUM	53.3	7.8	18.8 [PAL] [MDRES] [SSL]		15.8 [PAL] [MDRES] [SSL]		10.7 [PAL] [MDRES] [SSL]		16.3 [PAL] [MDRES] [SSL]		13 [PAL] [MDRES] [SSL]		25.2 [PAL] [MDRES] [SSL]		23.5 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	18.9		19.5		16.3		15.2		11.5		20.9		19.8	
	Miscellaneous Parameters																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA									52.7					
TTNUS288	PERCENT MOISTURE (%)	NA	NA									13.7					
TTNUS002	PH (S.U.)	8.8	NA									4.59	J				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA									3800					
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA									**86.3 [BKG]**					

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column2		column4		column6		column8		column10		column12		column14	
	nsample			X02SB0010204		X02SB0010406		X02SB0020204		X02SB0020406		X02SB0030204		X02SB0030406		X02SB0040204	
	location			X02SB001		X02SB001		X02SB002		X02SB002		X02SB003		X02SB003		X02SB004	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X02SB0010204		X02SB0010406		X02SB0020204		X02SB0020406		X02SB0030204		X02SB0030406		X02SB0040204	
	gis_date			20100312		20100312		20100312		20100312		20100312		20100312		20100315	
	qc_type			NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate																
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB	
	z			001		003		005		007		009		011		013	
cas	x	utl95conv	minorpal	c_001		c_003		c_005		c_007		c_009		c_011		c_013	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	35400	7700	10800 [PAL] [ORNL] [MDRES]		13100 [PAL] [ORNL] [MDRES]		11500 [PAL] [ORNL] [MDRES]		12000 [PAL] [ORNL] [MDRES]		13200 [PAL] [ORNL] [MDRES]		30100 [PAL] [ORNL] [MDRES]		11600 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.17	UL	0.032	UL	0.033	UL	0.032	UL	0.16	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	0.96 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.1 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	134	330	50.2		43.8		36.5		50.4		83.8		99.8		44.3	J
7440-41-7	BERYLLIUM	3.3	16	0.36	J	0.49	J	0.36	J	0.58	J	0.78	J	0.98	L	0.31	J
7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.17	U	0.17	U	0.17	U	0.083	U	0.16	U	0.081	U
7440-70-2	CALCIUM	2590	NA	57.2		67.2		56.7		241		165		121		92	L
7440-47-3	CHROMIUM	60.1	26	12.8	K	21.4	K	14.7	K	18.3	K	19.9	K	30.1 [PAL] [SSL]	K	10.7	L
7440-48-4	COBALT	133	2.3	4 [PAL] [ORNL]		3.5 [PAL] [ORNL]		3.4 [PAL] [ORNL]		7.1 [PAL] [ORNL]		8 [PAL] [ORNL]		6.9 [PAL] [ORNL]		3.2 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	4.7		9		3.9		8.5		9.4		18.2		3.6	L
7439-89-6	IRON	83100	5500	9060 [PAL] [ORNL] [MDRES]		26700 [PAL] [ORNL] [MDRES]		14100 [PAL] [ORNL] [MDRES]		20800 [PAL] [ORNL] [MDRES]		11700 [PAL] [ORNL] [MDRES]		18200 [PAL] [ORNL] [MDRES]		8410 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	8.2		9		6.9		9.3		7.6		15.6 [PAL] [SSL]		6.8	
7439-93-2	**LITHIUM**	NA	2	**9 [PAL] [OPLNT]**		**12.4 [PAL] [OPLNT]**		**13.7 [PAL] [OPLNT]**		**14.1 [PAL] [OPLNT]**		**19.4 [PAL] [ORNL] [OPLNT]**		**36.8 [PAL] [ORNL] [OPLNT]**		**6.8 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	590		825		780		1110		1290		1970		517	
7439-96-5	MANGANESE	4130	160	23.1	J	39.9	J	44.7	J	60.4	J	151	J	43.6	J	115	
7439-97-6	MERCURY	0.18	0.058	0.009	J	0.014	UL	0.0068	UL	0.014	UL	0.01	J	0.034	UL	0.019	J
7440-02-0	NICKEL	18.2	38	7.4		8.2		6.4		11.4		14		21.4 [BKG]		4.8	L
7440-09-7	POTASSIUM	2610	NA	828		1400		1030		1990		2150		3300 [BKG]		698	
7782-49-2	SELENIUM	13.3	0.52	0.032	UL	0.044	J	0.032	UL	0.033	UL	0.032	UL	0.16	UL	0.088	J
7440-22-4	SILVER	11.4	4.2	0.16	UL	0.17	UL	0.17	UL	0.17	UL	0.083	UL	0.16	UL	0.081	UL
7440-23-5	SODIUM	258	NA	16.5	J	28.9	J	21.3	J	43.5	J	71.5		104		15.4	J
7440-24-6	STRONTIUM	NA	120	3.9	K	5.1	K	4.5	K	8.8	K	10.5	K	15.2	K	3.6	
7440-31-5	**TIN**	NA	0.89	1.6	U	1.7	U	1.7	U	1.7	U	0.83	U	1.6	U	0.82	U
7440-62-2	VANADIUM	194	7.8	21.2 [PAL] [MDRES] [SSL]	K	34.7 [PAL] [MDRES] [SSL]	K	23.5 [PAL] [MDRES] [SSL]	K	27.9 [PAL] [MDRES] [SSL]	K	30.9 [PAL] [MDRES] [SSL]	K	45.8 [PAL] [ORNL] [MDRES] [SSL]	K	17.8 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	24.3		22.5		21.5		28.9		38.4		62.8 [PAL] [SSL]		16.2	L
	Miscellaneous																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA														
TTNUS288	PERCENT MOISTURE (%)	NA	NA														
TTNUS002	PH (s.u)	NA	NA														
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA														
TTNUS046	TOTAL SOLIDS(%)	NA	NA														

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

column16		parameter			column18	column20	column22	column24	column26	column28
X02SB0040406		nsample			X02SB0050204	X02SB0050406	X02SB0060204	X02SB0060406	X02SB0070204	X02SB0070406
X02SB004		location			X02SB005	X02SB005	X02SB006	X02SB006	X02SB007	X02SB007
00810_2010061		project_no			00810_2010061	00810_2010061	00810_2010061	00810_2010061	00810_2010061	00810_2010061
X02SB0040406		sample_coc			X02SB0050204	X02SB0050406	X02SB0060204	X02SB0060406	X02SB0070204	X02SB0070406
20100315		gis_date			20100312	20100312	20100312	20100312	20100312	20100312
NM		qc_type			NM	NM	NM	NM	NM	NM
NORMAL		sacode			NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SO		matrix			SO	SO	SO	SO	SO	SO
		duplicate								
4.00		top_depth			2.00	4.00	2.00	4.00	2.00	4.00
6.00		bottom_dep			4.00	6.00	4.00	6.00	4.00	6.00
FT		depth_unit			FT	FT	FT	FT	FT	FT
SB		submatrix			SB	SB	SB	SB	SB	SB
015		z			017	019	021	023	025	027
c_015	cas	x	utl95conv	minorpal	c_017	c_019	c_021	c_023	c_025	c_027
		Explosives (mg/kg)								
0.2 U	99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	99-65-0	1,3-DINITROBENZENE	0.75	610	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	88-72-2	2-NITROTOLUENE	NA	2.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	618-87-1	3,5-DINITROANILINE	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	99-08-1	3-NITROTOLUENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	99-99-0	4-NITROTOLUENE	NA	30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 UL	2691-41-0	HMX	NA	380	0.2 UL	0.2 UL	0.2 UL	0.2 UL	0.2 UL	0.2 UL
0.2 U	98-95-3	NITROBENZENE	NA	0.023	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1.2 U	55-63-0	NITROGLYCERIN	NA	0.61	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1.2 U	78-11-5	PETN	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
0.2 U	121-82-4	RDX	NA	5.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	479-45-8	TETRYL	NA	24	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
		Inorganics (mg/kg)								
15600 [PAL] [ORNL] [MDRES]	7429-90-5	ALUMINUM	35400	7700	10600 [PAL] [ORNL] [MDRES]	10700 [PAL] [ORNL] [MDRES]	19500 [PAL] [ORNL] [MDRES]	11300 [PAL] [ORNL] [MDRES]	29800 [PAL] [ORNL] [MDRES]	7940 [PAL] [ORNL] [MDRES]
0.032 UL	7440-36-0	ANTIMONY	1.8	0.27	0.033 UL	0.033 UL	0.033 UL	0.032 UL	0.16 UL	0.065 UL
2 [PAL] [ORNL] [MDRES] [MDSGW] L	7440-38-2	ARSENIC	18.9	0.026	1.1 [PAL] [ORNL] [MDRES] [MDSGW] L	4.4 [PAL] [ORNL] [MDRES] [MDSGW] L	1.5 [PAL] [ORNL] [MDRES] [MDSGW] L	2.7 [PAL] [ORNL] [MDRES] [MDSGW] L	1.4 [PAL] [ORNL] [MDRES] [MDSGW] L	1.6 [PAL] [ORNL] [MDRES] [MDSGW] L
38.3 J	7440-39-3	BARIUM	134	330	52.8	37.7	83.4	51.7	58.9	29.1
0.22 J	7440-41-7	BERYLLIUM	3.3	16	0.46 J	0.82 J	0.95 J	0.63 L	0.7 L	0.77 J
0.082 U	7440-43-9	CADMIUM	0.61	0.36	0.17 U	0.16 U	0.17 U	0.083 U	0.082 U	0.16 U
65.4 L	7440-70-2	CALCIUM	2590	NA	59.4	36.4	86.3	116	72.9	66.6
14.1 L	7440-47-3	CHROMIUM	60.1	26	12 K	16.4 K	28.4 [PAL] [SSL] K	17 K	34.2 [PAL] [SSL] K	37.4 [PAL] [SSL] K
3.4 [PAL] [ORNL]	7440-48-4	COBALT	133	2.3	6.8 [PAL] [ORNL]	11.7 [PAL] [ORNL]	8.2 [PAL] [ORNL]	8 [PAL] [ORNL]	3.4 [PAL] [ORNL]	2.6 [PAL] [ORNL]
3.5 L	7440-50-8	COPPER	48.6	28	3.1	7.3	14.9	7	6.7	2.7
10900 [PAL] [ORNL] [MDRES]	7439-89-6	IRON	83100	5500	9940 [PAL] [ORNL] [MDRES]	25300 [PAL] [ORNL] [MDRES]	17500 [PAL] [ORNL] [MDRES]	10600 [PAL] [ORNL] [MDRES]	11500 [PAL] [ORNL] [MDRES]	26000 [PAL] [ORNL] [MDRES]
9.1	7439-92-1	LEAD	40.5	11	8	11.2 [PAL] [SSL]	14.2 [PAL] [SSL]	8	9.9	5.4
9.3 [PAL] [OPLNT]	**7439-93-2**	**LITHIUM**	NA	2	**10.5 [PAL] [OPLNT]**	**9.9 [PAL] [OPLNT]**	**29.4 [PAL] [ORNL] [OPLNT]**	**10.9 [PAL] [OPLNT]**	**18.7 [PAL] [ORNL] [OPLNT]**	**6.8 [PAL] [OPLNT]**
669	7439-95-4	MAGNESIUM	2640	4400	543	623	1810	1150	2110	1990
55.1	7439-96-5	MANGANESE	4130	160	149 J	216 [PAL] [ORNL] [MDRES] J	32.5 J	17.5 J	26.2 J	16.1 J
0.014 J	7439-97-6	MERCURY	0.18	0.058	0.0083 J	0.015 J	0.0069 UL	0.0069 UL	0.035 UL	0.014 UL
6.3 L	7440-02-0	NICKEL	18.2	38	6.3	8.1	15.2	10.8	10.2	4.8 K
1110	7440-09-7	POTASSIUM	2610	NA	619	1170	2790 [BKG]	1440	3070 [BKG]	3460 [BKG]
0.032 UL	7782-49-2	SELENIUM	13.3	0.52	0.033 UL	0.27 L	0.033 UL	0.032 UL	0.16 UL	0.16 UL
0.082 UL	7440-22-4	SILVER	11.4	4.2	0.17 UL	0.16 UL	0.17 UL	0.083 UL	0.082 UL	0.16 UL
30.5	7440-23-5	SODIUM	258	NA	16.6 U	23.9 J	132	144	212	113
5.1	7440-24-6	STRONTIUM	NA	120	2.8 K	3.8 K	12.2 K	7 K	8.1 K	4.1 K
0.82 U	**7440-31-5**	**TIN**	NA	0.89	1.7 U	1.6 U	1.7 U	0.83 U	**0.97 [PAL] [BTAG]** J	1.7 U
24.8 [PAL] [MDRES] [SSL] J	7440-62-2	VANADIUM	194	7.8	21.5 [PAL] [MDRES] [SSL] K	32.7 [PAL] [MDRES] [SSL] K	42.9 [PAL] [ORNL] [MDRES] [SSL] K	23.7 [PAL] [MDRES] [SSL] K	41.8 [PAL] [ORNL] [MDRES] [SSL] K	28.5 [PAL] [MDRES] [SSL] K
20.8 J	**7440-66-6**	**ZINC**	70.4	46	21.9	22.5	45.4	36	22.1	18.2 K
		Miscellaneous								
	TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA						
	TTNUS288	PERCENT MOISTURE (%)	NA	NA						
	TTNUS002	PH (s.u)	NA	NA						
	TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA						
	TTNUS046	TOTAL SOLIDS(%)	NA	NA						

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

column30		column32			parameter			column34		column36		column38		column40		column42	
X02SB0080204		X02SB0080406			nsample			X02SB0090204		X02SB0090406		X02SB0100204		X02SB0100406		X02SB0120204	
X02SB008		X02SB008			location			X02SB009		X02SB009		X02SB010		X02SB010		X02SB012	
00810_2010061		00810_2010061			project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
X02SB0080204		X02SB0080406			sample_coc			X02SB0090204		X02SB0090406		X02SB0100204		X02SB0100406		X02SB0120204	
20100312		20100312			gis_date			20100312		20100312		20100312		20100312		20100312	
NM		NM			qc_type			NM		NM		NM		NM		NM	
NORMAL		NORMAL			sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
SO		SO			matrix			SO		SO		SO		SO		SO	
					duplicate												
2.00		4.00			top_depth			2.00		4.00		2.00		4.00		2.00	
4.00		6.00			bottom_dep			4.00		6.00		4.00		6.00		4.00	
FT		FT			depth_unit			FT		FT		FT		FT		FT	
SB		SB			submatrix			SB		SB		SB		SB		SB	
029		031			z			033		035		037		039		041	
c_029		c_031		cas	x	utl95conv	minorpal	c_033		c_035		c_037		c_039		c_041	
Explosives (mg/kg)																	
0.2	U	0.2	U	99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.2	U	0.2	U	99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.25	U	0.24	U	118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
0.2	U	0.2	U	121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.2	U	0.2	U	606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.2	U	0.2	U	35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.2	U	0.2	U	88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.25	U	0.24	U	618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
0.2	U	0.2	U	99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.2	U	0.2	U	19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.2	U	0.2	U	99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.2	UL	0.2	UL	2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
0.2	U	0.2	U	98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1.2	U	1.2	U	55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
1.2	U	1.2	U	78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
0.2	U	0.2	U	121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
0.2	U	0.2	U	479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	UR	0.2	U	0.2	U
Inorganics (mg/kg)																	
30900 [PAL] [ORNL] [MDRES]		27000 [PAL] [ORNL] [MDRES]		7429-90-5	ALUMINUM	35400	7700	11500 [PAL] [ORNL] [MDRES]		15500 [PAL] [ORNL] [MDRES]		16800 [PAL] [ORNL] [MDRES]		11800 [PAL] [ORNL] [MDRES]		11900 [PAL] [ORNL] [MDRES]	
0.16	UL	0.17	UL	7440-36-0	ANTIMONY	1.8	0.27	0.065	U	0.064	U	0.032	UL	0.033	UL	0.033	UL
6.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	6.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	7440-38-2	ARSENIC	18.9	0.026	3.1 [PAL] [ORNL] [MDRES] [MDSGW]		3.7 [PAL] [ORNL] [MDRES] [MDSGW]		3.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	5.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.7 [PAL] [ORNL] [MDRES] [MDSGW]	L
74.6		73.8		7440-39-3	BARIUM	134	330	74.8		30		51.9		29.7		23.8	
0.62	J	0.87	J	7440-41-7	BERYLLIUM	3.3	16	0.64	J	0.4	J	0.8	J	0.46	J	0.18	J
0.16	U	0.33	U	7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.16	U	0.16	U	0.16	U	0.081	U
164		115		7440-70-2	CALCIUM	2590	NA	115		26.2		44.7		31.2		22.6	
33.8 [PAL] [SSL]	K	32.9 [PAL] [SSL]	K	7440-47-3	CHROMIUM	60.1	26	20		19.1		20.7	K	20.2	K	12.5	K
3.8 [PAL] [ORNL]		3.5 [PAL] [ORNL]		7440-48-4	COBALT	133	2.3	8 [PAL] [ORNL]		3.8 [PAL] [ORNL]		5.2 [PAL] [ORNL]		2.8 [PAL] [ORNL]		0.88	
13.5		11.3		7440-50-8	COPPER	48.6	28	7.4		8.8		11.9		7.6		2.4	
33000 [PAL] [ORNL] [MDRES]		42600 [PAL] [ORNL] [MDRES]		7439-89-6	IRON	83100	5500	17200 [PAL] [ORNL] [MDRES]		20500 [PAL] [ORNL] [MDRES]		22000 [PAL] [ORNL] [MDRES]		18800 [PAL] [ORNL] [MDRES]		5250	
14.2 [PAL] [SSL]		14 [PAL] [SSL]		7439-92-1	LEAD	40.5	11	8.5		8.2		10.6		7.5		5.9	
22 [PAL] [ORNL] [OPLNT]		**20.9 [PAL] [ORNL] [OPLNT]**		**7439-93-2**	**LITHIUM**	NA	2	**12 [PAL] [OPLNT]**		**12.4 [PAL] [OPLNT]**		**17.1 [PAL] [ORNL] [OPLNT]**		**10.1 [PAL] [OPLNT]**		**7.5 [PAL] [OPLNT]**	
1630		1470		7439-95-4	MAGNESIUM	2640	4400	1180		799		1060		610		381	
46.5	J	24.2	J	7439-96-5	MANGANESE	4130	160	148		50.7		38.1	J	28.2	J	10.9	J
0.035	UL	0.038	J	7439-97-6	MERCURY	0.18	0.058	0.027	J	0.018	J	0.024	J	0.012	J	0.0088	J
12.7		13.3		7440-02-0	NICKEL	18.2	38	11.5		8.8		13.3		7.3		3.3	
2940 [BKG]		3080 [BKG]		7440-09-7	POTASSIUM	2610	NA	1380		1210		1350		1140		932	
0.16	UL	0.17	UL	7782-49-2	SELENIUM	13.3	0.52	0.16	U	0.16	U	0.096	J	0.096	J	0.16	UL
0.16	UL	0.33	UL	7440-22-4	SILVER	11.4	4.2	0.16	U	0.16	U	0.16	UL	0.16	UL	0.081	UL
85.4		76.4	J	7440-23-5	SODIUM	258	NA	33.6	J	28.2	J	26	J	25.7	J	23.3	J
10.8	K	10.1	K	7440-24-6	STRONTIUM	NA	120	5.9		3.8		5.8	K	3.5	K	3.7	K
1.6	U	3.3	U	**7440-31-5**	**TIN**	NA	0.89	1.6	U	1.6	U	1.6	U	1.6	U	0.82	U
59 [PAL] [ORNL] [MDRES] [SSL]	K	61.3 [PAL] [ORNL] [MDRES] [SSL]	K	7440-62-2	VANADIUM	194	7.8	32.2 [PAL] [MDRES] [SSL]		31.2 [PAL] [MDRES] [SSL]		35.7 [PAL] [MDRES] [SSL]	K	30 [PAL] [MDRES] [SSL]	K	27.1 [PAL] [MDRES] [SSL]	K
32.7		29.8		**7440-66-6**	**ZINC**	70.4	46	29.4		24.1		37.9		20.1		8.7	
Miscellaneous																	
				TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA										
				TTNUS288	PERCENT MOISTURE (%)	NA	NA										
				TTNUS002	PH (s.u)	NA	NA										
				TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA										
				TTNUS046	TOTAL SOLIDS(%)	NA	NA										

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

column44		column46	
X02SB0120406		X02SB0140204	
X02SB012		X02SB014	
00810_2010061		00810_2010061	
X02SB0120406		X02SB0140204	
20100312		20100315	
NM		NM	
NORMAL		NORMAL	
SO		SO	
4.00		2.00	
6.00		4.00	
FT		FT	
SB		SB	
043		045	
c_043		c_045	
0.2	U	0.19	U
0.2	U	0.19	U
0.25	U	0.24	U
0.2	U	0.19	U
0.2	U	0.19	U
0.2	U	0.19	U
0.2	U	0.19	U
0.25	U	0.24	U
0.2	U	0.19	U
0.2	U	0.19	U
0.2	U	0.19	U
0.2	UL	0.19	UL
0.2	U	0.19	U
1.2	U	1.2	U
1.2	U	1.2	U
0.2	U	0.19	U
0.2	U	0.19	U
13000 [PAL] [ORNL] [MDRES]		19900 [PAL] [ORNL] [MDRES]	
0.032	UL	0.033	UL
0.72 [PAL] [ORNL] [MDRES] [MDSGW]	J	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	L
33.1		24.5	J
0.29	J	0.33	UJ
0.081	U	0.16	U
51.3		39.4	L
14.4	K	14.2	L
1.8		11.1 [PAL] [ORNL]	
4.4		6.6	L
6550 [PAL] [ORNL] [MDRES]		18600 [PAL] [ORNL] [MDRES]	
8.2		7.7	
10.1 [PAL] [OPLNT]		**9.5 [PAL] [OPLNT]**	
585		688	
15.9	J	357 [PAL] [ORNL] [MDRES] [SSL]	
0.014	J	0.027	J
5.4		6.1	L
1190		851	
0.16	UL	0.092	J
0.081	UL	0.16	UL
31.8		16.5	U
4.8	K	2.8	K
0.82	U	1.7	U
20 [PAL] [MDRES] [SSL]	K	24.8 [PAL] [MDRES] [SSL]	J
13.6		18.3	L

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column48		column50		column52		column54		column56		column58		column60	
	nsample			X02SB0140406		X02SB0160204		X02SB0160406		X02SB0180204		X02SB0180406		X02SB0240204		X02SB0240406	
	location			X02SB014		X02SB016		X02SB016		X02SB018		X02SB018		X02SB024		X02SB024	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X02SB0140406		X02SB0160204		X02SB0160406		X02SB0180204		X02SB0180406		X02SB0240204		X02SB0240406	
	gis_date			20100315		20100312		20100312		20100312		20100312		20100315		20100315	
	qc_type			NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate																
	top_depth			4.00		2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			6.00		4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB	
	z			047		049		051		053		055		057		059	
cas	x	utl95conv	minorpal	c_047		c_049		c_051		c_053		c_055		c_057		c_059	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.1	U	0.11	J	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																
7429-90-5	ALUMINUM	35400	7700	19700 [PAL] [ORNL] [MDRES]		14500 [PAL] [ORNL] [MDRES]		34700 [PAL] [ORNL] [MDRES]		15700 [PAL] [ORNL] [MDRES]		16300 [PAL] [ORNL] [MDRES]		13700 [PAL] [ORNL] [MDRES]		9390 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.033	UL	0.047	J	0.033	UL	0.033	UL	0.033	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	2.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	6.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	134	330	20.7	J	41.5	J	63.1	J	26.7	J	33.6	J	74.1	J	42.6	J
7440-41-7	BERYLLIUM	3.3	16	0.23	J	0.33	J	0.75	J	0.32	UL	0.45	J	0.63	J	0.43	J
7440-43-9	CADMIUM	0.61	0.36	0.081	U	0.082	U	0.33	U	0.16	U	0.16	U	0.16	U	0.083	U
7440-70-2	CALCIUM	2590	NA	47.6	L	85.9	L	154	L	77.8	L	40.6	L	55.9	L	46.9	L
7440-47-3	CHROMIUM	60.1	26	12.3	L	17.2	L	32.3 [PAL] [SSL]	L	18.3	L	18.8	L	17.8	L	13.3	L
7440-48-4	COBALT	133	2.3	2.1		2.6 [PAL] [ORNL]		4.2 [PAL] [ORNL]		2.2		2.4 [PAL] [ORNL]		9.2 [PAL] [ORNL]		7.1 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	5.5	L	7.1	L	15.6	L	9.1	L	8.7	L	10.8	L	7	L
7439-89-6	IRON	83100	5500	11400 [PAL] [ORNL] [MDRES]		11500 [PAL] [ORNL] [MDRES]		46900 [PAL] [ORNL] [MDRES]		18900 [PAL] [ORNL] [MDRES]		21100 [PAL] [ORNL] [MDRES]		23700 [PAL] [ORNL] [MDRES]		16500 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	5.3		8.3		15.4 [PAL] [SSL]		8.3		9.5		11.3 [PAL] [SSL]		7.9	
7439-93-2	**LITHIUM**	NA	2	**7.6 [PAL] [OPLNT]**		**13.2 [PAL] [OPLNT]**		**23.2 [PAL] [ORNL] [OPLNT]**		**11.5 [PAL] [OPLNT]**		**11.3 [PAL] [OPLNT]**		**13.3 [PAL] [OPLNT]**		**8.6 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	556		817		1440		652		584		885		650	
7439-96-5	MANGANESE	4130	160	31.6		24.9		42.7		13.8		17.8		220 [PAL] [ORNL] [MDRES]		104	
7439-97-6	MERCURY	0.18	0.058	0.02	J	0.015	J	0.043	J	0.011	J	0.0085	J	0.018	J	0.012	J
7440-02-0	NICKEL	18.2	38	4.9	L	7.5	L	13.9	L	6.5	L	7.1	L	13.6	L	9.7	L
7440-09-7	POTASSIUM	2610	NA	854		1300		1780		992		998		1200		849	
7782-49-2	SELENIUM	13.3	0.52	0.032	UL	0.085	J	0.098	J	0.14	L	0.26	L	0.12	L	0.086	J
7440-22-4	SILVER	11.4	4.2	0.081	UL	0.082	UL	0.33	UL	0.16	UL	0.16	UL	0.16	UL	0.083	UL
7440-23-5	SODIUM	258	NA	15.5	J	32.8		35	J	16.8	J	16.4	J	20.5	J	14.7	J
7440-24-6	STRONTIUM	NA	120	2.9		5.5		7.9		4.1		4.2		6.3		5.1	
7440-31-5	**TIN**	NA	0.89	0.82	U	0.82	U	3.3	U	1.6	U	1.6	U	1.6	U	0.83	U
7440-62-2	VANADIUM	194	7.8	21.2 [PAL] [MDRES] [SSL]	J	29.6 [PAL] [MDRES] [SSL]	J	57.9 [PAL] [ORNL] [MDRES] [SSL]	J	29.1 [PAL] [MDRES] [SSL]	J	30.9 [PAL] [MDRES] [SSL]	J	26.8 [PAL] [MDRES] [SSL]	J	20.3 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	13.6	L	21.9	L	43.3	L	19.6	L	22.1	L	34.4	L	24.3	L
	Miscellaneous																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA														
TTNUS288	PERCENT MOISTURE (%)	NA	NA														
TTNUS002	PH (s.u)	NA	NA														
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA														
TTNUS046	TOTAL SOLIDS(%)	NA	NA														

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

column62			parameter			column64		column66		column68		column70		column71		column73		column76	
X02SB0260204			nsample			X02SB0260406		X02SB0270204		X02SB0270406		X02SB0310204		X02SB0310204-AVG		X02SB0310204-D		X02SB0310406	
X02SB026			location			X02SB026		X02SB027		X02SB027		X02SB031		X02SB031		X02SB031		X02SB031	
00810_2010061			project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
X02SB0260204			sample_coc			X02SB0260406		X02SB0270204		X02SB0270406		X02SB0310204		X02SB0310204-AVG		FD031510-03		X02SB0310406	
20100312			gis_date			20100312		20100312		20100312		20100315		20100315		20100315		20100315	
NM			qc_type			NM		NM		NM		NM		NM		FD		NM	
NORMAL			sacode			NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL	
SO			matrix			SO		SO		SO		SO		SO		SO		SO	
			duplicate													X02SB0310204			
2.00			top_depth			4.00		2.00		4.00		2.00		2.00		2.00		4	
4.00			bottom_dep			6.00		4.00		6.00		4.00		4.00		4.00		6	
FT			depth_unit			FT		FT		FT		FT		FT		FT		FT	
SB			submatrix			SB		SB		SB		SB		SB		SB		SB	
061			z			063		065		067		069		070		072		075	
c_061		cas	x	utl95conv	minorpal	c_063		c_065		c_067		c_069		c_070		c_072		c_075	
			Explosives (mg/kg)																
0.2	U	99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.2	U	99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.25	U	118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	
0.2	U	121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.2	U	606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.2	U	35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.2	U	88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.25	U	618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	
0.2	U	99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.2	U	19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.2	U	99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.2	UL	2691-41-0	HMX	NA	380	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	
0.2	U	98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
1.2	U	55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
1.2	U	78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
0.2	U	121-82-4	RDX	NA	5.5	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
0.2	U	479-45-8	TETRYL	NA	24	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
			Inorganics (mg/kg)																
31400 [PAL] [ORNL] [MDRES]		7429-90-5	ALUMINUM	35400	7700	17800 [PAL] [ORNL] [MDRES]		21400 [PAL] [ORNL] [MDRES]		11700 [PAL] [ORNL] [MDRES]		25300 [PAL] [ORNL] [MDRES]		21650 [PAL] [ORNL] [MDRES]		18000 [PAL] [ORNL] [MDRES]		18700 [PAL] [ORNL] [MDRES]	
0.16	UL	7440-36-0	ANTIMONY	1.8	0.27	0.16	UL	0.033	J	0.032	UL	0.033	UL	0.0325	UL	0.032	UL	0.065	
5.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	7440-38-2	ARSENIC	18.9	0.026	4.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	2 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	4 [PAL] [ORNL] [MDRES] [MDSGW]	
68.1		7440-39-3	BARIUM	134	330	31.3		63	J	27.2	J	81.5	J	74.2	J	66.9	J	102	
0.67	J	7440-41-7	BERYLLIUM	3.3	16	0.55	J	0.63	J	0.25	J	1.3	L	1.2	L	1.1	L	1.7	
0.16	U	7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.16	U	0.082	U	0.16	U	0.16	U	0.16	U	0.16	
265		7440-70-2	CALCIUM	2590	NA	179		315	L	73.8	L	30.5	L	28.45	L	26.4	L	53.1	
32.5 [PAL] [SSL]	K	7440-47-3	CHROMIUM	60.1	26	21.8	K	28 [PAL] [SSL]	L	13.1	L	26.2 [PAL] [SSL]	L	23.85	L	21.5	L	24.1	
5.5 [PAL] [ORNL]		7440-48-4	COBALT	133	2.3	2.8 [PAL] [ORNL]		5 [PAL] [ORNL]		1.9		8.1 [PAL] [ORNL]		7.55 [PAL] [ORNL]		7 [PAL] [ORNL]		11.2 [PAL] [ORNL]	
15.6		7440-50-8	COPPER	48.6	28	7.3		9.7	L	5.8	L	20	L	18.35	L	16.7	L	20.3	
21400 [PAL] [ORNL] [MDRES]		7439-89-6	IRON	83100	5500	18800 [PAL] [ORNL] [MDRES]		22900 [PAL] [ORNL] [MDRES]		5320		33300 [PAL] [ORNL] [MDRES]		31050 [PAL] [ORNL] [MDRES]		28800 [PAL] [ORNL] [MDRES]		33700 [PAL] [ORNL] [MDRES]	
12.5 [PAL] [SSL]		7439-92-1	LEAD	40.5	11	7		12.9 [PAL] [SSL]		6.4		14.2 [PAL] [SSL]		13.3 [PAL] [SSL]		12.4 [PAL] [SSL]		15.6 [PAL] [SSL]	
22.4 [PAL] [ORNL] [OPLNT]		**7439-93-2**	**LITHIUM**	NA	2	**9.2 [PAL] [OPLNT]**		**19.8 [PAL] [ORNL] [OPLNT]**		**8.8 [PAL] [OPLNT]**		**25.3 [PAL] [ORNL] [OPLNT]**		**23.1 [PAL] [ORNL] [OPLNT]**		**20.9 [PAL] [ORNL] [OPLNT]**		**23.2 [PAL] [ORNL] [OPLNT]**	
1630		7439-95-4	MAGNESIUM	2640	4400	709		1650		632		1640		1475		1310		1790	
56.2	J	7439-96-5	MANGANESE	4130	160	52.5	J	39.5		15.5		66		62.3		58.6		72.2	
0.035	UJ	7439-97-6	MERCURY	0.18	0.058	0.034	UJ	0.026	J	0.013	J	0.039	J	0.0425	J	0.046	J	0.036	
15.2		7440-02-0	NICKEL	18.2	38	6.6		13.2	L	5.6	L	23 [BKG]	L	21.35 [BKG]	L	19.7 [BKG]	L	28.9 [BKG]	
2300		7440-09-7	POTASSIUM	2610	NA	1010		2090		1040		2380		2060		1740		2040	
0.16	UL	7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.032	UL	0.032	UL	0.13	L	0.1095	J	0.089	J	0.14	
0.16	UL	7440-22-4	SILVER	11.4	4.2	0.16	UL	0.16	UL	0.082	UL	0.16	UL	0.16	UL	0.16	UL	0.16	
59.5		7440-23-5	SODIUM	258	NA	17.2	J	39.7	J	20.8	J	47.9	J	41.75	J	35.6	J	54.6	
8.5	K	7440-24-6	STRONTIUM	NA	120	4.8	K	9.9		4.3		10.1		9.4		8.7		12.3	
1.7	U	**7440-31-5**	**TIN**	NA	0.89	1.6	U	1.6	U	0.82	U	1.6	U	1.6	U	1.6	U	1.7	
54.6 [PAL] [ORNL] [MDRES] [SSL]	K	7440-62-2	VANADIUM	194	7.8	28.8 [PAL] [MDRES] [SSL]	K	47.4 [PAL] [ORNL] [MDRES] [SSL]	J	21 [PAL] [MDRES] [SSL]	J	40.8 [PAL] [ORNL] [MDRES] [SSL]	J	36.8 [PAL] [MDRES] [SSL]	J	32.8 [PAL] [MDRES] [SSL]	J	37 [PAL] [MDRES] [SSL]	
39.8		**7440-66-6**	**ZINC**	70.4	46	19.5		36.2	L	15.2	L	64.2 [PAL] [SSL]	L	59.25 [PAL] [SSL]	L	54.3 [PAL] [SSL]	L	**77.8 [BKG] [PAL] [SSL]**	
			Miscellaneous																
		TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA														
		TTNUS288	PERCENT MOISTURE (%)	NA	NA														
		TTNUS002	PH (s.u)	NA	NA														
		TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA														
		TTNUS046	TOTAL SOLIDS(%)	NA	NA														

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	column78 X02SB0320204 X02SB032 00810_2010061 X02SB0320204 20100313 NM ORIG SO	
1.00		2.00
3.00		4.00
	FT SB 077 c_077	

U	0.2	U
U	0.2	U
U	0.25	U
U	0.2	U
U	0.2	U
U	0.2	U
U	0.2	U
U	0.25	U
U	0.2	U
U	0.2	U
U	0.2	U
UL	0.2	UL
U	0.2	U
U	1.2	U
U	1.2	U
U	0.2	U
U	0.2	U

	12500 [PAL] [ORNL] [MDRES]	
UL	0.032	UL
L	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L
J	61.3	J
L	0.55	L
U	0.082	U
L	136	L
L	12	L
	4.1 [PAL] [ORNL]	
L	4.6	L
	9130 [PAL] [ORNL] [MDRES]	
	8.3	
	8.1 [PAL] [OPLNT]	
	720	
	121	
J	0.015	J
L	7.8	L
	729	
L	0.032	UL
UL	0.082	UL
	13.7	J
	5	
U	0.82	U
J	23.4 [PAL] [MDRES] [SSL]	J
L	26.6	L

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column79		column81		column84		column86		column88	
	nsample			X02SB0320204-AVG		X02SB0320204-D		X02SB0320406		X02SB0350204		X02SB0350406	
	location			X02SB032		X02SB032		X02SB032		X02SB035		X02SB035	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X02SB0320204-AVG		FD031310-01		X02SB0320406		X02SB0350204		X02SB0350406	
	gis_date			20100313		20100313		20100313		20100315		20100315	
	qc_type			NM		FD		NM		NM		NM	
	sacode			AVG		DUP		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO	
	duplicate					X02SB0320204							
	top_depth			2.00		2.00		4.00		2.00		4.00	
	bottom_dep			4.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB	
	z			078		080		083		085		087	
cas	x	utl95conv	minorpal	c_078		c_080		c_083		c_085		c_087	
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.245	U	0.24	U	0.24	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.245	U	0.24	U	0.24	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
	Inorganics (mg/kg)												
7429-90-5	ALUMINUM	35400	7700	13400 [PAL] [ORNL] [MDRES]		14300 [PAL] [ORNL] [MDRES]		12000 [PAL] [ORNL] [MDRES]		20800 [PAL] [ORNL] [MDRES]		14600 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.032	UL	0.033	UL	0.033	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	2 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	134	330	60.75	J	60.2	J	23.3	J	66.7	J	26.6	J
7440-41-7	BERYLLIUM	3.3	16	0.535	L	0.52	L	0.24	J	0.65	L	0.26	J
7440-43-9	CADMIUM	0.61	0.36	0.0815	U	0.081	U	0.083	U	0.082	U	0.083	U
7440-70-2	CALCIUM	2590	NA	149	L	162	L	162	L	121	L	35.3	L
7440-47-3	CHROMIUM	60.1	26	13.05	L	14.1	L	16.5	L	18.4	L	13	L
7440-48-4	COBALT	133	2.3	4.25 [PAL] [ORNL]		4.4 [PAL] [ORNL]		2.2		7.3 [PAL] [ORNL]		2.8 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	4.6	L	4.6	L	8.5	L	7.1	L	7.1	L
7439-89-6	IRON	83100	5500	9815 [PAL] [ORNL] [MDRES]		10500 [PAL] [ORNL] [MDRES]		9870 [PAL] [ORNL] [MDRES]		16600 [PAL] [ORNL] [MDRES]		10900 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	9.4		10.5		8.6		10.8		6.9	
7439-93-2	**LITHIUM**	NA	2	**8.95 [PAL] [OPLNT]**		**9.8 [PAL] [OPLNT]**		**10.3 [PAL] [OPLNT]**		**13.1 [PAL] [OPLNT]**		**9.7 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	789		858		688		1280		626	
7439-96-5	MANGANESE	4130	160	114		107		19.8		91.8		24.5	
7439-97-6	MERCURY	0.18	0.058	0.016	J	0.017	J	0.016	J	0.034	J	0.015	J
7440-02-0	NICKEL	18.2	38	8.25	L	8.7	L	6.7	L	11.9	L	6.7	L
7440-09-7	POTASSIUM	2610	NA	864.5		1000		970		1180		882	
7782-49-2	SELENIUM	13.3	0.52	0.032	UL	0.032	UL	0.033	UL	0.033	UL	0.033	UL
7440-22-4	SILVER	11.4	4.2	0.0815	UL	0.081	UL	0.083	UL	0.082	UL	0.083	UL
7440-23-5	SODIUM	258	NA	17.2	J	20.7	J	14.7	J	21.5	J	12	J
7440-24-6	STRONTIUM	NA	120	5.6		6.2		4.8		5.2		3.1	
7440-31-5	**TIN**	NA	0.89	0.815	U	0.81	U	0.83	U	0.82	U	0.83	U
7440-62-2	VANADIUM	194	7.8	24.3 [PAL] [MDRES] [SSL]	J	25.2 [PAL] [MDRES] [SSL]	J	25.5 [PAL] [MDRES] [SSL]	J	30 [PAL] [MDRES] [SSL]	J	23.9 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	28.4	L	30.2	L	19.1	L	36.3	L	19.7	L
	Miscellaneous												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA							36.7		43.9	
TTNUS288	PERCENT MOISTURE (%)	NA	NA							18.8		15.6	
TTNUS002	PH (s.u)	NA	NA							4.43		4.76	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA							2520		633	J
TTNUS046	TOTAL SOLIDS(%)	NA	NA							81.2		84.4	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-6

SEDIMENT SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter		column2		column4	column5	column6	column11	column7	column8	column9	column10	column12	column13	column14	column15	column16	column17	column18	column19
	nsample		X02SD001		X02SD002	X02SD002-QUAL	X02SD003	X02SD003-QUAL	X02SD003-AVG	X02SD003-AVG-QUAL	X02SD003-D	X02SD003-D-QUAL	X02SD004	X02SD004-QUAL	X02SD005	X02SD005-QUAL	X02SD006	X02SD006-QUAL	X02SD007	X02SD007-QUAL
	location		X02SD001		X02SD002	X02SD002	X02SD003	X02SD003	X02SD003	X02SD003	X02SD003	X02SD003	X02SD004	X02SD004	X02SD005	X02SD005	X02SD006	X02SD006	X02SD007	X02SD007
	project_no		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc		X02SD001		X02SD002		X02SD003		X02SD003-AVG		FD020310-01		X02SD004		X02SD005		X02SD006		X02SD007	
	gis_date		20100203		20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203
	matrix		SD		SD		SD		SD		SD		SD		SD		SD		SD	
	duplicate										X02SD003									
	top_depth		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50	
	depth_unit		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	z		001		003	004	005	010	006	007	008	009	011	012	013	014	015	016	017	018
cas	x	utl95	c_001		c_003	c_004	c_005	c_010	c_006	c_007	c_008	c_009	c_011	c_012	c_013	c_014	c_015	c_016	c_017	c_018
	Explosives (mg/kg)																			
99-35-4	1,3,5-TRINITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.20	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.20	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	0.25	U	0.25	U	0.25	U	0.25	UL	0.25	UL	0.24	UL	0.25	UL	0.25	UL	0.25	UL
99-08-1	3-NITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	0.2	U	0.2	U	0.2	U	0.20	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
479-45-8	TETRYL	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																			
7429-90-5	ALUMINUM	52362	4650		15200		14000	J	19450	J	24900	J	17200	J	26800	J	19700	J	23800	J
7440-36-0	ANTIMONY	NA	0.037	B	0.21	B	0.21	B	0.205	B	0.20	B	0.092	B	0.055	B	0.054	B	0.23	B
7440-38-2	ARSENIC	63	1.3		6.2 [PAL] [ORNL]		6.5 [PAL] [ORNL]		6.9 [PAL] [ORNL]		7.3 [PAL] [ORNL]		2.1		2		2.5		1.9	
7440-39-3	BARIUM	577	37.3	K	114 [PAL] [NOAA]	K	101 [PAL] [NOAA]	K	97.85 [PAL] [NOAA]	K	94.7 [PAL] [NOAA]	K	115 [PAL] [NOAA]	K	124 [PAL] [NOAA]	K	105 [PAL] [NOAA]	K	78.3 [PAL] [NOAA]	K
7440-41-7	BERYLLIUM	10.9	0.24	J	2.3		0.97		0.935		0.90		1.1		1.2		0.96		0.79	
7440-43-9	CADMIUM	1.85	0.082	U	1.2 [PAL] [BTAG]		0.54		0.53		0.52		1.1 [PAL] [BTAG]		1 [PAL] [BTAG]		0.90		0.97	
7440-70-2	CALCIUM	88137	139		5710		4380		4300	K	4220	K	875	K	1010	K	629	K	785	K
7440-47-3	CHROMIUM	79.2	7.7	K	16.1	K	15.1	K	14.55	K	14	K	29	K	29.4	K	31.5	K	19.2	K
7440-48-4	COBALT	118	2.8		43.1 [PAL] [ORNL]		15		14.45		13.9		5.9		5.9		6.2		4.1	
7440-50-8	COPPER	297	5.3		25.9		23.2		21.1		19		30.4		41.6 [PAL] [BTAG]		24.9		25.7	
7439-89-6	IRON	193218	3760		17300		14100		13200		12300		8810		7830		10700		6930	
7439-92-1	LEAD	476	9.4		48.8 [PAL] [BTAG]		44.1 [PAL] [BTAG]		44.85 [PAL] [BTAG]		45.6 [PAL] [BTAG]		36.7 [PAL] [BTAG]		32.2		36.3 [PAL] [BTAG]		42 [PAL] [BTAG]	
7439-93-2	LITHIUM	NA	5.6		14.9		13.5		13.2		12.9		18.2		18		20.2		11.3	
7439-95-4	MAGNESIUM	19043	398	K	2250	K	1910	K	1890	K	1870	K	1050	K	1090	K	1190	K	719	K
7439-96-5	MANGANESE	2561	31.4		234		143		141	K	139	K	47.6	K	53.2	K	50	K	40.6	K
7439-97-6	MERCURY	0.778	0.071		0.24 [PAL] [BTAG]		0.20 [PAL] [BTAG]		0.175	J	0.15	J	0.18		0.16		0.20 [PAL] [BTAG]	J	0.42 [PAL] [BTAG]	
7440-02-0	NICKEL	382	6.3		37.1 [PAL] [BTAG]		21.2		20.4		19.6		18.6		19.4		18.6		13.5	
7440-09-7	POTASSIUM	5061	698	K	1160	K	958	K	949.5	K	941	K	1220	K	1310	K	1490	K	909	K
7782-49-2	SELENIUM	6.45	0.16		1.2	L	0.99	L	1.145	L	1.3	L	0.76	L	0.91	L	0.43	L	0.50	L
7440-22-4	SILVER	0.92	0.082	U	0.083	U	0.085	J	0.0975	J	0.11	J	0.083	U	0.083	U	0.081	U	0.083	U
7440-23-5	SODIUM	472	23	J	763 [BKG]		700 [BKG]		702 [BKG]	K	704 [BKG]	K	77.9	K	84.2	K	67.1	K	51.4	K
7440-24-6	STRONTIUM	NA	5.2	K	50.6	K	40.4	K	39.8	K	39.2	K	10.2	K	11.4	K	9.3	K	9	K
7440-31-5	TIN	NA	0.82	U	2	J	1.6	J	1.5	J	1.4	J	1	J	1.2	J	1.4	J	1	J
7440-62-2	VANADIUM	196	12.5	K	53.1	K	43.4	K	41.75	K	40.1	K	34.4	K	32.9	K	40.2	K	29.5	K
7440-66-6	ZINC	1660	17.7		215 [PAL] [BTAG]		129 [PAL] [BTAG]		124.5 [PAL] [BTAG]		120		79.8		75.3		73		63.7	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U = indicates that the
chemical was not
method could not detect
present; however, the
present; however, the
present; however, the

TABLE 5-7

GROUNDWATER SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter		column2		column3		column5		column8		column10		column12		column14		column16	
	nsample		X02GW001		X02GW001-AVG		X02GW001-D		X02GW002		X02GW003		X02GW004		X02GW005		X02GW006	
	location		25MW01		25MW01		25MW01		25MW02		25MW03		X02TW001/SB032		X02TW002/SB029		X02TW003/SB012	
	project_no		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010051		00810_2010051	
	sample_coc		X02GW001		X02GW001-AVG		FD031410-03		X02GW002		X02GW003		X02GW004		X02GW005		X02GW006	
	gis_date		20100314		20100314		20100314		20100315		20100315		20100315		20100316		20100316	
	qc_type		NM		NM		FD		NM		NM		NM		NM		NM	
	sacode		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix		GW		GW		GW		GW		GW		GW		GW		GW	
	duplicate						X02GW001											
	top_depth		-9999		-9999		-9999		-9999		-9999		-9999		-9999		-9999	
	bottom_dep		-9999		-9999		-9999		-9999		-9999		-9999		-9999		-9999	
	z		001		002		004		007		009		011		013		015	
cas	x	minorpal	c_001		c_002		c_004		c_007		c_009		c_011		c_013		c_015	
	Explosives (ug/L)																	
99-35-4	1,3,5-TRINITROBENZENE	110			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
99-65-0	1,3-DINITROBENZENE	0.37			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	2.2			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
121-14-2	2,4-DINITROTOLUENE	0.22			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	3.7			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUE	7.3			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
88-72-2	2-NITROTOLUENE	0.31			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
99-08-1	3-NITROTOLUENE	0.37			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUE	7.3			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
99-99-0	4-NITROTOLUENE	4.2			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
2691-41-0	HMX	180			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
98-95-3	NITROBENZENE	0.12			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
55-63-0	NITROGLYCERIN	0.37			1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.5	UJ	1.4	UJ
78-11-5	PETN	NA			1.4	U	1.4	U	1.4	U	1.4	U	1.5	U	1.5	U	1.4	U
121-82-4	RDX	0.61			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
479-45-8	TETRYL	15			0.29	U	0.29	U	0.29	U	0.28	U	0.3	U	0.29	U	0.29	U
	Inorganics (ug/L)																	
7429-90-5	**ALUMINUM**	50	**910 [PAL] [MCL] [MDE]**	J	**485.5 [PAL] [MCL] [MDE]**	J	**61.0 [PAL] [MCL] [MDE]**	J	**140 [PAL] [MCL] [MDE]**	J	**60.0 [PAL] [MCL] [MDE]**	J	**200 [PAL] [MCL] [MDE]**	J	**4300 [PAL] [ORNLTAP] [MCL] [MDE]**		**120 [PAL] [MCL] [MDE]**	
7440-36-0	ANTIMONY	1.5	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U
7440-38-2	**ARSENIC**	0.045	1	U	1	U	1	U	1	U	1	U	1	U	**2.2 [PAL] [ORNLTAP]**	K	**1.4 [PAL] [ORNLTAP]**	K
7440-39-3	BARIUM	730	29	J	54.5	J	80	J	44	J	35	J	34	J	47		20	
7440-41-7	BERYLLIUM	4	0.3	UL	0.235	JL	0.32	J	0.3	UL	0.3	UL	0.3	UL	0.3	U	0.3	U
7440-43-9	CADMIUM	1.8	0.37	U	0.2825	J	0.38	J	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U
7440-70-2	CALCIUM	NA	1300	J	1350	J	1400		420		2300		2600		1000		1500	
7440-47-3	CHROMIUM	100	6.7		3.85		2	U	2	U	2	U	2	U	5.7	J	2	U
7440-48-4	**COBALT**	1.1	**16.0 [PAL] [ORNLTAP]**		**10.3 [PAL] [ORNLTAP]**	J	**4.6 [PAL] [ORNLTAP]**	J	2	U	2	U	2	U	**3.1 [PAL] [ORNLTAP]**	J	**4.7 [PAL] [ORNLTAP]**	J
7440-50-8	COPPER	150	6.7	J	4.25	J	3.6	U	7.4	J	3.6	U	22		6.3	B	4	B
7439-89-6	**IRON**	300	**1200 [PAL] [MCL] [MDE]**	J	**631.5 [PAL] [MCL] [MDE]**	J	63	J	130	J	91	J	**720 [PAL] [MCL] [MDE]**	J	**5300 [PAL] [ORNLTAP] [MCL] [MDE]**	J	**930 [PAL] [MCL] [MDE]**	J
7439-92-1	LEAD	15	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	3	J
7439-93-2	LITHIUM	7.3	36	U	36	U	36	U	36	U	36	U	36	U	36	U	36	U
7439-95-4	MAGNESIUM	NA	740	J	2520	J	4300	J	980	J	720	J	2100	J	910		790	
7439-96-5	**MANGANESE**	50	47	J	**78.5 [PAL] [MCL] [MDE]**	J	**110 [PAL] [ORNLTAP] [MCL] [MDE]**	J	**150 [PAL] [ORNLTAP] [MCL] [MDE]**	J	8.3	J	31	J	**51.0 [PAL] [MCL] [MDE]**		48	
7439-97-6	MERCURY	1.1	0.077	UL	0.077	UL	0.077	UL	0.077	UL	0.077	UL	0.077	UL	0.077	U	0.077	U
7440-02-0	NICKEL	73	9.7	J	15.85	J	22		7.3	U	7.3	U	7.3	U	7.3	U	7.3	U
7440-09-7	POTASSIUM	NA	2200		2550		2900		790		1500		1200		1500	J	1100	J
7782-49-2	SELENIUM	18	3.5	J	3.8	J	4.1	J	3.5	J	4.1	J	4	J	3.9	B	3.5	B
7440-22-4	SILVER	18	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
7440-23-5	SODIUM	NA	3400		4800		6200		3000		2600		5000		4100		3500	
7440-24-6	STRONTIUM	2200	10		13		16		8		15		21		11		10	
7440-31-5	TIN	2200	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U
7440-62-2	**VANADIUM**	3.7	**6.0 [PAL] [MDE]**	J	3.5	J	2	U	2	U	2	U	2	U	**10.0 [PAL] [MDE]**		2	U
7440-66-6	ZINC	1100	13	J	31.5	J	50		15	J	7.3	U	41		12	J	8.9	J
	Inorganics, Filtered (ug/L)																	
7429-90-5	**ALUMINUM**	50	**140 [PAL] [MCL] [MDE]**	J	**190 [PAL] [MCL] [MDE]**	J	**240 [PAL] [MCL] [MDE]**	J							**63 [PAL] [MCL] [MDE]**	J	26	U
7440-36-0	ANTIMONY	1.5	0.66	U	0.52	J	0.71	J							0.66	U	0.66	U
7440-38-2	**ARSENIC**	0.045	1	U	1	U	1	U							**1.2 [PAL] [ORNLTAP]**	J	1	U
7440-39-3	BARIUM	730	22		19		16								28		17	
7440-41-7	BERYLLIUM	4	0.72	B	0.86	B	1	B							0.49	B	0.33	U
7440-43-9	CADMIUM	1.8	0.33	U	0.33	U	0.33	U							0.33	U	0.33	U
7440-70-2	CALCIUM	NA	1200		1200		1200								1100		1400	
7440-47-3	CHROMIUM	100	4.8	J	2.8	J	1.6	U							1.6	U	1.6	U
7440-48-4	**COBALT**	1.1	**15 [PAL] [ORNLTAP]**		**15.5 [PAL] [ORNLTAP]**		**16 [PAL] [ORNLTAP]**								**3 [PAL] [ORNLTAP]**	J	**4.9 [PAL] [ORNLTAP]**	J
7440-50-8	COPPER	150	4.8	J	4.5	J	4.2	J							3.3	U	3.3	U
7439-89-6	**IRON**	300	**730 [PAL] [MCL] [MDE]**	J	**490 [PAL] [MCL] [MDE]**	J	250	J							**3600 [PAL] [ORNLTAP] [MCL] [MDE]**		**610 [PAL] [MCL] [MDE]**	J
7439-92-1	LEAD	15	2	UL	2	UL	2	UL							2	UL	2	UL
7439-93-2	LITHIUM	7.3	33	U	33	U	33	U							33	U	33	U
7439-95-4	MAGNESIUM	NA	680		615		550								710		760	
7439-96-5	MANGANESE	50	37		38		39								49		47	
7439-97-6	MERCURY	1.1	0.066	U	0.2015		0.37								0.066	U	0.066	U
7440-02-0	NICKEL	73	11	J	11	J	11	J							6.6	U	6.6	U
7440-09-7	POTASSIUM	NA	2000		1800		1600								880		1100	
7782-49-2	SELENIUM	18	1.6	U	1.6	U	1.6	U							1.6	U	1.6	U
7440-22-4	SILVER	18	1.3	U	1.3	U	1.3	U							1.3	U	1.3	U
7440-23-5	SODIUM	NA	3500		3500		3500								4400		3700	
7440-24-6	STRONTIUM	2200	9.2		8.55		7.9								9.1		10	
7440-31-5	TIN	2200	6.6	U	6.6	U	6.6	U							6.6	U	6.6	U
7440-62-2	VANADIUM	3.7	3.5	J	2.15	J	1.6	U							1.6	U	1.6	U
7440-66-6	ZINC	1100	9.6	J	8.8	J	8	J							6.6	U	6.6	U

ug/L = micrograms per liter
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-8

Tetra Tech NUS, Inc.

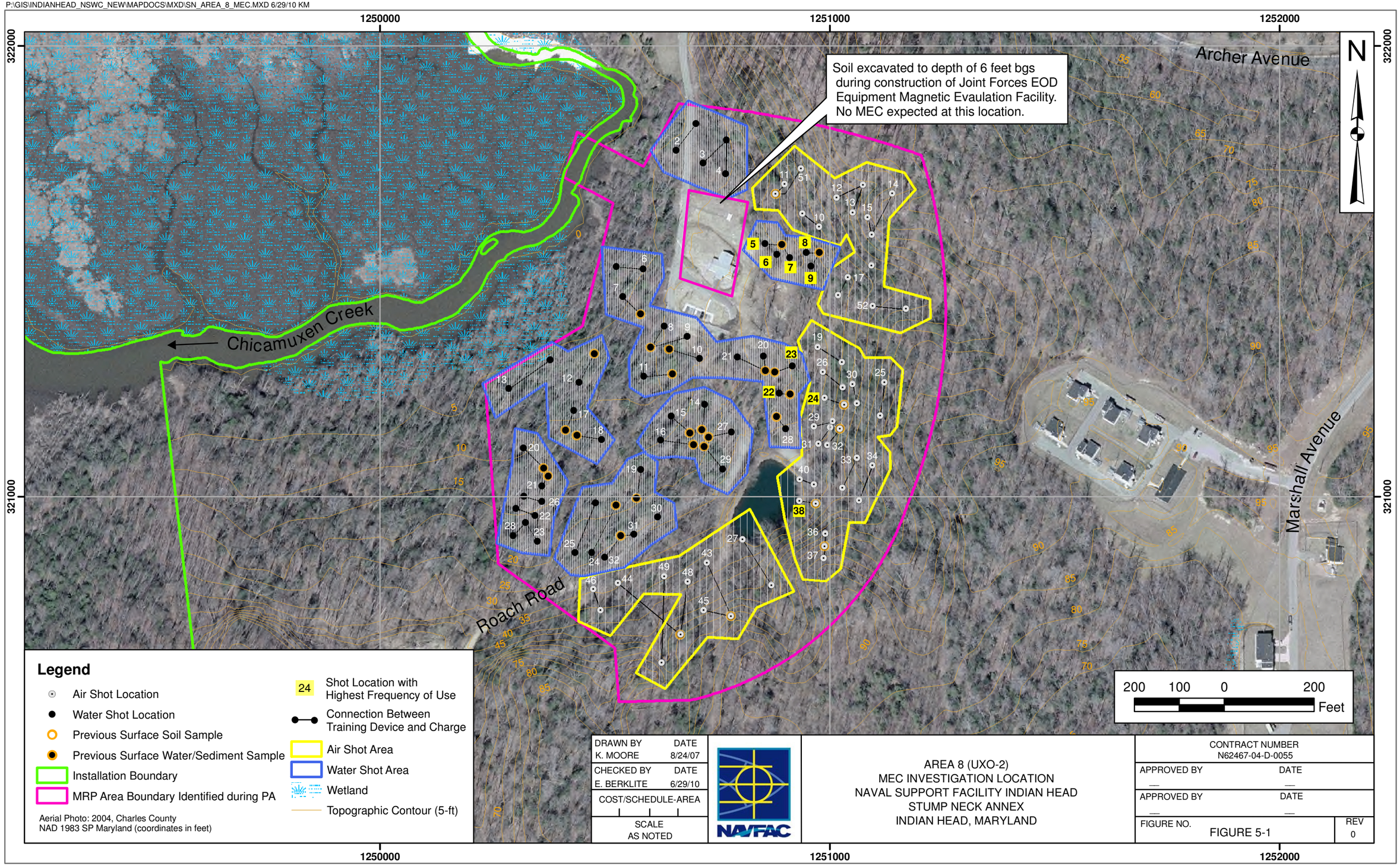
GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: Indian Head Ten Munitions Sites
Project No.: 112G00810
Location: UXO 02 Area 8
Personnel: TtNUS
Weather Conditions:
Measuring Device: Water level indicator
Tidally Influenced: Yes ____ No __x__
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
25MW01/ X02GW001	3/14/2010	1505	6.24	17.35	0.89	NA	5.35	
25MW02/ X02GW002	3/14/2010	1200	24.66	20.19	7.74	NA	16.92	
25MW03/ X02GW003	3/14/2010	905	74.17	44.00	29.98	NA	44.19	
X02GW004	3/14/2010	1425	NA	20.16	5.67	NA		
X02GW005	3/14/2010	810	NA	15.12	3.51	NA		
X02GW006	3/14/2010	1105	NA	22.61	2.50	NA		

* All measurements to the nearest 0.01 foot

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD\SN_AREA_8_MEC.MXD 6/29/10 KM



Legend

- Air Shot Location
- Water Shot Location
- Previous Surface Soil Sample
- Previous Surface Water/Sediment Sample
- Installation Boundary
- MRP Area Boundary Identified during PA
- 24 Shot Location with Highest Frequency of Use
- Connection Between Training Device and Charge
- Air Shot Area
- Water Shot Area
- Wetland
- Topographic Contour (5-ft)

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	8/24/07
CHECKED BY	DATE
E. BERKLITE	6/29/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

AREA 8 (UXO-2)
MEC INVESTIGATION LOCATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 5-1	0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD\SN_AREA_8_MEC_FINDS.MXD 7/9/10 KM

1250000 1251000 1252000

322000 321000

Soil excavated to depth of 6 feet bgs during construction of Joint Forces EOD Equipment Magnetic Evaulation Facility. No MEC expected at this location.

Archer Avenue

Marshall Avenue

Roach Road

Chicamuxen Creek

N

Legend

- Munitions Debris
- MPPEH
- Subsurface Anomalies
- Installation Boundary
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

200 100 0 200 Feet

DRAWN BY K. MOORE	DATE 1/29/10
CHECKED BY E. BERKLITE	DATE 7/9/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

AREA 8 (UXO-2)
MEC FINDS/SUBSURFACE ANOMALIES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055	
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 5-2	REV 0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD\SN_AREA_8_SAMPLING.MXD 7/9/10 KM

1250000 1251000 1252000

322000 321000

Archer Avenue

Marshall Avenue

Roach Road

Chicamuxen Creek

X02SB001 X02SB002 X02SB003 X02SB004 X02SB005 X02SB006 X02SB007 X02SB008 X02SB009 X02SB010 X02SB011 X02SB012 X02TW003 X02SB013 X02SB014 X02SB015 X02SB016 X02SB017 X02SB018 X02SB019 X02SB020 X02SB021 X02SB022 X02SE023 X02SB024 X02SB025 X02SB026 X02SB027 X02SB028 X02SB029 TW002 X02SB030 X02SB031 X02SB032 X02TW001 X02SB033 X02SB034 X02SB035 X02SB036 X02SB037 X02SB038 X02SB039 X02SB040

X02SD001 X02SD002 X02SD003 X02SD004 X02SD005 X02SD006 X02SD007

25MW01 25MW02 25MW03

Legend

- Soil Sample Location
- Sediment Sample Location
- Munitions Debris
- MPPEH
- Monitoring Well
- Subsurface Anomalies
- Installation Boundary
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

200 100 0 200 Feet

DRAWN BY K. MOORE	DATE 1/29/10
CHECKED BY E. BERKLITE	DATE 7/9/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

AREA 8 (UXO-2)
SAMPLE LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055	
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 5-3	REV 0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD\SN_AREA_8_SS_TAGS.MXD 7/9/10 KM

1250000 1251000 1252000

322000 321000

Archer Avenue

Marshall Avenue

Roach Road

Chicamuxen Creek

X02SB001 NO EXC

X02SB002 NO EXC

X02SB003
Depth= 0 - 0.5'
Inorganics (mg/kg)
TIN 1.3
Depth= 0 - 2.0'
Inorganics (mg/kg)
TIN 1.2

X02SB004 NO EXC

X02SB005 NO EXC

X02SB006 NO EXC

X02SB007 NO EXC

X02SB008 NO EXC

X02SB009
Depth= 0 - 0.5'
Inorganics (mg/kg)
LEAD 72.1 [BKG] [PAL] [SSL]
ZINC 52.7 [BKG] [PAL] [SSL]
TIN 1.1

X02SB010
Depth= 0 - 2.0'
Inorganics (mg/kg)
CHROMIUM 1570 K [BKG] [PAL] [SSL]

X02SB011 NO EXC

X02SB012 NO EXC

X02SB013 NO EXC

X02SB014 NO EXC

X02SB015 NO EXC

X02SB016 NO EXC

X02SB017 NO EXC

X02SB018
Depth= 0 - 0.5'
Inorganics (mg/kg)
MAGNESIUM 11700 K [BKG] [PAL] [BTAG]

X02SB019
Depth= 0 - 0.5'
Inorganics (mg/kg)
COPPER 65.5 [BKG] [PAL] [SSL]
MERCURY 0.32 L [BKG] [PAL] [BTAG]
Depth= 0 - 2.0'
Inorganics (mg/kg)
COPPER 77.4 [BKG] [PAL] [SSL]
MERCURY 0.18 L [BKG] [PAL] [BTAG]

X02SB020 NO EXC

X02SB021 NO EXC

X02SB022 NO EXC

X02SB023 NO EXC

X02SB024 NO EXC

X02SB025 NO EXC

X02SB026
Depth= 0 - 2.0'
Inorganics (mg/kg)
TIN 0.95

X02SB027 NO EXC

X02SB028 NO EXC

X02SB029
Depth= 0 - 0.5'
Inorganics (mg/kg)
TIN 0.91

X02SB030
Depth= 0 - 2.0'
Explosives (mg/kg)
NITROBENZENE 0.05 J [PAL] [MDSGW]

X02SB031 NO EXC

X02SB032 NO EXC

X02SB033 NO EXC

X02SB034 NO EXC

X02SB035 NO EXC

X02SB036 NO EXC

X02SB037
Depth= 0 - 0.5'
Inorganics (mg/kg)
COPPER 28.8 J [BKG] [PAL] [SSL]

X02SB038 NO EXC

X02SB039 NO EXC

X02SB040 NO EXC

NOTE: Lithium exceeded the PAL of 2 mg/kg (background 95 percent UTL value was NA) at all eighty composite surface soil sampling locations, ranging from a concentration of 2.6 mg/kg, to a concentration of 12.8 mg/kg at X02SS0090006.

Legend

- Soil Boring Sample Location
- Installation Boundary
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

N

200 100 0 200 Feet

DRAWN BY	DATE
K. MOORE	5/27/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

AREA 8 (UXO-2)
SURFACE SOIL EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 5-4	0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD\SN_AREA_8_SB_TAGS.MXD 7/15/10 KM

1250000 1251000 1252000

322000 321000

X02SB001
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 9 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 12.4 [PAL] [OPLNT]

X02SB002
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 13.7 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 14.1 [PAL] [OPLNT]

X02SB003
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 19.4 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 36.8 [PAL] [ORNL] [OPLNT]

X02SB004
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 6.8 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 9.3 [PAL] [OPLNT]

X02SB005
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 10.5 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 9.9 [PAL] [OPLNT]

X02SB006
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 29.4 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 10.9 [PAL] [OPLNT]

X02SB007
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 18.7 [PAL] [ORNL] [OPLNT]
TIN 0.97 J [PAL] [BTAG]
Depth = 4.00 - 6.00'
LITHIUM 6.8 [PAL] [OPLNT]

X02SB008
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 22 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 20.9 [PAL] [ORNL] [OPLNT]

X02SB009
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 12 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 12.4 [PAL] [OPLNT]

X02SB010
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 17.1 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 10.1 [PAL] [OPLNT]

X02SB012
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 7.5 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 10.1 [PAL] [OPLNT]

X02SB014
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 9.5 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 7.6 [PAL] [OPLNT]

X02SB016
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 13.2 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 23.2 [PAL] [ORNL] [OPLNT]

X02SB018
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 11.5 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 11.3 [PAL] [OPLNT]

X02SB024
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 13.3 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 8.6 [PAL] [OPLNT]

X02SB026
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 22.4 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 9.2 [PAL] [OPLNT]

X02SB027
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 19.8 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 8.8 [PAL] [OPLNT]

X02SB031
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 25.3 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 23.2 [PAL] [ORNL] [OPLNT]
ZINC 77.8 L [BKG] [PAL] [SSL]
X02SB031 (DUP)
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 20.9 [PAL] [ORNL] [OPLNT]

X02SB035
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 13.1 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 9.7 [PAL] [OPLNT]

X02SB032
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 8.1 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 10.3 [PAL] [OPLNT]
X02SB032 (DUP)
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 9.8 [PAL] [OPLNT]

Archer Avenue

Marshall Avenue

Chicamuxen Creek

Roach Road

55 60 65 70 75 80 85 90 95

N

200 100 0 200 Feet

Legend

- Soil Boring Sample Location
- Installation Boundary
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	6/17/10
CHECKED BY	DATE
E. BERKLITE	7/15/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

AREA 8 (UXO-2)
SUBSURFACE SOIL METALS EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	
N62467-04-D-0055	
APPROVED BY	DATE
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APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 5-5	0

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1250000 1251000 1252000

322000 321000

N

Archer Avenue

Marshall Avenue

Chicamuxen Creek

Roach Road

25MW01
Inorganics (ug/L)

ALUMINUM	910	J	[PAL]	[MCL] [MDE]
COBALT	16.0		[PAL]	[ORNLTAP]
IRON	1200	J	[PAL]	[MCL] [MDE]
VANADIUM	6.0	J	[PAL]	[MDE]

Inorganics, Filtered (ug/L)

ALUMINUM	140	J	[PAL]	[MCL] [MDE]
COBALT	15		[PAL]	[ORNLTAP]
IRON	730	J	[PAL]	[MCL] [MDE]

25MW01 (DUP)
Inorganics (ug/L)

ALUMINUM	61.0	J	[PAL]	[MCL] [MDE]
COBALT	4.6	J	[PAL]	[ORNLTAP]
MANGANESE	110	J	[PAL]	[ORNLTAP] [MCL] [MDE]

25MW01 (DUP)
Inorganics, Filtered (ug/L)

ALUMINUM	240	J	[PAL]	[MCL] [MDE]
COBALT	16		[PAL]	[ORNLTAP]

25MW02
Inorganics (ug/L)

ALUMINUM	140	J	[PAL]	[MCL] [MDE]
MANGANESE	150	J	[PAL]	[ORNLTAP] [MCL] [MDE]

X02TW003/SB012
Inorganics (ug/L)

ALUMINUM	120		[PAL]	[MCL] [MDE]
ARSENIC	1.4	K	[PAL]	[ORNLTAP]
COBALT	4.7	J	[PAL]	[ORNLTAP]
IRON	930	J	[PAL]	[MCL] [MDE]

Inorganics, Filtered (ug/L)

COBALT	4.9	J	[PAL]	[ORNLTAP]
IRON	610	J	[PAL]	[MCL] [MDE]

X02TW002/SB029
Inorganics (ug/L)

ALUMINUM	4300		[PAL]	[ORNLTAP] [MCL] [MDE]
ARSENIC	2.2	K	[PAL]	[ORNLTAP]
COBALT	3.1	J	[PAL]	[ORNLTAP]
IRON	5300	J	[PAL]	[ORNLTAP] [MCL] [MDE]
MANGANESE	51.0		[PAL]	[MCL] [MDE]
VANADIUM	10.0		[PAL]	[MDE]

Inorganics, Filtered (ug/L)

ALUMINUM	63	J	[PAL]	[MCL] [MDE]
ARSENIC	1.2	J	[PAL]	[ORNLTAP]
COBALT	3	J	[PAL]	[ORNLTAP]
IRON	3600		[PAL]	[ORNLTAP] [MCL] [MDE]

X02TW001/SB032
Inorganics (ug/L)

ALUMINUM	200	J	[PAL]	[MCL] [MDE]
IRON	720	J	[PAL]	[MCL] [MDE]

25MW03
Inorganics (ug/L)

ALUMINUM	60.0	J	[PAL]	[MCL] [MDE]

Legend

- Monitoring Well
- Installation Boundary
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

200 100 0 200
Feet

DRAWN BY	DATE
K. MOORE	6/14/10
CHECKED BY	DATE
E. BERKLITE	6/29/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

AREA 8 (UXO-2)
GROUNDWATER METALS EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
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APPROVED BY	DATE
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FIGURE NO.	REV
FIGURE 5-6	0

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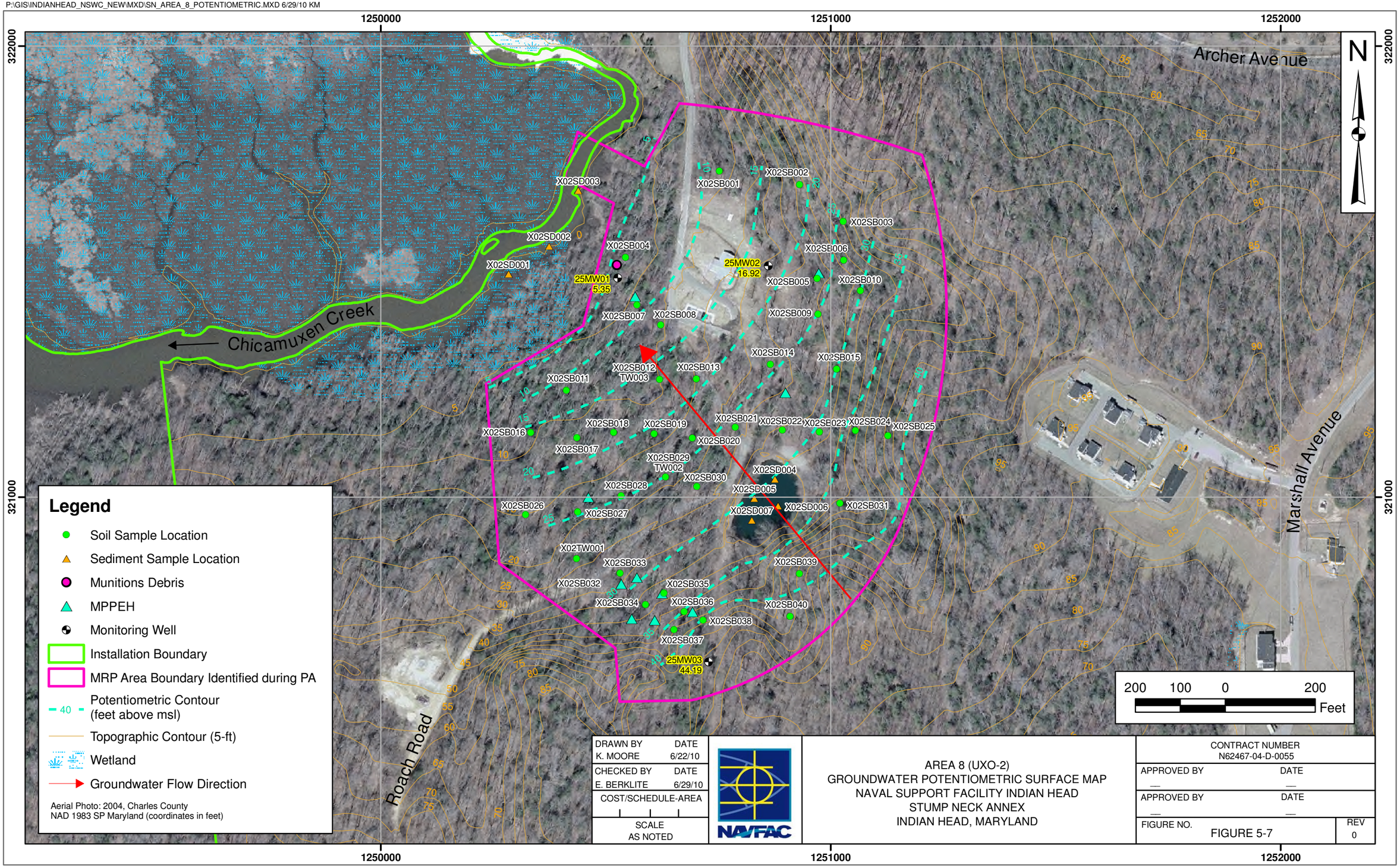

DRAWN BY	DATE
K. MOORE	6/22/10
CHECKED BY	DATE
E. BERKLITE	6/29/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

AREA 8 (UXO-2)
GROUNDWATER POTENTIOMETRIC SURFACE MAP
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
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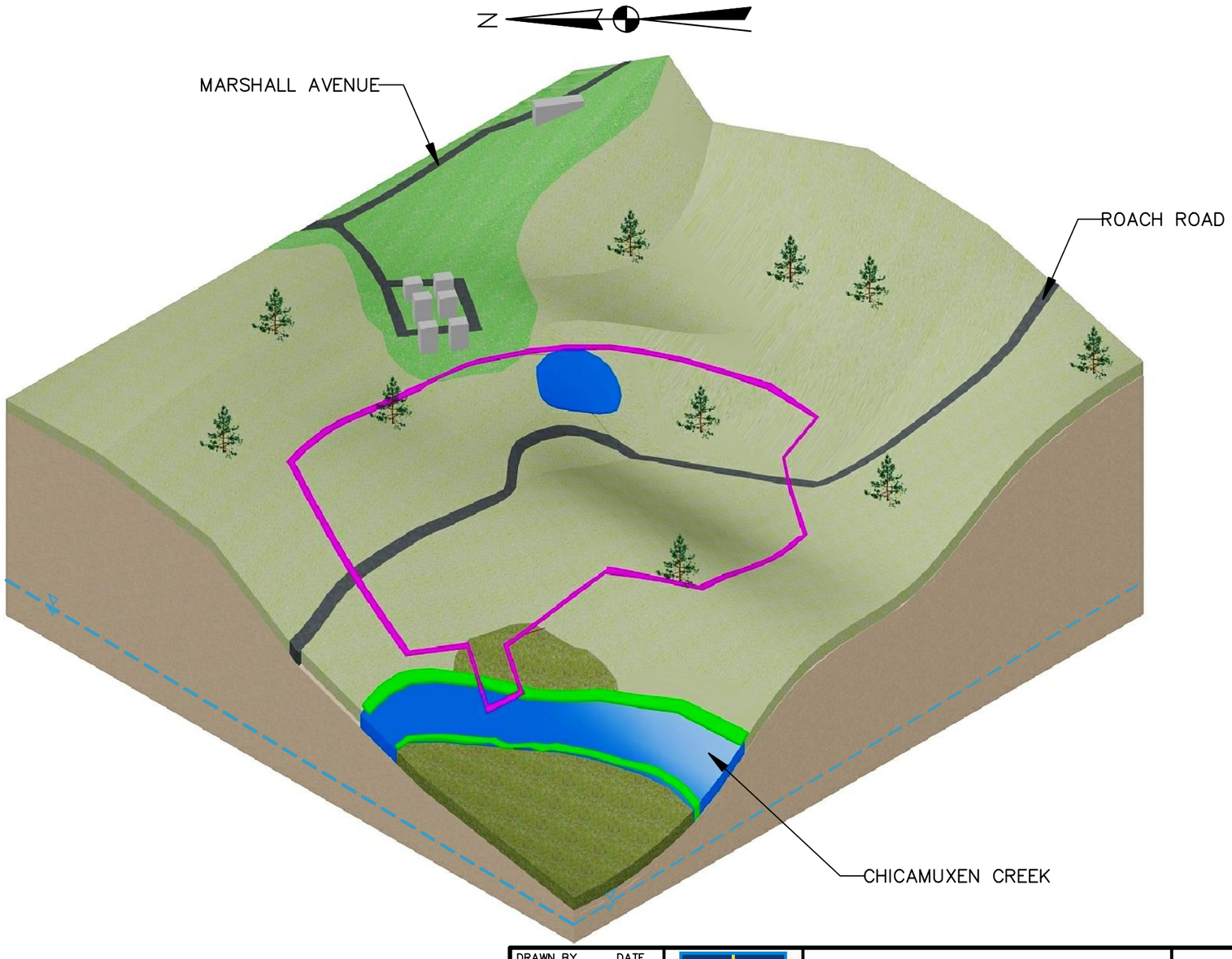
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 5-7	0

LEGEND

- MRP AREA BOUNDARY IDENTIFIED DURING PA
- INSTALLATION BOUNDARY
- WATER TABLE (ESTIMATED)
- BUILDINGS
- TREE
- GRASS
- PAVED ROAD
- FOREST
- WETLANDS



CURRENT AND FUTURE RECEPTORS FOR STUMP NECK IMPACT AREA
HUMAN: –MILITARY/CIVILIAN PERSONNEL –CONTRACTORS –TRESPASSERS
ECOLOGICAL: –PLANTS –INVERTEBRATES –BIRDS –MAMMALS

DRAWN BY ND DATE 6–17–10	NAVFAC	AREA 8 UXO–1 CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND
CHECKED BY DATE		
REVISED BY DATE		
SCALE NOT TO SCALE		

CONTRACT NO. 0810	
OWNER NO.	
APPROVED BY	DATE
DRAWING NO. FIGURE 5–8	REV. 0

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FIGURE 5-9A

MEC EXPOSURE PATHWAY ANALYSIS

AREA 8 UXO 02

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

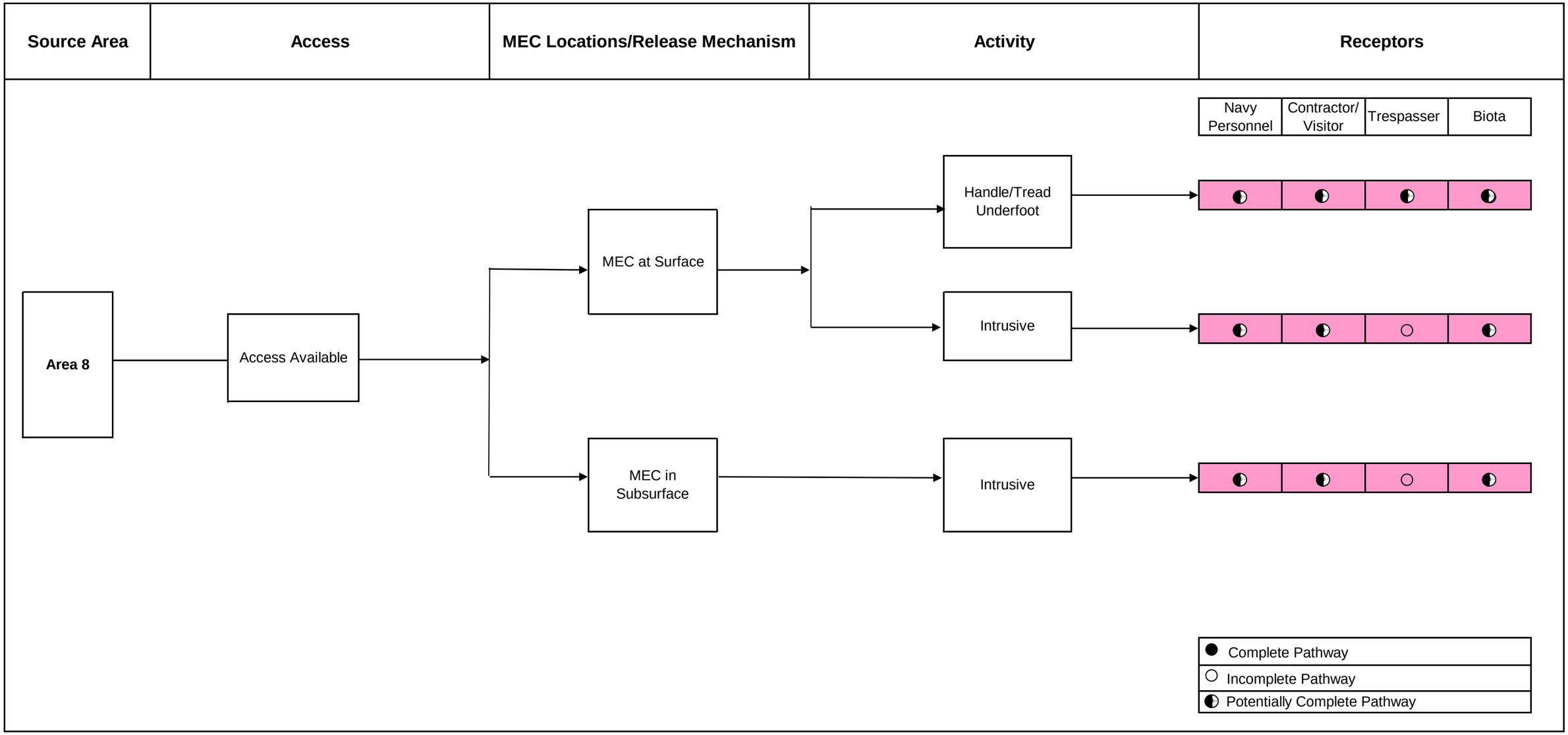
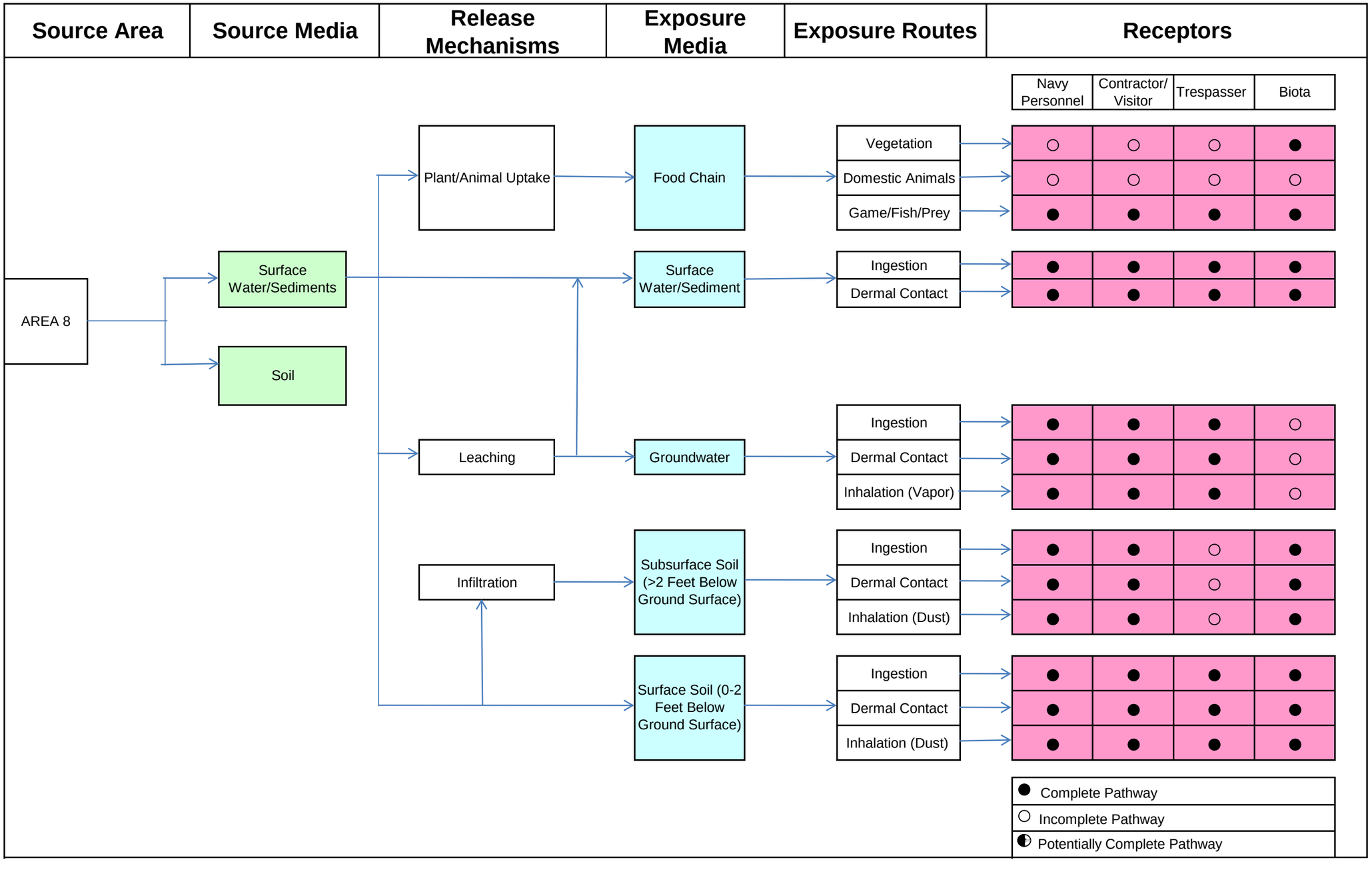


FIGURE 5-9B

MC EXPOSURE PATHWAY ANALYSIS

AREA 8 UXO 02

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



6.0 BASIC IED AREA – UXO 4

6.1 LOCATION AND SETTING

The Basic IED Area is a 3.8-acre range located on the western-central portion of Stump Neck Annex, south of Archer Avenue. The range is accessed by an unnamed dirt road extending from Archer Avenue through the middle of the range and into the southern portion of the range. The range is overgrown with open grassy fields and shrub/wooded areas.

BIED-1. Access Road and Vegetation Across the Basic IED Area

6.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

Building 2087 is the only building remaining at the range. This building was constructed in 1967 and was used for offices. There were additional buildings/structures on range while the Basic IED Area was in use, all of which have been demolished. According to the installation's 2003 Utilities Data Map, there are potable water, sewer, and utility lines to Building 2087 at the Basic IED Area. The electric lines were noted during the 2003 visual survey. Land use at the Basic IED Area included operations and training for Navy personnel from 1957 to the late 1990s. There is no readily available information on the land use

prior to 1957. The Basic IED Area is presently closed and unused by the installation. No future land use changes are planned for the range.

BIED-2. Looking South at Building 2087 Located in the Northern Portion of Basic IED Area

6.3 TOPOGRAPHY

Elevations at the Basic IED Area range from approximately 5 to 30 feet above msl. The topography is flat to gently sloping in the northern portion of the range, and steeply sloping in the south-southeastern portion of the range. The overall topography of the Basic IED Area is downward sloping from northwest to southeast. Erosion is generally most severe in the southern portion of the range where the slopes are the steepest. Downward slopes continue to a wetland located 200 feet south of the range.

6.4 GEOLOGY

Range-specific geology is based on boring and geophysical logs prepared by Brown & Root Environmental during the VI in 1996. The geology at the range consists of silty sand and gravel fill material from approximately 0 to 2 feet bgs; the fill is underlain by silty sand with some clay. The relative amounts of sand, silt, and clay vary across the range. The geology encountered during the SI boring installation was similar with mixtures of sand, silt, and clay. A clay lens was observed at approximately 5 to 7 feet bgs in boring 26SB-03 near the French drain area of former Building 2118. The deepest boring

on range was 22 feet bgs; bedrock was not encountered in this boring. Based on the regional geology of Stump Neck Annex, it is expected that bedrock occurs at approximately 600 to 700 feet below msl. Appendix F.1 includes the boring logs and Appendix F.4 includes the soil and sediment log sheets.

6.5 SOIL AND VEGETATION

According to the Soil Survey of Charles County, soils at the Basic IED Area are classified as Keyport silt loams with 2 to 5 percent slopes over the northern portion and 5 to 12 percent slopes over the southern portion (USDA, 1974). These soils are considered moderately eroded with only a thin layer of surface soil remaining. In some cases the subsoil is exposed. The soils are moderately drained with a high moisture capacity and low permeability. These soils are at risk for severe erosion. Vegetation at the Basic IED Area is characterized by large wooded areas and open grassy areas. The vegetation on the range is illustrated on Figure 6-1. A wetland area is located south of the range.

6.6 HYDROLOGY

There are no surface water bodies within the boundaries of the Basic IED Area. Surface water runoff drains into wetland areas 200 feet south of the site and then into Chicamuxen Creek. Drainage follows the local topography in the south-southeasterly direction.

6.7 BACKGROUND HYDROGEOLOGY

Three monitoring wells were installed at the range during the 1996 VI. These three wells, 26MW01, 26MW02, and 26MW03, have total depths of 15 to 20 feet bgs. Shallow groundwater at the range is typically encountered at 8 to 12 feet bgs. Based on data from slug testing, the groundwater gradient is approximately 0.034, and the average velocity is calculated to be 35 feet per year. The groundwater flow direction is southeasterly across the range. The average hydraulic conductivity of the aquifer is approximately 0.85 feet per day. The hydrogeology discussion for the SI is discussed in Section 6.25.

6.8 WETLANDS

As mentioned above, surface water runoff drains to wetland areas 200 feet south of the site and then into Chicamuxen Creek.

6.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

According to the 1996 Phase I Cultural Resources Survey of Stump Neck Annex, there are no archeological/cultural sites within the Basic IED Area. Several shovel test pits were excavated within the site boundaries, and all were negative for artifacts.

6.10 HISTORICAL INFORMATION

The Basic IED Area consists of approximately 4 acres of large wooded and open grassy fields. It was used from 1957 until approximately 1996 for the testing and demonstration of various explosive devices and chemicals. Munitions used on the range included small arms, bulk high explosives, demolition charges, primers, detonators, fuzes, and squibs. According to the 1996 VI report, 10 pounds of ordnance (net explosive weight) per year were used at the area for approximately 40 years. Also, there were simulated real-life situations in which EOD technicians were required to disarm explosive devices set up within car carcasses, helicopters, and other structures. Fragment-producing devices with TNT were used in such exercises. The entire area has been identified as a suspected MEC site.

According to EOD technicians interviewed about the Basic IED Area, real explosives were not used in the practical exercises with students. Explosives were primarily used for testing or demonstration purposes. Training exercises normally consisted of simulated bombs, on which students would practice disarming. The students were instructed to first x-ray the item and then devise the best approach to render it safe. The only explosive used in these exercises was smokeless powder within 50-caliber rounds that were sometimes used to disarm the devices.

6.11 MUNITIONS USED

The types of munitions used on the range included: small arms, bulk high explosives, explosive D, TNT, demolition charges, primers, detonators, detonation cord, fuzes, and squibs. Mr. Penn, a site representative, recalls that metallic sodium and potassium chlorate, which are explosive and incendiary chemicals, were frequently used at the range. Ammonia nitrol fuel oil, brake fluid, and industrial/household products were also frequently used on the range. Explosives used at the range included: electric and non-electric blasting caps, DETA sheets (a rubber-like explosive), military grade [without nitroglycerine (NG)] and civilian (with NG) dynamite, C-4, C-3, astro-pac (a binary liquid explosive), and military thermite and thermate. Black powder was made on the range using sulfur, charcoal, and salt peter.

6.12 MUNITIONS CONSTITUENTS

The Basic IED Area was used for testing and demonstrating the effects of IEDs, as well as various chemical mixtures. During the demonstrations, small amounts of chemicals or residual waste were discarded on the ground. The following chemical/explosives are known to have been used at the range:

- Sulfuric acid
- Black powder
- Potassium chloride
- Red phosphorous
- Potassium permanganate
- Sodium peroxide
- Sodium chloride
- Hydrogen peroxide
- Gasoline
- Magnesium powder
- Aluminum powder
- Ammonium picrate
- Calcium hypochlorite
- Nitric acid
- Potassium nitrate
- Glycerin
- Ammonium nitrate
- Ferrous oxide
- Iron oxide
- Potassium hypochlorate

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 6-1.

6.13 PREVIOUS INVESTIGATIONS

During the 1996 VI study, groundwater and soil samples were collected to determine the extent of the contamination at four sites of interest at the Basic IED Area: the Incendiary Demonstration Area; Detonation Demonstration Area; French drain system in the vicinity of former Building 2118; and area in

front of the bleachers. These areas and associated sampling locations are presented in the UFP SAP. Soil and groundwater samples were analyzed for VOCs, SVOCs, polychlorinated biphenyls (PCBs), energetics, and inorganics. Over 100 target analytes were evaluated using USEPA national and Region 3 guidelines. No organic compounds were detected in surface or subsurface soil samples collected from the French drain area near Building 2118. Soil samples collected from the Detonation Demonstration Area contained low levels of toluene, carbon disulfide, chloroform, and methylene chloride. At the Incendiary Demonstration Area, chloroform and BEHP were detected in soil samples. Methylene chloride was detected in soil samples from the area in front of the bleachers. Concentrations of organics at each of these areas did not vary significantly with depth. PCBs and energetics were not detected in any of the soil samples at the Basic IED Area.

Several inorganics were detected in soil samples at concentrations at least 2 times greater than in background samples. Silver and arsenic were detected at concentrations five times greater than background levels in the Incendiary Demonstration Area. Ammonium nitrate, TOC, and total petroleum hydrocarbons (TPH) were also detected at levels greater than background in this area. Inorganics were detected at greater concentrations at the downgradient location than the source location. At the Detonation Demonstration Area, calcium and copper were detected at concentrations 10 times background levels, and nickel was detected at concentrations 5 times the background level. In this area, concentrations of inorganics were slightly greater in the source area than the downgradient location. At Building 2118, lead, sodium, and zinc were the only inorganics detected, and they were detected at greater concentrations in the shallow soil samples. Antimony and sodium were the only inorganics detected in the area in front of the bleachers. Ammonia and TPH were also detected in this area at concentrations greater than background levels. VOCs, SVOCs, and energetics were not detected in any of the groundwater samples collected from on range monitoring wells. Metals detected in groundwater included arsenic, barium, calcium, cobalt, iron, magnesium, manganese, and sodium. Only iron and manganese were detected at concentrations greater than 5 times background levels. Concentrations of inorganics detected in Basic IED Area groundwater samples did not exceed federal primary MCLs. Aluminum, iron, and manganese concentrations did exceed federal secondary MCLs. The Basic IED Area is overlapped by the firing fan from the Valley located at the Main Installation. Thus, there is a potential for munitions associated with the Valley to be present at the Basic IED Area. Refer to Section 12.1 for information on the Valley Impact Area.

6.14 MEC SITE FIELDWORK

6.14.1 Background

UXO detector-aided sweeps (100-percent survey coverage) were conducted within a 90- by 150- foot grid through the former detonation area. The PA indicated that the site consists of 3.79 acres (based on historical review), and hence a UXO detector-aided sweep on 50-foot-spaced transects was conducted for the remainder of the site to determine if other suspect metal is present outside the former detonation area.

The initial horizontal boundary for the MEC investigation was defined as the Basic IED Area as presented on Figure 6-1.

The initial vertical boundary for the MEC investigation (detector-aided surface sweeps) was 1 foot bgs within the land area. Explosives were used at this site only on the surface for testing and demonstration purposes. This site is overlapped by the firing fan from the Valley located on the Main Installation; therefore, there is the potential for munitions associated with the Valley to be present in the soil. Data from this investigation were also used in the assessment of impacts from munitions fired from the Valley.

6.14.2 Scope

The scope of survey activities at the Basic IED Area is summarized below (see Figure 6-1).

- Brush cutting as necessary to support the detector-aided surface sweeps as described in Section 3.2.3.

- UXO detector-aided surface sweeps in a 90- by 150-foot grid through the former detonation area covering 100 percent of all accessible areas. Sweeps, at 50-foot spaced transects were conducted for the remainder of the area.

- Consultation with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH IR Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items left in place were avoided during subsequent operations at the site. No MEC items were moved or disturbed during this phase of the project.

6.14.3 Site Preparation

Brush cutting and vegetation removal to support the detector-aided surface sweeps were conducted to the degree necessary to allow the metal detector to get within a few inches of the ground surface. The magnetic detector is approximately 1 inch in diameter and is durable; therefore, it is possible to push the detector through brush and vegetation, as a result, less brush cutting and vegetation removal was required. The all metals detector has a detection head of approximately 8 inches and is more fragile than the magnetometer. Therefore, brush and vegetation were cleared to within a few inches of the ground surface.

6.14.4 UXO Detector-Aided Surface Sweeps

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix E.

Detector-aided surface sweeps of the established survey areas were conducted as shown on Figure 6-1. A 90- by 150-foot grid through the former detonation area was established and received 100-percent coverage. Sweeps at 50-foot spaced transects were conducted for the remainder of the area. A 100 percent detector-aided surface sweep was also conducted of accessible areas within 50 feet of any anomaly clusters identified along transects during detector-aided surface sweeps. The sweeps were conducted by UXO Technicians using hand held metal detectors (Schonstedt or White's). The all metals detector was either used in place of, or in conjunction with, the magnetic locator. The decision as to whether one or both detectors were used was based on the ability to place the sensor of the all metals detector within 1 foot of the ground surface, the relative proportion of ferrous items to non-ferrous items, and the types of items visually observed and their relative potential to be MEC or MPPEH.

Grid nodes were staked in the field using a GPS unit. Stakes were placed at 5-foot intervals on opposite sides (north - south sides) of the grid. In clear areas (minimal tree canopy) stakes were placed every 5 feet on the opposite intervals (east – west) and ropes were stretched from one side to the other to establish 5-foot wide lanes. In heavily vegetated areas, where stretching of ropes was not feasible, technicians walked side-by-side at 5–foot intervals. The general UXO detector aided survey was conducted as described in Section 3a.3. Locations where suspect MEC, MPPEH, MD or subsurface anomalies were observed were marked with a stake. Pictures were taken of items observed on the surface. In clear areas, the locations were recorded using a GPS. In areas where tree canopy precluded

use of a GPS, locations were established using a tape measure and compass measurements from a known location(s). All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures. The MEC hazard assessment methodology is described in Section 3a.5. MEC documentation is described in Section 3a.7.

6.15 DEVIATIONS FROM WORK PLAN

There were numerous subsurface anomalies, therefore the area was expanded by two additional transects. On January 25, 2010, the site manager approved the addition of transects 9 and 10 because of the numerous MD items located on transects 7 and 8.

6.16 MEC SURVEY RESULTS

The Basic IED Area survey was completed January 23, 2010. The Field Forms are included in Appendix C, which also includes the UXO Surface Survey activities from the daily and weekly logs at Basic IED Area:

On January 12, 2010, the UXO Team brush cut transects on the 100 percent coverage section in the Basic IED Area.

On January 11 through 27, 2010, the UXO Team marked and swept the Basic IED Area using Schonstedt GA-52Cx and White's XLT. On January 27, 2010, the area was completed. A total of 0 MEC, and 24 MD items were located in the Basic IED Area. Numerous subsurface anomalies and surface debris were noted. The surface debris was scattered throughout the Basic IED Area and east of the MRS boundary.

Table ES-2 summarizes the MEC investigation of the Basic IED Area. The 24 MD items discovered on the surface are shown in the spreadsheet in Appendix D. There were numerous subsurface anomalies. The area was expanded by two additional transects. Figure 6-2 illustrates the Basic IED Area MEC Finds Locations and Table 6-2 describes the MEC finds. A typical munitions debris is shown below.

6.17 MC SAMPLING PROGRAM

Information from the detector-aided surface sweep on the presence of MD and shallow subsurface anomalies was utilized to identify surface and subsurface MC soil sampling locations, to determine if contamination exists. Tetra Tech consulted with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate UFP SAP). A total of 80 soil samples were collected at 20 soil sampling locations and 3 groundwater samples were collected at three permanent monitoring well locations at the Basic IED Area. Table 6-3 lists the soil sampling locations and the justifications for selecting them.

If no suspect MEC, MPPEH, or subsurface anomaly clusters were observed, the samples were collected at the UFP SAP proposed locations. Figure 6-3 illustrates the sampling locations in conjunction with the MEC detector-aided surface sweep findings at the Basic IED Area. All soil samples were collected via hand auger and DPT and submitted to the fixed-base laboratory for explosives, metals, and VOCs

analyses. Three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis.

The CSM (detailed in Appendix B of Volume I of the UFP SAP) indicated that potentially complete exposure pathways existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist. The updated CSM is included in Section 6.26.

6.17.1 MC Sample Collection and Analysis

Soil sample locations were selected based on a bias towards areas that were believed to be most likely contaminated by past operations at the site. The total area of the site is 3.8 acres as indicated in Table ES-1. See Figure 6-3 for all sample locations. Prior to initiating sample collection, all sample locations were marked by colored pin flags bearing the sample location ID number. Collected sample locations identified in the approved UFP SAP were located by GPS and by measurements from stationary objects (e.g., roadways, existing buildings). All sample locations were collected as proposed in the approved UFP SAP.

1) **Surface Soil**

a) Forty composite surface soil samples (7 aliquots each) were collected from two depths (0 to 6 and 0 to 24 inches bgs) at each of the 20 sample locations. The 0- to 6-inch bgs interval is of interest for ecological risk screening while the 0- to 24-inch bgs interval is of interest for the human health risk screening. Surface soil samples at each location sampled were composites of seven discrete samples collected using the seven-point wheel approach. Explosives present on the surface would have resulted from low order detonations which released particles of explosives. These particles would be heterogeneously distributed in surface soil. In order to form a composite in which explosives would be evenly dispersed, the entire composite was processed in the laboratory using the methodology described in Appendix A of SW-846 Method 8330B. This methodology consisted of air drying and sieving the entire sample and conducting particle size reduction (grinding) of the entire sample. All soil samples were screened with a photoionization detector (PID) using methods described in SOP-20, Calibration and Use of Photoionization Detector as described in Appendix d of the UFP SAP. Surface soil samples were also analyzed for metals using SW 846 Method 6010B/6020A and VOCs using SW 846 Method 8260B.

b) Surface samples were collected via hand auger.

2) **Subsurface Soil**

a) Forty discrete subsurface soil samples were collected at the 20 soil sample locations. Subsurface soil samples were collected at depths of 2 to 4 and 4 to 6 feet bgs. All soil samples were screened with a photoionization detector (PID) using methods described in SOP-20, Calibration and Use of Photoionization Detector as described in Appendix d of the UFP SAP. All subsurface soil samples were analyzed for explosives (SW 846 Method 8330B), metals (SW 846 Method 6010B/6020A), and VOCs using SW 846 Method 8260B.

b) Subsurface soils were collected via DPT.

3) **Groundwater**

a) Three groundwater samples were collected from three existing monitoring wells at the Basic IED Area. Groundwater samples were analyzed for explosives (SW 846 Method 8330B), metals (SW 846 Method 6010B/6020A), and VOCs using SW 846 Method 8260B. The groundwater samples were filtered through a 0.45-micron filter if low-flow sample collection did not result in turbidity of less than 10 NTUs to obtain data on dissolved metals.

4) Duplicates - Two duplicate surface samples, two duplicate subsurface samples, and one duplicate groundwater sample were collected.

Anomaly avoidance techniques were practiced during all sampling operations. Soil sample log sheets are included in Appendix F of this document.

6.18 WORK PLAN DEVIATIONS

There were no work plan deviations.

6.19 SITE INSPECTION DATA COLLECTION RESULTS

6.19.1 MC Sampling Results

All soil samples collected were compared to the PALs and background sampling results, and a statistical evaluation was done to compare the background data with the site sampling results. The summary tables of the site background screening and PALs are presented in Appendix H and the MC analytical results

are also presented in Appendix H. The data validation reports are presented in Appendix I. The statistical summary and calculations are presented in Appendix J. Table 6-4 summarizes the results as compared to the calculated screening values for metals, explosives, and VOCs in surface soil. Table 6-5 summarizes the results as compared to the calculated screening values for metals, explosives, and VOCs in subsurface soil. Table 6-6 summarizes the results as compared to the calculated screening values for metals, explosives, and VOCs in groundwater. The PAL was the reference limit, unless the background and screening calculations exceeded this value. In Tables 6-4 through 6-6, if a parameter had an exceedance of the PAL and background screening values at any sampling point, the parameter is highlighted; individual sample exceedances are also highlighted.

6.20 DATA PRESENTATION/DATA USABILITY

6.20.1 Data Quality Review of Samples at the Basic IED Area

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for the Basic IED Area were of acceptable quality for use in decision-making. The review began with data validation, which is a comparison of DQIs against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as “U,” “J,” “R,” “L,” “K,” or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the DQOs of the project. The DQOs presented in the Munitions Response Program Site Inspections at Ten Munitions Response Program Ranges QAPP (September 2009) were maintained through the course of the sampling event. The Worksheets #19 and #15 of the QAPP present the analytical methods and compounds analyzed.

Table 3 in Appendix I presents all the qualified data and the reason for the data qualification. The rejection of data was not necessary for samples collected at the Basic IED Area and all data are considered valid for their intended purpose.

The sample collection and laboratory analytical completeness were 100 percent.

The laboratory quantitation limit (LQL) exceeded the PAL for nitroglycerin, benzene, chloroform, methylene chloride, and arsenic in aqueous samples. For comparison to risk screening criteria for COPC selection, one half the laboratory QL was used.

There were no quality control deficiencies noted for field accuracy.

Twenty antimony results were qualified because of a laboratory duplicate precision noncompliance. Several samples of aluminum, barium, chromium, cobalt, iron, lead, magnesium, manganese, potassium, sodium, and strontium were qualified because of field duplicate precision noncompliance. Benzene and toluene were qualified because of field duplicate precision in one aqueous duplicate pair. Overall, the field and laboratory precision was acceptable and no data were rejected.

No comparability issues were noted during the data validation process.

Based on field logs indicating the conditions during sample collection and laboratory audits, all reported data are adequately representative of site conditions and intended populations.

6.21 DATA COMPARISON TO PROJECT ACTION LIMITS

Forty composite surface soil samples (0 to 6 inch and 0 to 24 inch bgs), forty discrete subsurface (2 to 4 feet and 4 to 6 feet bgs) soil samples, and three groundwater samples were sent to the FBL for explosives (SW 846 Method 8330B), metals (SW 846 Method 6010B/6020A), and VOCs analysis using SW 846 Method 8260B. No surface or subsurface soil samples screened with the PID had readings above zero parts per million (ppm).

6.21.1 Surface Soil

Table 6-4 summarizes the results as compared to the calculated screening values for explosives, metals, and VOCs in surface soil. Figure 6-4 illustrates the locations of the surface soil exceedances.

The PAL was not exceeded for any explosive constituents. Nitroglycerin had three low- level detections. No other explosives were detected in the composite surface soil samples.

The PAL was exceeded for one VOC constituent. Benzene exceeded the PAL of 1.9 µg/kg (background 95 percent UTL value was NA) at five surface soil sampling locations ranging from 2 µg/kg to 13.5 µg/kg. No other VOCs were exceeded in the composite surface soil samples.

The PAL and background 95 percent UTL values were exceeded for nine metals constituents:

- Aluminum exceeded the PAL of 7700 mg/kg and background 95 percent UTL value of 19700 mg/kg at five composite surface soil sampling locations, ranging from 19900 mg/kg to 26000 mg/kg.

- Antimony exceeded the PAL of 0.27 mg/kg (background 95 percent UTL value was NA) at two composite surface soil sampling locations: X04SS0010024 at a concentration of 0.45 (B) mg/kg, and X04SS0050024 at a concentration of 0.33 (B) mg/kg.

- Copper exceeded the PAL of 28 mg/kg and background 95 percent UTL value of 20.3 mg/kg at seven composite surface soil sampling locations, ranging from 28.4 mg/kg to 89 mg/kg.

- Lead exceeded the PAL of 11 mg/kg and background 95 percent UTL value of 62.5 mg/kg at four composite surface soil sampling locations, ranging from 85.7 mg/kg to 122 mg/kg.

- Lithium exceeded the PAL of 2 mg/kg (background 95 percent UTL value was NA) at all 40 composite surface soil sampling locations, ranging from 4.4 mg/kg to 28.3 mg/kg.

- Mercury exceeded the PAL of 0.058 mg/kg and background 95 percent UTL value of 0.16 mg/kg at two composite surface soil sampling locations: X04SS0190006 at an estimated concentration of 0.57 mg/kg, and X04SS0190024 at an estimated concentration of 0.52 mg/kg.

- Nickel exceeded the PAL of 38 mg/kg and background 95 percent UTL value of 15.4 mg/kg at two composite surface soil sampling locations: X04SS0190006 at a concentration of 63.6 mg/kg, and X04SS0190024 at a concentration of 84.4 mg/kg.

- Tin exceeded the PAL of 0.89 mg/kg (background 95 percent UTL value was NA) at two composite surface soil sampling locations: X04SS0090024 at an estimated concentration of 1.1 mg/kg, and X04SS0100024 at an estimated concentration of 1.7 mg/kg.

- Zinc exceeded the PAL of 46 mg/kg and background 95 percent UTL value of 37.5 mg/kg at 12 composite surface soil sampling locations, ranging from 47.7 mg/kg to 239 mg/kg.

6.21.2 Subsurface Soil

Table 6-5 summarizes the results as compared to the calculated screening values for explosives, metals, and VOCs in subsurface soil. Figure 6-5 illustrates the locations of the subsurface soil exceedances.

Explosives were not detected at any discrete subsurface soil sampling locations.

The PAL was exceeded for one VOC constituent. Benzene exceeded the PAL of 1.9 µg/kg (background 95 percent UTL value was NA) at seven subsurface soil sampling locations ranging from 2.2 mg/kg to 14 mg/kg. No other VOCs were exceeded in the discrete subsurface soil samples.

The PAL and background 95 percent UTL values were exceeded for two metals constituents:

- Lithium exceeded the PAL of 2 mg/kg (background 95 percent UTL value was NA) at all forty discrete subsurface soil sampling locations, ranging from a concentration of 9 mg/kg, to a concentration of 31.6 mg/kg.

- Zinc exceeded the PAL of 46 mg/kg and background 95 percent UTL value of 70.4 mg/kg at four discrete subsurface soil sampling locations, ranging from 71.4 mg/kg to 80.5 mg/kg.

6.21.3 Groundwater

Table 6-6 summarizes the results as compared to the calculated screening values for explosives, VOCs and metals in groundwater. Figure 6-6 illustrates the locations of the groundwater exceedances.

The PALs for explosives were not exceeded in groundwater. X04GW003 had a detection of 2,4,6-trinitrotoluene at a concentration of 0.095 J µg/L. There were no other detections of explosives in groundwater.

There were no VOCs detected in groundwater.

The PALs for groundwater (there were no background 95 percent UTL values) were exceeded for six unfiltered metals constituents and two filtered metals constituents:

Unfiltered metals:

- Aluminum exceeded the PAL of 50 µg/L at all three groundwater sampling locations: X04GW001 at an estimated concentration of 180 µg/L, X04GW002 at an estimated concentration of 68 µg/L, and X04GW003 at an estimated concentration of 1900 µg/L.

- Arsenic exceeded the PAL of 0.045 µg/L at one groundwater sampling location: X04GW001 at an estimated concentration of 1.3 µg/L.

- Cobalt exceeded the PAL of 1.1 µg/L at all three groundwater sampling locations: X04GW001 at an estimated concentration of 22 µg/L, X04GW002 at an estimated concentration of 4.3 µg/L, and X04GW003 at an estimated concentration of 5.9 µg/L.

- Iron exceeded the PAL of 300 µg/L at two of the three groundwater sampling locations: X04GW002 at an estimated concentration of 1087 µg/L, and X04GW003 at an estimated concentration of 1500 µg/L.

- Manganese exceeded the PAL of 50 µg/L at two groundwater sampling locations: X04GW001 at an estimated concentration of 200 µg/L, X04GW002 at an estimated concentration of 110 µg/L.

- Vanadium exceeded the PAL of 3.7 µg/L at two groundwater sampling locations: X04GW002 at a concentration of 4.6 µg/L, and X04GW003 at an estimated concentration of 4.4 µg/L.

Filtered metals:

- Aluminum exceeded the PAL of 50 µg/L at one groundwater sampling location: X04GW003 at an estimated concentration of 78 µg/L.

- Cobalt exceeded the PAL of 1.1 µg/L at one groundwater sampling location: X04GW003 at a concentration of 5.8 µg/L.

Three soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

Statistical calculations were performed to evaluate the EPCs as discussed in Section 6.22 and included in Appendix J. These calculations were used to aid in the Human Health Risk Screening, which is included as Section 6.23. The Ecological Screening is included as Section 6.24.

6.21.4 CED, pH, and TOC

One representative soil sample per sampling depth (0 to 2 feet, 2 to 4 feet, and 4 to 6 feet) was shipped to the FBL for CEC, pH, and TOC analyses. CEC was detected at 68.9 mEq/100 at X04SS0080024,

36.4 mEq/100 at X04SB0080204, and 37.5 mEq/100 at X04SB0080406. PH was detected at 4.04 S.U. at X04SS0080024, 5.03 S.U. at X04SB0080204, and 4.61 S.U. at X04SB0080406. TOC was detected at 15,800 mg/kg at X04SS0080024, 777 mg/kg at X04SB0080204 and 585 mg/kg at X04SB0080406. There are no PALs for CEC or pH. The surface background TOC is 57,200 mg/kg and the subsurface background TOC is 66,500 mg/kg. Neither value was exceeded. The mobility of metals is influenced by pH and CEC. CEC is a calculated value that is an estimate of the ability of the soil to attract, retain, and exchange cations. Soils with CEC above 10 mEq have a higher clay content and a lower sand content with many positions to hold cations. In general, metal cations are most mobile under acidic conditions, and a pH of 7 is neutral. The pH level in this sample would be considered acidic. The mobility of metals generally increases with decreasing soil pH and CEC. TOC is a measure of the total amount of nonvolatile, volatile, partially volatile, and particulate organic compounds in a sample.

6.22 STATISTICAL EVALUATION

A 95 percent UCL is the upper bound of the associated confidence interval on the mean. Exposure assessment and cleanup decisions in support of U.S. EPA projects are often made based upon the mean concentrations of the contaminants of potential concern. A 95 percent *UCL* of the unknown population arithmetic mean is often used to estimate the EPC term (EPA 1992; EPA 2002). It is, therefore, important to compute a reliable, conservative, and stable 95 percent *UCL* of the population mean using the available data. There are several methods for calculating 95 percent UCLs depending on the data distribution that can be used to model the sample data and the amount of censoring that is present (percent of non-detected concentrations). For chemicals with maximum concentrations greater than the PAL or 95 percent background UTL, PRO UCL version 4.00.04 was used to calculate the appropriate UCL. Then the UCL was compared to the PAL. If the UCL was less than the PAL, it was determined that the chemical would not pose a risk. If the UCL was greater than the PAL, then it was determined that further evaluations should be conducted. The following values were calculated for UXO-4 surface and subsurface soil.

Parameter	PAL (mg/kg)	Background	Maximum Concentration	EPC (mg/kg)
UXO 4 SURFACE				
ALUMINUM	7700	19700	**26000**	**19947**
ANTIMONY	0.27	NA	0.099	0.049
COPPER	28	20.3	**89**	**29.1**
LEAD	11	62.5	**122**	35.6
LITHIUM	2	NA	**28.3**	**17.4**
MERCURY	0.058	0.16	**0.57**	0.152

Parameter	PAL (mg/kg)	Background	Maximum Concentration	EPC (mg/kg)
NICKEL	38	15.4	**84.4**	**21.3**
TIN	0.89	NA	**1.7**	NA[(2)]
ZINC	46	37.5	**239**	**65.7**
TOTAL SOLIDS	NA	79.2	**83.3**	79.2
BENZENE	0.0019	NA	**0.135**	**0.002**
UXO 4 SUBSURFACE				
LITHIUM	2	NA	**31.6**	**20.7**
ZINC	46	70.4	**80.5**	42.4
BENZENE	0.019	NA	**0.14**	0.032

Bolded cells indicate that the UCL exceeds the PAL and the background concentration.

6.23 HUMAN HEALTH RISK SCREENING EVALUATION

Forty surface soil samples and forty subsurface soil samples were collected at UXO-4 and analyzed for VOCs, explosives, and inorganics. Three VOCs, one explosive, and 24 inorganics were detected in the surface soil samples collected at UXO-4. Two VOCs and 21 inorganics were detected in the subsurface soil samples at UXO-4. A comparison of the detected soil concentrations to screening levels for surface soil and subsurface soil are presented in Tables 6-4 and 6-5, respectively. Aluminum and lithium were the only chemicals detected at concentrations exceeding the direct contact human health screening levels in surface soil. Lithium was the only chemical detected at concentrations exceeding the direct contact human health screening levels in subsurface soil.

HIs were estimated as shown in Appendix K, Tables 6-6 through 6-9. Carcinogenic toxicity criteria are not available for aluminum and lithium; consequently, ILCRs could not be estimated. The HIs for residential (HI = 0.4) and industrial (HI = 0.03) exposures to surface soil are less than the acceptable level of 1, indicating that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions. HIs for residential (HI = 0.1) and industrial (HI = 0.01) exposures to subsurface soil are also less than the acceptable level of 1.

6.24 ECOLOGICAL RISK SCREENING EVALUTION

6.24.1 COPC Selection

Maximum chemical concentrations in surface soil were compared to the 95 percent UTL background concentration for NSF Indian Head (if available), and ecological screening levels for soil invertebrates,

terrestrial plants, birds, and mammals. Chemicals were selected as COPCs for soil invertebrates or plants if the maximum concentration exceeded both the background concentration (if available) and the screening level, or if a screening level was not available for that receptor. The screening levels are provided in Appendix L, Background and Calculaitons. Frequency of detection tables (fod) are also included in Appendix L.

Appendix L, Table 6-1 also presents the chemicals selected for food chain modeling. Food chain modeling was conducted if the maximum detected concentration for a chemical exceeded the avian or mammal screening level. Food chain modeling was not conducted for chemicals without avian or mammal screening levels, unless the chemical is considered an important bioaccumulative chemical (USEPA, 2006), or for chemicals detected at a maximum concentration less than the 95 percent UTL background concentration for NSF-IH (if available).

COPCs for Terrestrial Invertebrates and Plants

Appendix L, Table 6-2 presents the results of the initial COPC selection for soil invertebrates and plants from surface soil at UXO-4. This table also presents the chemicals that were retained for food chain modeling for mammals and birds (discussed below).

Soil Invertebrates

One explosive (nitroglycerin) was initially retained as a COPC for soil invertebrates because a screening level was not available. Four inorganics (aluminum, copper, lithium, and zinc) were initially retained as COPCs for soil invertebrates because the maximum concentration exceeded the screening level or a screening level was not available.

Terrestrial Plants

One explosive (nitroglycerin) was initially retained as a COPC for terrestrial plants because a screening level was not available. Five inorganics (aluminum, copper, lithium, nickel, and zinc) were initially retained as COPCs for soil invertebrates because the maximum concentration exceeded the screening level.

COPCs for Terrestrial Wildlife

Appendix L, Table 6-2 summarizes the results of the conservative food chain modeling for terrestrial receptors, which uses very conservative exposure assumptions. Appendix K presents the calculation worksheets.

Appendix L, Table 6-2 lists chemicals selected for food chain modeling. Appendix K, Table 6-2 summarizes EEQs for the conservative food chain model. Appendix K also contains spreadsheets with EEQ calculations for each receptor. A chemical was initially retained as a COPC if the calculated NOAEL EEQ was greater than 1.0 for any receptor. Four metals were initially retained as COPCs for wildlife: copper, lead, mercury, and zinc.

6.24.2 Step 3A Refinement

This section presents the Step 3A refinement for chemicals that were selected as COPCs in the screening step.

Soil Invertebrates and Terrestrial Plants

Nitroglycerin was retained as a COPC for soil invertebrates and terrestrial plants because a screening level was not available for this explosive constituent. Alternate benchmarks are not available for nitroglycerin for either receptor and are discussed qualitatively. Nitroglycerin was detected in only 1 of 20 samples collected at the 0 to 6 inches ecological interval of interest, at a relatively low maximum concentration of 0.43 mg/kg. Therefore, one nitroglycerin detection is not expected to impact plants or soil invertebrates.

Aluminum was retained as a COPC for soil invertebrates and terrestrial plants because the average pH measured in UXO-4 surface soil (4.54) is less than the screening pH of less than 5.5. The maximum detected concentration of aluminum is 26,000 mg/kg with an average UXO-4 concentration of 15,743 mg/kg. The maximum is slightly greater than background, and the average concentration is less than the background concentration. Aluminum and iron are typically not bioavailable in surface soils. Additionally, the concentrations of these metals are not likely related to site activities. Therefore, aluminum is not retained as a COPC for soil invertebrates or terrestrial plants.

Copper was retained as a COPC for soil invertebrates and terrestrial plants because the maximum detected concentration (89 mg/kg) slightly exceeded the screening level for both receptors, 80 mg/kg and 70 mg/kg, respectively. Only the maximum detected concentration exceeds these screening levels. Therefore, impacts from copper are expected to be minimal for these receptors, and copper is not retained as a COPC for soil invertebrates or terrestrial plants.

Lithium was retained as a COPC for plants because the maximum detected concentration exceeded the screening level of 2 mg/kg. Screening criteria or alternate benchmarks are not available for soil invertebrates. The screening level for plants (Efroymson et al., 1996) is based on an unspecified phytotoxic effect from the addition of a lithium salt which increases toxicity and likely overestimates exposure as compared to naturally occurring lithium. Additionally, lithium is not expected to be site-related, and the detected concentrations are less than the typical nationwide background concentration of 20 mg/kg (Buchman, 2008). Therefore, lithium is not retained as a COPC for soil invertebrates or terrestrial plants.

Nickel was retained as a COPC for terrestrial plants because the maximum detected concentration (84.4mg/kg) exceeded the screening level (38 mg/kg). Only the maximum detected concentration exceeds this screening level. Therefore, impacts from nickel are expected to be minimal, and nickel is not retained as a COPC for terrestrial plants.

Zinc was retained as a COPC for soil invertebrates and terrestrial plants because the maximum detected concentration (239 mg/kg) exceeded the screening level for both receptors, 120 mg/kg and 160 mg/kg, respectively. Only the maximum detected concentration exceeds these screening levels. Therefore, impacts from zinc are expected to be minimal for these receptors, and zinc is not retained as a COPC for soil invertebrates or terrestrial plants.

Mammals and Birds

The EEQs from the terrestrial food chain modeling were greater than 1.0 for copper, lead, mercury, and zinc using maximum chemical concentrations and conservative exposure assumptions. Therefore, as part of the Step 3a refinement, risks for this pathway were recalculated using average chemical concentrations in surface soil and less conservative exposure assumptions (i.e., average ingestion rates, average body weights).

Appendix L, Table 6-3 summarizes the results of the less conservative food chain modeling for terrestrial receptors. Appendix K also presents the calculation worksheets. Appendix L, Table 6-3 only presents the results of the food chain modeling for the chemicals that were evaluated as part of the Step 3A evaluation. Lead had a NOAEL EEQ only slightly greater than 1 for the robin (1.4) and is not expected to pose a significant risk. Therefore, lead is eliminated as a COPC for terrestrial wildlife. Mercury had NOAEL EEQs greater than 1 for the quail (1.1), robin (8.8), and the shrew (1.3). The average mercury concentration in UXO-4 surface soil (0.0874 mg/kg) used for the Step 3A food chain model is significantly less than the representative Indian Head background surface soil concentration of 0.16 mg/kg. This

background concentration would produce a risk to these receptors much greater than the risk from surface soil at UXO-4. Therefore, because the average site concentrations used in the food chain models were less than the background concentration, significant site-related risks to these receptors are not expected. Therefore, mercury is eliminated as a COPC for risks to birds and mammals.

6.24.3 Ecological Risk Screening Summary

Initially, one explosive and four inorganics were retained as COPCs for further evaluation for soil invertebrates; two explosives and five inorganics were retained as COPCs for further evaluation for terrestrial plants; and four metals were retained as COPCs for further evaluation for terrestrial wildlife. After the Step 3A refinement, no chemicals were retained as COPCs for ecological receptors from detected concentrations of chemicals in surface soil at UXO-4.

6.25 SI HYDROGEOLOGY

Three monitoring wells were installed at the range during the 1996 VI. These three wells, 26MW01, 26MW02, and 26MW03, have total depths of 15 to 20 feet bgs. Shallow groundwater at the range was encountered during the SI at approximately 3 to 8 feet bgs. Table 6-7 includes the groundwater measurements collected during the SI. Based on these data, the groundwater gradient is approximately 0.048. The groundwater flow direction is southeasterly across the range towards the wetlands, as shown on a potentiometric groundwater map created from data collected during the SI (Figure 6-7). Appendix F.14 includes the monitoring well inspection sheets.

6.26 UPDATED CONCEPTUAL SITE MODEL

A three-dimensional depiction of the Basic IED Area is provided as Figure 6-8. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil, soil, and sediment. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses. Only MC associated with the Basic IED Area are considered in the CSM exposure pathway analysis.

6.27 EXPOSURE PATHWAY ANALYSES

This general description of the CSM exposure pathway analysis was included in Section 10.4.11 of the UFP SAP: “The following CSM exposure pathways analysis focuses only on the Basic IED Area and does not consider impacts from the Valley firing fan. Historical evidence indicates that MEC may be present at the range; therefore, an Exposure Pathway Analysis for MEC was created (Figure 6-9A). Based on

available information, MEC are considered suspect over the four sites of interest at the Basic IED Area in surface soil." Based on the MEC surface survey, several surface MD items and subsurface anomalies were logged. Therefore, potentially complete pathways exist for human and ecological receptors for MEC in surface soil. This includes receptors for hand/tread underfoot contact and surface intrusive work that may be conducted at the Basic IED Area. These activities include, but are not limited to, excavation, plowing, tilling, construction, and environmental sampling for human receptors. Ecological receptors may come in contact with MEC through burrowing, nesting, or feeding activities that disturb surface soil. Trespassers are anticipated to be exposed via non-intrusive surface soil activities at the range, but it is unlikely they would be exposed to surface soil through intrusive activities. Based on the detections of VOCs, explosives, and metals from the SI investigation, there are also complete pathways for MC as illustrated on the Exposure Pathway Analysis for MC, Figure 6-9B. The primary source medium for exposure is soil. Exposures to surface soil, subsurface soil, and surface water runoff containing MC may present complete exposure pathways for human and ecological receptors. All human and ecological receptors have complete exposure pathways for direct contact with MC in surface soil, which includes dermal contact, ingestion, and inhalation (dust). Although there are no surface water bodies within the Basic IED Area, there is a large wetland area located directly south of the range. Surface water runoff at the Basic IED Area drains into this wetland area. Thus, potentially complete pathways exist for all human and ecological receptors of surface water/sediment in this wetland. The food chain also becomes a potential pathway because hunting is allowed near the Basic IED Area. Human receptors have the potential to accumulate MC from game animals collected at or near the range. Precipitation infiltration may provide for contaminant mobility into the subsurface soil and into the shallow surficial aquifer, which is assumed to be connected to nearby surface water bodies. MC within subsurface soil are only likely to affect Navy personnel and/or contractors on range through intrusive activities such as construction or sampling. It is not anticipated that trespassers would come in contact with subsurface soil. Although confining layers are expected to prevent the migration of MC to the deeper aquifers used for water supplies, complete exposure pathways exist for MC in shallow groundwater for human receptors.

6.28 CONCLUSIONS

The following conclusions can be made concerning the Basic IED area:

- Building 2087 is the only building remaining at the range. According to the installation's 2003 Utilities Data Map, there are potable water, sewer, and utility lines to Building 2087 at the Basic IED Area. The electric lines were noted during the 2003 visual survey. The Basic IED Area is presently closed and unused by the installation. No future land use changes are planned for the range.

- The Basic IED Area was used for demonstration and testing purposes on a variety of explosive devices and chemicals. Munitions used on range included small arms, bulk high explosives, demolition charges, primers, detonators, fuzes, and squibs. The entire area has been identified as a suspected MEC site.

  During the MEC investigations, numerous sub-surface anomalies and surface debris were noted. The surface debris was scattered throughout the Basic IED Area and east of the MRS boundary.

- Forty surface soil samples and forty subsurface soil samples, and three groundwater samples were collected at UXO-4 and analyzed for VOCs, explosives, and inorganics. Three VOCs, one explosive, and 24 inorganics were detected in the surface soil samples collected at UXO-4. Two VOCs and 21 inorganics were detected in the subsurface soil samples at UXO 4. Carcinogenic toxicity criteria are not available for aluminum and lithium, consequently ILCRs could not be estimated. The HIs for residential (HI = 0.4) and industrial (HI = 0.03) exposures to surface soil are less than the acceptable level of 1 indicating, that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions. HIs for residential (HI = 0.1) and industrial (HI = 0.01) exposures to subsurface soil are also less than the acceptable level of 1.

- In the initial Ecological Risk screening, one explosive (nitroglycerin) and seven inorganics (aluminum, copper, lead, lithium, mercury, nickel, and zinc) were retained as COPCs to be furthered evaluated. After Step 3A refinement, no chemicals were retained as COPCs for ecological receptors from detected concentrations of chemicals in surface soil or sediment at UXO 4.

- The PALs for groundwater were exceeded for six unfiltered metals constituents (aluminum, arsenic, cobalt, iron, manganese, and vanadium) and two filtered metals constituents (aluminum and cobalt).

- The CSM and Exposure Pathway Analyses indicate that potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses. Currently acceptable levels of human and/or ecological risk exist. Groundwater is not currently used at the site.

6.28.1 Data Gaps

There were no data gaps.

6.29 RECOMMENDATIONS FOR NEXT PHASE

Soil and groundwater samples were collected in the areas of the MEC and MPPEH discovered items and the locations of the subsurface anomalies. A human health and ecological risk screening have concluded than no COPCs were retained for soils. However, there are two metals constituents that exceed the PALs in groundwater after filtration, aluminum and cobalt. Further groundwater investigation is recommended.

MEC

Proceed to an RI. The RI should include:

- Clearance of surface MEC/MPPEH and non-munition debris.
- Subsurface geophysical investigation.
- Investigation of representative subset of subsurface anomaly discovered during the geophysical investigation.

MC

- No further action is recommended, however MC sampling if subsurface MEC/MPPEH are found.

TABLE 6-1

MUNITION TYPES AND CHEMICALS
BASIC IED AREA - UXO 04
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MUNITIONS TYPES USED/STORED AT THE FACILITY	ASSOCIATED CHEMICAL CONSTITUENTS
TNT	2,4,6-trinitrotoluene
electric and non-electric blasting caps, detonation cord	Blackpowder (potassium nitrate, sulphur, charcoal or coal, nitrocellulose)
DETA sheets (a rubber-like explosive)	PETN (pentaerythritol tetranitrate) with nitrocellulose and a binder
military grade (without nitroglycerine [NG]) and civilian (with NG) dynamite	75 percent RDX (Cyclotrimethylenetrinitramine), 15 percent TNT (2,4,6-trinitrotoluene), 5 percent motor oil (w/wo NG)
C-3	Composition C-3 is 77% RDX, 3% tetryl, 4% TNT, 1% NC, 5% MNT (mononitrotoluol), and 10% DNT (dinitrotoluol). The last two compounds, while they are explosives, are oily liquids and plasticize the mixture
C-4	The plasticized form of RDX, composition C-4, contains 91% RDX, 2.1% polyisobutylene, 1.6% motor oil, and 5.3% 2-ethylhexyl sebacate
Explosive D	Ammonium picrate
astro-pac (a binary liquid explosive)	Ammonium nitrate plus a volatile fuel
military thermite and thermate	Powdered aluminum and a metal oxide
military thermate	Powdered aluminum and a metal oxide with the addition sulfur and barium nitrate
Black powder	Made on range using sulfur, charcoal, and salt peter
	Other Chemicals used:
	Sulfuric acid
	Potassium chloride
	Potassium permanganate
	Sodium chloride
	Gasoline
	Brake fluid, nitrol fuel oil
	Aluminum powder
	Nitric acid
	Glycerin
	Iron oxide
	Red phosphorous
	Sodium peroxide
	Hydrogen peroxide
	Magnesium powder
	Calcium hypochlorite
	Potassium nitrate
	Ammonium nitrate
	Ferrous oxide
	Potassium hypochlorate

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 6-2

BASIC IED
MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

FACILITY	Stump Neck Annex of Indian Head MD
SITE NUMBER & NAME	112G00810 MMRP Site Investigation

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition (indicate w/ √ as applicable)			Notifications Completed (indicate w/ √ as applicable)	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YY		
01/21/2010	1420	Basic IED Area	BIEDA T-6-1			X	322213.90	1246065.18	MD collection point	Staged, rocket motor fins and fuze parts			01/21/2010	X	BIEDA T-6-1
01/21/2010	1425	Basic IED Area	BIEDA T-8-2			X	322337.57	1246121.15	M-10 anti-tank mine	Training, rusted, pieces			01/21/2010	X	BIEDA T-8-2
01/21/2010	1431	Basic IED Area	BIEDA T-8-3			X	322280.13	1246161.25	81mm mortar base	Ejection, expended, rusted			01/21/2010	X	BIEDA T-8-3
01/21/2010	1437	Basic IED Area	BIEDA T-7-4			X	322128.63	1246112.67	Fuze, Mechanical Time	Expended, used for .50 cal de-armer training			01/21/2010	X	BIEDA T-7-4
01/21/2010	1443	Basic IED Area	BIEDA T-7-5			X	322304.15	1246112.51	MK-230 depth bomb fuze	Staged, marked “empty”, used for training			01/21/2010	X	BIEDA T-7-5
01/21/2010	1452	Basic IED Area	BIEDA T-7-6			X	322310.62	1246112.36	Bomb fuze cutaway	Staged, used for training			01/21/2010	X	BIEDA T-7-6
01/21/2010	1458	Basic IED Area	BIEDA T-7-7			X	322308.12	1246116.49	Bomb fuze arming stem	Rusted, partial			01/21/2010	X	BIEDA T-7-7
01/21/2010	1503	Basic IED Area	BIEDA T-7-8			X	322322.04	1246098.39	81mm mortar, old style	Staged, marked “inert”, no fuze			01/21/2010	X	BIEDA T-7-8
01/21/2010	1512	Basic IED Area	BIEDA T-7-9			X	322349.63	1246106.96	75mm projectile	Expended, no fuze, rusted			01/21/2010	X	BIEDA T-7-9
01/24/2010	1122	Basic IED Area	BIEDA T-6-10			X	322181.85	1246069.34	Sub-Caliber Aircraft Rocket Motor	Rusted, expended, partially buried			01/24/2010	X	BIEDA T-6-10
01/24/2010	1123	Basic IED Area	BIEDA T-6-11			X	322193.66	1246059.85	Bomb fuze, M-100 series	Rusted, partial			01/24/2010	X	BIEDA T-6-11
01/24/2010	1125	Basic IED Area	BIEDA T-6-12			X	322217.72	1246059.26	Booster cup, fuze	Empty, rusted			01/24/2010	X	BIEDA T-6-12
01/24/2010	1128	Basic IED Area	BIEDA T-6-13			X	322223.76	1246064.73	Booster cup, fuze	Empty, rusted			01/24/2010	X	BIEDA T-6-13
01/24/2010	1133	Basic IED Area	BIEDA T-5-14			X	322299.80	1246001.43	Fuze, dummy, M-9	Rusted, empty			01/24/2010	X	BIEDA T-5-14
01/25/2010	1450	Basic IED Area	BIEDA T-3-15			X	322322.90	1245937.68	Mine, M-3	Expended, rusted			01/25/2010	X	BIEDA T-3-15
01/25/2010	1452	Basic IED Area	BIEDA T-3-16			X	322331.85	1245905.21	Booster cup, fuze	Empty, rusted			01/25/2010	X	BIEDA T-3-16
01/25/2010	1455	Basic IED Area	BIEDA T-2-17			X	322339.75	1245867.63	Mine, M-14	Staged, marked “Inert”			01/25/2010	X	BIEDA T-2-17
01/25/2010	1502	Basic IED Area	BIEDA T-2-18			X	322408.96	1245867.61	Firing device, M-5	Expended, rusted, staged			01/25/2010	X	BIEDA T-2-18
01/25/2010	1507	Basic IED Area	BIEDA T-1-19			X	322429.02	1245811.54	Mine, M-3, w/firing device	Expended, rusted, staged			01/25/2010	X	BIEDA T-1-19
01/25/2010	1515	Basic IED Area	BIEDA T-9-20			X	322318.22	1246207.54	Fuze, landmine, MD	Expended, rusted			01/25/2010	X	BIEDA T-9-20
01/25/2010	1522	Basic IED Area	BIEDA T-10-21			X	322341.65	1246284.40	Projectile, 75mm shrapnel	Empty, fired			01/25/2010	X	BIEDA T-10-21
01/25/2010	1530	Basic IED Area	BIEDA T-10-22			X	322074.58	1246273.04	Firing device, M-1	Expended, rusted			01/25/2010	X	BIEDA T-10-22
01/27/2010	1233	BIEDA 100% area	BIEDA-01			X	321991.44	1246049.68	Firing device, M-142	Staged, expended			01/27/2010	X	BIEDA-01
01/27/2010	1235	BIEDA 100% area	BIEDA-02			X	322089.81	1246097.78	Bomb, 250lb practice	Staged, has had explosive demolition procedures performed			01/27/2010	X	BIEDA-02

TABLE 6-3

MC SAMPLING PROGRAM
BASIC IED AREA - UXO 04
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Sampling Locations	Justification
X04SB001	Check Sampling
X04SB002	Check Sampling
X04SB003	Check Sampling
X04SB004	MPPEH Location
X04SB005	MPPEH Location
X04SB006	MPPEH Location
X04SB007	MPPEH Location
X04SB008	MPPEH Location
X04SB009	MPPEH Location
X04SB010	MPPEH Location
X04SB011	MPPEH Location
X04SB011	MPPEH Clusters
X04SB012	MPPEH Location
X04SB013	MPPEH Location
X04SB014	Check Sampling
X04SB015	MPPEH Clusters
X04SB016	MPPEH Location
X04SB017	MPPEH Location
X04SB018	Check Sampling
X04SB019	Check Sampling
X04SB020	Check Sampling

TABLE 6-4

SURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
PAGE 1 OF 6

	nsample			x04ss00100 X04SS0010006		x04ss00102 X04SS0010024		x04ss00200 X04SS0020006		x04ss00202 X04SS0020024		x04ss00300 X04SS0030006		x04ss00302 X04SS0030024		x04ss00400 X04SS0040006		x04ss00402 X04SS0040024				
	location			X04SB001		X04SB001		X04SB002		X04SB002		X04SB003		X04SB003		X04SB004		X04SB004				
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061				
	sample_coc			X04SS0010006		X04SS0010024		X04SS0020006		X04SS0020024		X04SS0030006		X04SS0030024		X04SS0040006		X04SS0040024				
	gis_date			20100318		20100318		20100318		20100318		20100317		20100317		20100318		20100318				
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM				
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL				
	matrix			SO		SO		SO		SO		SO		SO		SO		SO				
	duplicate																					
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00				
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00				
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT				
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS				
	z			001		003		005		007		009		011		013		015				
cas	x	utl95cv	minorpal	c_001		c_003		c_005		c_007		c_009		c_011		c_013		c_015				
	Explosives (mg/kg)																					
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.24	U	0.23	U	0.23	U	0.24	U	0.23	U	0.23	U	0.24	U			
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.23	U	0.23	U	0.24	U	0.23	U	0.23	U	0.24	U			
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
2691-41-0	HMX	NA	380	0.2	U	0.19	U	0.18	U	0.18	UL	0.19	U	0.19	U	0.18	U	0.2	U			
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	**0.13**	J	1.1	U	1.1	U	1.2	U	1.1	U	1.1	U	1.2	U			
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.1	U	1.1	U	1.2	U	1.1	U	1.1	U	1.2	U			
121-82-4	RDX	NA	5.5	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
479-45-8	TETRYL	NA	24	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.18	U	0.2	U			
	Inorganics (mg/kg)																					
7429-90-5	**ALUMINUM**	19700	7700	**26000 [BKG] [PAL] [ORNL] [MDRES]**		**23600 [BKG] [PAL] [ORNL] [MDRES]**		212		19700 [PAL] [ORNL] [MDRES]		18000 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]		**21700 [BKG] [PAL] [ORNL] [MDRES]**		256				
7440-36-0	**ANTIMONY**	NA	0.27	0.16	UL	**0.45 [PAL] [SSL]**	B	0.16	UL	0.16	UL	0.082	J	0.042	J	0.16	UL	0.16	UL			
7440-38-2	ARSENIC	14.9	0.026	5.1 [PAL] [ORNL] [MDRES] [MDSGW]	K	9.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.7 [PAL] [ORNL] [MDRES] [MDSGW]		3.8 [PAL] [ORNL] [MDRES] [MDSGW]		5 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.3 [PAL] [ORNL] [MDRES] [MDSGW]	K	4.5 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.3 [PAL] [ORNL] [MDRES] [MDSGW]	K			
7440-39-3	BARIUM	80.4	330	76.9		86.8 [BKG]		54		60.5		73.4		79.2		71		82.9 [BKG]				
7440-41-7	BERYLLIUM	1.1	16	0.76	J	0.72	J	0.58	J	0.58	J	0.65	J	0.69	J	0.69	J	0.8	J			
7440-43-9	CADMIUM	2.5	0.36	0.16	U	0.2	J	0.16	U	0.17	J	0.3	J	0.17	J	0.16	U	0.16	U			
7440-70-2	CALCIUM	2060	NA	199		1710		2100 [BKG]		9230 [BKG]		1280		855		199		213				
7440-47-3	CHROMIUM	33.4	26	26.2 [PAL] [SSL]		25.8		20.5		22.5		26.1 [PAL] [SSL]		28.9 [PAL] [SSL]		25.7		26.9 [PAL] [SSL]				
7440-48-4	COBALT	22.3	2.3	16.3 [PAL] [ORNL] [SSL]		12.8 [PAL] [ORNL]		5.3 [PAL] [ORNL]		5.5 [PAL] [ORNL]		6.5 [PAL] [ORNL]		6.6 [PAL] [ORNL]		19.7 [PAL] [ORNL] [SSL]		17.3 [PAL] [ORNL] [SSL]				
7440-50-8	**COPPER**	20.3	28	10.2		11.9		11.6		14.2		13.2		**29 [BKG] [PAL] [SSL]**		10.2		10.5				
7439-89-6	IRON	38500	5500	22200 [PAL] [ORNL] [MDRES]		19600 [PAL] [ORNL] [MDRES]		14600 [PAL] [ORNL] [MDRES]		17200 [PAL] [ORNL] [MDRES]		19900 [PAL] [ORNL] [MDRES]		29300 [PAL] [ORNL] [MDRES]		19100 [PAL] [ORNL] [MDRES]		22300 [PAL] [ORNL] [MDRES]				
7439-92-1	**LEAD**	62.5	11	36.3 [PAL] [SSL]		**122 [BKG] [PAL] [SSL]**		11.9 [PAL] [SSL]		22.9 [PAL] [SSL]		**102 [BKG] [PAL] [SSL]**	K	**94.2 [BKG] [PAL] [SSL]**	K	**85.7 [BKG] [PAL] [SSL]**		40.1 [PAL] [SSL]				
7439-93-2	**LITHIUM**	NA	2	**16.5 [PAL] [ORNL] [OPLNT]**		**15.2 [PAL] [OPLNT]**		**18.1 [PAL] [ORNL] [OPLNT]**		**18.3 [PAL] [ORNL] [OPLNT]**		**18.1 [PAL] [ORNL] [OPLNT]**		**23.7 [PAL] [ORNL] [OPLNT]**		**13.6 [PAL] [OPLNT]**		**17.5 [PAL] [ORNL] [OPLNT]**				
7439-95-4	MAGNESIUM	1620	4400	1370		1460		1680 [BKG]		2280 [BKG]		1670 [BKG]		1620		1110		1450				
7439-96-5	MANGANESE	1390	160	610 [PAL] [ORNL] [MDRES] [SSL]		562 [PAL] [ORNL] [MDRES] [SSL]		72.3		134		297 [PAL] [ORNL] [MDRES] [SSL]		180 [PAL] [MDRES]		842 [PAL] [ORNL] [MDRES] [SSL]		643 [PAL] [ORNL] [MDRES] [SSL]				
7439-97-6	**MERCURY**	0.16	0.058	0.057	J	0.048	J	0.035	UL	0.035	UL	0.10 [PAL] [BTAG]	J	0.066 [PAL] [BTAG]	J	0.063 [PAL] [BTAG]	J	0.065 [PAL] [BTAG]	J			
7440-02-0	**NICKEL**	15.4	38	14.4		14.1		12.1		15.5 [BKG]		18.4 [BKG]		17.8 [BKG]		13		15.2				
7440-09-7	POTASSIUM	1470	NA	1260		1570 [BKG]		1550 [BKG]		1380		1340		2020 [BKG]		1190		1460				
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.16	UL	0.16	U	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	U			
7440-22-4	SILVER	0.84	4.2	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.17	U	0.16	U	0.16	U			
7440-23-5	SODIUM	120	NA	22.9	J	39.8	J	46.6	J	49.8		48.7	J	65.4		23.6	J	28.8	J			
7440-24-6	STRONTIUM	NA	120	5.8		23		10.6		20.9		10.2		9.9		5.3		6.6				
7440-31-5	**TIN**	NA	0.89	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.7	U	1.6	U	1.6	U			
7440-62-2	VANADIUM	53.3	7.8	40.6 [PAL] [ORNL] [MDRES] [SSL]		36.6 [PAL] [MDRES] [SSL]		27.7 [PAL] [MDRES] [SSL]		30.9 [PAL] [MDRES] [SSL]		32.5 [PAL] [MDRES] [SSL]	K	40.8 [PAL] [ORNL] [MDRES] [SSL]	K	39.6 [PAL] [ORNL] [MDRES] [SSL]		42.2 [PAL] [ORNL] [MDRES] [SSL]				
7440-66-6	**ZINC**	37.5	46	40.8 [BKG]		**113 [BKG] [PAL] [SSL]**		38.4 [BKG]		42.8 [BKG]		**239 [BKG] [PAL] [SSL]**		**206 [BKG] [PAL] [SSL]**		38.3 [BKG]		42.5 [BKG]				
	Miscellaneous																					
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																			
TTNUS288	PERCENT MOISTURE (%)	NA	NA	16.7		22.8		17.9		19.8		22.4		21		27.3		23.4				
TTNUS002	PH (s.u.)	8.8	NA																			
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																			
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	**83.3**		77.2		**82.1**		**80.2**		77.6		79		72.7		76.6				
	Volatile Organics (ug/kg)																					
71-43-2	**BENZENE**	NA	1.9	**2 [PAL] [MDSGW]**		2.2	U	0.54	J	1.6	U	1.6	U	1.9	U	1.8	U	1.8	U			
75-15-0	CARBON DISULFIDE	NA	19000	1.9	U	2.2	U	1.5	B	1.6	U	1.6	U	1.9	U	1.8	U	1.8	U			
67-66-3	CHLOROFORM	NA	0.91	1.9	U	2.2	U	1.6	U	1.6	U	1.6	U	1.9	U	1.8	U	1.8	U			
60-29-7	DIETHYL ETHER	NA	NA	1.9	U	2.2	U	1.6	U	1.6	U	1.6	U	1.9	U	1.8	U	1.8	U			
75-09-2	METHYLENE CHLORIDE	NA	19	3.4	B	4.4	B	3.9	B	2.1	B	1.8	B	1.2	B	2.8	B	4.1	B			
108-88-3	TOLUENE	140	100	3.3	J	2.2	U	1.6	U	1.6	U	1.9	B	1.9	U	1.8	U	0.76	J			

TABLE 6-4

SURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			x04ss00500 X04SS0050006			x04ss00502 X04SS0050024			x04ss00600 X04SS0060006			x04ss00602 X04SS0060024			x04ss00700 X04SS0070006			x04ss00702 X04SS0070024			x04ss00703 X04SS0070024-AVG		
	location			X04SB005			X04SB005			X04SB006			X04SB006			X04SB007			X04SB007			X04SB007		
	project_no			00810_2010061			00810_2010061			00810_2010061			00810_2010061			00810_2010061			00810_2010061			00810_2010061		
	sample_coc			X04SS0050006			X04SS0050024			X04SS0060006			X04SS0060024			X04SS0070006			X04SS0070024			X04SS0070024-AVG		
	gis_date			20100318			20100318			20100318			20100318			20100318			20100318			20100318		
	qc_type			NM			NM			NM			NM			NM			NM			NM		
	sacode			NORMAL			NORMAL			NORMAL			NORMAL			NORMAL			ORIG			AVG		
	matrix			SO			SO			SO			SO			SO			SO			SO		
	duplicate																							
	top_depth			0.00			0.00			0.00			0.00			0.00			0.00			0.00		
	bottom_dep			0.50			2.00			0.50			2.00			0.50			2.00			2.00		
	depth_unit			FT			FT			FT			FT			FT			FT			FT		
	submatrix			SS			SS			SS			SS			SS			SS			SS		
	z			017			019			021			023			025			027			028		
cas	x	utl95cv	minorpal	c_017			c_019			c_021			c_023			c_025			c_027			c_028		
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.23	U		0.24	U		0.24	U		0.24	U		0.25	U		0.25	U		0.25	U	
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
88-72-2	2-NITROTOLUENE	0.15	2.9	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
618-87-1	3,5-DINITROANILINE	NA	NA	0.23	U		0.24	U		0.24	U		0.24	U		0.25	U		0.25	U		0.25	U	
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
99-99-0	4-NITROTOLUENE	0.21	30	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
2691-41-0	HMX	NA	380	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	UL	
98-95-3	NITROBENZENE	NA	0.023	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
55-63-0	NITROGLYCERIN	NA	0.61	1.1	U		1.1	U		1.1	U		**0.089**	J		1.2	U		1.2	U		1.2	U	
78-11-5	PETN	NA	NA	1.1	U		1.1	U		1.1	U		1.2	U		1.2	U		1.2	U		1.2	U	
121-82-4	RDX	NA	5.5	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
479-45-8	TETRYL	NA	24	0.19	U		0.19	U		0.19	U		0.19	U		0.2	U		0.2	U		0.2	U	
	Inorganics (mg/kg)																							
7429-90-5	**ALUMINUM**	19700	7700	**21200 [BKG] [PAL] [ORNL] [MDRES]**			**24900 [BKG] [PAL] [ORNL] [MDRES]**			**20600 [BKG] [PAL] [ORNL] [MDRES]**			19400 [PAL] [ORNL] [MDRES]			14700 [PAL] [ORNL] [MDRES]			16300 [PAL] [ORNL] [MDRES]			16500 [PAL] [ORNL] [MDRES]		
7440-36-0	**ANTIMONY**	NA	0.27	0.17	UL		**0.33 [PAL] [SSL]**	B		0.16	UL		0.17	UL		0.13	B		0.18	B		0.17	U	
7440-38-2	ARSENIC	14.9	0.026	4.8 [PAL] [ORNL] [MDRES] [MDSGW]	K		5 [PAL] [ORNL] [MDRES] [MDSGW]	K		5.8 [PAL] [ORNL] [MDRES] [MDSGW]	K		5.9 [PAL] [ORNL] [MDRES] [MDSGW]	K		5.8 [PAL] [ORNL] [MDRES] [MDSGW]	K		5.7 [PAL] [ORNL] [MDRES] [MDSGW]	K		5.1 [PAL] [ORNL] [MDRES] [MDSGW]	K	
7440-39-3	BARIUM	80.4	330	64.5			77.2			57.9			67.9			67.3			60.7			61		
7440-41-7	BERYLLIUM	1.1	16	0.71	J		0.76	J		0.62	J		0.69	J		0.6	J		0.59	J		0.595	J	
7440-43-9	CADMIUM	2.5	0.36	0.17	U		0.16	U		0.16	U		0.16	U		0.16	U		0.16	U		0.16	U	
7440-70-2	CALCIUM	2060	NA	202			280			173			186			227			260			219.5		
7440-47-3	CHROMIUM	33.4	26	28 [PAL] [SSL]			28.6 [PAL] [SSL]			23			24.8			18.7			23.7			22.6		
7440-48-4	COBALT	22.3	2.3	17.6 [PAL] [ORNL] [SSL]			14.4 [PAL] [ORNL] [SSL]			15.2 [PAL] [ORNL] [SSL]			16.8 [PAL] [ORNL] [SSL]			11.2 [PAL] [ORNL]			11.8 [PAL] [ORNL]			11.5 [PAL] [ORNL]		
7440-50-8	**COPPER**	20.3	28	10			11			14			14.5			10.7			10.4			9.55		
7439-89-6	IRON	38500	5500	21600 [PAL] [ORNL] [MDRES]			23900 [PAL] [ORNL] [MDRES]			22600 [PAL] [ORNL] [MDRES]			23800 [PAL] [ORNL] [MDRES]			15300 [PAL] [ORNL] [MDRES]			16500 [PAL] [ORNL] [MDRES]			17050 [PAL] [ORNL] [MDRES]		
7439-92-1	**LEAD**	62.5	11	19.7 [PAL] [SSL]			16.6 [PAL] [SSL]			24.4 [PAL] [SSL]			24.5 [PAL] [SSL]			35.3 [PAL] [SSL]			36.5 [PAL] [SSL]	J		28.35 [PAL] [SSL]	J	
7439-93-2	**LITHIUM**	NA	2	**16.8 [PAL] [ORNL] [OPLNT]**			**21.2 [PAL] [ORNL] [OPLNT]**			**16.9 [PAL] [ORNL] [OPLNT]**			**17.3 [PAL] [ORNL] [OPLNT]**			**12.2 [PAL] [OPLNT]**			**12.4 [PAL] [OPLNT]**			**13.35 [PAL] [OPLNT]**		
7439-95-4	MAGNESIUM	1620	4400	1290			1560			1040			1120			805			816			896.5		
7439-96-5	MANGANESE	1390	160	680 [PAL] [ORNL] [MDRES] [SSL]			503 [PAL] [ORNL] [MDRES] [SSL]			474 [PAL] [ORNL] [MDRES] [SSL]			564 [PAL] [ORNL] [MDRES] [SSL]			605 [PAL] [ORNL] [MDRES] [SSL]			632 [PAL] [ORNL] [MDRES] [SSL]			529 [PAL] [ORNL] [MDRES] [SSL]		
7439-97-6	**MERCURY**	0.16	0.058	0.056	J		0.066 [PAL] [BTAG]	J		0.052	J		0.054	J		0.051	J		0.049	J		0.03325	JL	
7440-02-0	**NICKEL**	15.4	38	13.9			15.4			14.1			15.5 [BKG]			10.7			10.9			10.85		
7440-09-7	POTASSIUM	1470	NA	1370			1810 [BKG]			1340			1370			931			989			1214.5		
7782-49-2	SELENIUM	1.2	0.52	0.17	UL		0.16	UL		0.16	UL		0.17	UL		0.16	UL		0.17	UL		0.165	UL	
7440-22-4	SILVER	0.84	4.2	0.17	U		0.16	U		0.16	U		0.16	U		0.16	U		0.16	U		0.16	U	
7440-23-5	SODIUM	120	NA	26.2	J		43	J		26.2	J		27	J		19.7	J		21.2	J		26.55	J	
7440-24-6	STRONTIUM	NA	120	5.9			8.1			5.7			5.9			7.7			7.9			7.9		
7440-31-5	**TIN**	NA	0.89	1.7	U		1.6	U		1.6	U		1.6	U		1.7	U		1.6	U		1.6	U	
7440-62-2	VANADIUM	53.3	7.8	42.8 [PAL] [ORNL] [MDRES] [SSL]			44.9 [PAL] [ORNL] [MDRES] [SSL]			32.6 [PAL] [MDRES] [SSL]			34.2 [PAL] [MDRES] [SSL]			26.9 [PAL] [MDRES] [SSL]			27.2 [PAL] [MDRES] [SSL]			27.75 [PAL] [MDRES] [SSL]		
7440-66-6	**ZINC**	37.5	46	43.7 [BKG]			44.7 [BKG]			45.5 [BKG]			**47.7 [BKG] [PAL] [SSL]**			**54.1 [BKG] [PAL] [SSL]**			**64.6 [BKG] [PAL] [SSL]**			**57.3 [BKG] [PAL] [SSL]**		
	Miscellaneous																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																					
TTNUS288	PERCENT MOISTURE (%)	NA	NA	22.5			21.1			23			22.2			25.6			17.6			17.6		
TTNUS002	PH (s.u.)	8.8	NA																					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																					
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	77.5			78.9			77			77.8			74.4			**82.4**			**82.4**		
	Volatile Organics (ug/kg)																							
71-43-2	**BENZENE**	NA	1.9	2	U		1.3	U		1.8	U		1.8	U		2.1	U		1.9	UJ		**6.675 [PAL] [MDSGW]**	J	
75-15-0	CARBON DISULFIDE	NA	19000	2	U		1.3	U		1.8	U		1.8	U		2.1	U		1.9	U		1.7	U	
67-66-3	CHLOROFORM	NA	0.91	2	U		1.3	U		1.8	U		1.8	U		2.1	U		1.9	U		1.7	U	
60-29-7	DIETHYL ETHER	NA	NA	2	U		1.3	U		1.8	U		1.8	U		2.1	U		1.9	U		1.7	U	
75-09-2	METHYLENE CHLORIDE	NA	19	4.5	B		3	B		4	B		3.8	B		3.9	B		2.5	B		3	B	
108-88-3	TOLUENE	140	100	2	U		1.3	U		1.8	U		1.8	U		2.1	U		1.9	UJ		64.975	J	

TABLE 6-4

SURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

cas	x	utl95cv	minorpal	c_030		c_033		c_034		c_036		c_039		c_041		c_043	
				x04ss00705		x04ss00800		x04ss00801		x04ss00803		x04ss00806		x04ss00900		x04ss00902	
	nsample			X04SS0070024-D		X04SS0080006		X04SS0080006-AVG		X04SS0080006-D		X04SS0080024		X04SS0090006		X04SS0090024	
	location			X04SB007		X04SB008		X04SB008		X04SB008		X04SB008		X04SB009		X04SB009	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			FD031810-02		X04SS0080006		X04SS0080006-AVG		FD031810-01		X04SS0080024		X04SS0090006		X04SS0090024	
	gis_date			20100318		20100318		20100318		20100318		20100318		20100318		20100318	
	qc_type			FD		NM		NM		FD		NM		NM		NM	
	sacode			DUP		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate			X04SS0070024						X04SS0080006							
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		0.50		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS	
	z			030		033		034		036		039		041		043	
cas	x	utl95cv	minorpal	c_030		c_033		c_034		c_036		c_039		c_041		c_043	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.245	U	0.24	U	0.24	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.245	U	0.24	U	0.24	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	U	0.195	UL	0.19	UL	0.2	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																
7429-90-5	**ALUMINUM**	19700	7700	16700 [PAL] [ORNL] [MDRES]		13800 [PAL] [ORNL] [MDRES]		14600 [PAL] [ORNL] [MDRES]		15400 [PAL] [ORNL] [MDRES]		14800 [PAL] [ORNL] [MDRES]		17600 [PAL] [ORNL] [MDRES]		17000 [PAL] [ORNL] [MDRES]	
7440-36-0	**ANTIMONY**	NA	0.27	0.16	UL	0.054	B	0.107	U	0.16	UL	0.033	UL	0.26	B	0.18	B
7440-38-2	ARSENIC	14.9	0.026	4.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.35 [PAL] [ORNL] [MDRES] [MDSGW]	K	4.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.7 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.1 [PAL] [ORNL] [MDRES] [MDSGW]	K
7440-39-3	BARIUM	80.4	330	61.3		63.5		68.3		73.1		69.3		46.7		54.3	
7440-41-7	BERYLLIUM	1.1	16	0.6	J	0.49	J	0.62	J	0.75	J	0.61		0.48	J	0.48	J
7440-43-9	CADMIUM	2.5	0.36	0.16	U	0.082	U	0.121	U	0.16	U	0.083	U	0.16	U	0.083	U
7440-70-2	CALCIUM	2060	NA	179		375		311		247		313		266		226	
7440-47-3	CHROMIUM	33.4	26	21.5		14.2	J	20.2	J	26.2 [PAL] [SSL]	J	15.5		16.5		15.2	
7440-48-4	COBALT	22.3	2.3	11.2 [PAL] [ORNL]		5.4 [PAL] [ORNL]	J	9.5 [PAL] [ORNL]	J	13.6 [PAL] [ORNL] [SSL]	J	6.2 [PAL] [ORNL]		5.6 [PAL] [ORNL]		6.7 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	8.7		11.1		12		12.9		7.1		16.1		10.9	
7439-89-6	IRON	38500	5500	17600 [PAL] [ORNL] [MDRES]		10300 [PAL] [ORNL] [MDRES]	J	13900 [PAL] [ORNL] [MDRES]	J	17500 [PAL] [ORNL] [MDRES]	J	11200 [PAL] [ORNL] [MDRES]		15500 [PAL] [ORNL] [MDRES]		13300 [PAL] [ORNL] [MDRES]	
7439-92-1	**LEAD**	62.5	11	20.2 [PAL] [SSL]	J	51.3 [PAL] [SSL]		43.5 [PAL] [SSL]		35.7 [PAL] [SSL]		29.5 [PAL] [SSL]		54.9 [PAL] [SSL]		39.1 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	**14.3 [PAL] [OPLNT]**		**10.3 [PAL] [OPLNT]**		**11.7 [PAL] [OPLNT]**		**13.1 [PAL] [OPLNT]**		**11.1 [PAL] [OPLNT]**		**12.4 [PAL] [OPLNT]**		**12.3 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	1620	4400	977		1040		1017.5		995		1210		835		859	
7439-96-5	MANGANESE	1390	160	426 [PAL] [ORNL] [MDRES] [SSL]		195 [PAL] [ORNL] [MDRES]	J	337.5 [PAL] [ORNL] [MDRES] [SSL]	J	480 [PAL] [ORNL] [MDRES] [SSL]	J	154		128		143	
7439-97-6	**MERCURY**	0.16	0.058	0.035	UL	0.045	J	0.059 [PAL] [BTAG]	J	0.073 [PAL] [BTAG]	J	0.027	J	0.059 [PAL] [BTAG]	J	0.042	J
7440-02-0	**NICKEL**	15.4	38	10.8		8.5		11.4		14.3		10.1		13.9		11.9	
7440-09-7	POTASSIUM	1470	NA	1440		932		1061		1190		941		1010		998	
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	0.84	4.2	0.16	U	0.082	U	0.121	U	0.16	U	0.083	U	0.16	U	0.083	U
7440-23-5	SODIUM	120	NA	31.9	J	22.4	J	27.35	J	32.3	J	27.5		21.9	J	23.9	J
7440-24-6	STRONTIUM	NA	120	7.9		6.3		6.3		6.3		6.7		5.8		5.5	
7440-31-5	**TIN**	NA	0.89	1.6	U	0.83	U	1.215	U	1.6	U	0.83	U	1.6	U	**1.1 [PAL] [BTAG]**	J
7440-62-2	VANADIUM	53.3	7.8	28.3 [PAL] [MDRES] [SSL]		22.5 [PAL] [MDRES] [SSL]		29.3 [PAL] [MDRES] [SSL]		36.1 [PAL] [MDRES] [SSL]		23.4 [PAL] [MDRES] [SSL]		31.7 [PAL] [MDRES] [SSL]		26.1 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	**50 [BKG] [PAL] [SSL]**		30.5		39.15 [BKG]		**47.8 [BKG] [PAL] [SSL]**		30.3		39.4 [BKG]		38.1 [BKG]	
	Miscellaneous																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA									43		68.9			
TTNUS288	PERCENT MOISTURE (%)	NA	NA			20		20				19.7		23.3		24.3	
TTNUS002	PH (s.u.)	8.8	NA									5.04		4.04			
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA									2410		15800			
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA			**80**		**80**				**80.3**		76.7		75.7	
	Volatile Organics (ug/kg)																
71-43-2	**BENZENE**	NA	1.9	**12.4 [PAL] [MDSGW]**	J	1.9	U	1.75	U	1.6	U	1.7	U	**13.5 [PAL] [MDSGW]**	L	0.74	U
75-15-0	CARBON DISULFIDE	NA	19000	1.5	U	1.9	U	1.75	U	1.6	U	1.7	U	2.2	U	0.74	U
67-66-3	CHLOROFORM	NA	0.91	1.5	U	1.9	U	1.75	U	1.6	U	1.7	U	2.2	U	0.74	U
60-29-7	DIETHYL ETHER	NA	NA	1.5	U	1.9	U	1.75	U	1.6	U	1.7	U	2.2	U	0.74	U
75-09-2	METHYLENE CHLORIDE	NA	19	3.5	B	5.6	B	4.15	B	2.7	B	3.6	B	2.2	U	1.3	B
108-88-3	TOLUENE	140	100	129 [PAL] [BTAG]	J	1.9	U	1.75	U	1.6	U	1.7	U	0.77	J	0.74	U

TABLE 6-4

SURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			x04ss01000		x04ss01002		x04ss01100		x04ss01102		x04ss01200		x04ss01202		x04ss01300		x04ss01302	
	location			X04SS0100006		X04SS0100024		X04SS0110006		X04SS0110024		X04SS0120006		X04SS0120024		X04SS0130006		X04SS0130024	
	project_no			X04SB010		X04SB010		X04SB011		X04SB011		X04SB012		X04SB012		X04SB013		X04SB013	
	sample_coc			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	gis_date			X04SS0100006		X04SS0100024		X04SS0110006		X04SS0110024		X04SS0120006		X04SS0120024		X04SS0130006		X04SS0130024	
	qc_type			20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317	
	sacode			NM		NM		NM		NM		NM		NM		NM		NM	
	matrix			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	duplicate			SO		SO		SO		SO		SO		SO		SO		SO	
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS	
	z			045		047		049		051		053		055		057		059	
cas	x	utl95cv	minorpal	c_045		c_047		c_049		c_051		c_053		c_055		c_057		c_059	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U		
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U		
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U		
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U		
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U		
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	19700	7700	16700 [PAL] [ORNL] [MDRES]		**20400 [BKG] [PAL] [ORNL] [MDRES]**		11300 [PAL] [ORNL] [MDRES]		12500 [PAL] [ORNL] [MDRES]		16300 [PAL] [ORNL] [MDRES]		17000 [PAL] [ORNL] [MDRES]		12200 [PAL] [ORNL] [MDRES]		18100 [PAL] [ORNL] [MDRES]	
7440-36-0	**ANTIMONY**	NA	0.27	0.099	J	0.033	UJ	0.059	J	0.041	J	0.041	J	0.033	UJ	0.033	UJ	0.033	UJ		
7440-38-2	ARSENIC	14.9	0.026	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.9 [PAL] [ORNL] [MDRES] [MDSGW]	K	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	1.7 [PAL] [ORNL] [MDRES] [MDSGW]	K	4 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	K		
7440-39-3	BARIUM	80.4	330	63.3		75.4		37.9		54.4		58.1		73.6		47.4		43.1			
7440-41-7	BERYLLIUM	1.1	16	0.57	J	0.69	J	0.33	J	0.44	J	0.66	J	0.81	J	0.45	J	0.48	J		
7440-43-9	CADMIUM	2.5	0.36	1.6 [PAL] [SSL]		0.18	J	0.084	J	0.08	U	0.16	U	0.17	U	0.081	U	0.16	U		
7440-70-2	CALCIUM	2060	NA	1980		1140		301		220		287		264		572		323			
7440-47-3	CHROMIUM	33.4	26	22.7		28.8 [PAL] [SSL]		14.1		15.3		23.2		27.8 [PAL] [SSL]		16.5		18.2			
7440-48-4	COBALT	22.3	2.3	6.2 [PAL] [ORNL]		5.7 [PAL] [ORNL]		5 [PAL] [ORNL]		6.6 [PAL] [ORNL]		6.5 [PAL] [ORNL]		7.7 [PAL] [ORNL]		6.2 [PAL] [ORNL]		6.1 [PAL] [ORNL]			
7440-50-8	**COPPER**	20.3	28	13		14.5		7.6		7.3		**44.8 [BKG] [PAL] [SSL]**		**28.4 [BKG] [PAL] [SSL]**		10.7		11.1			
7439-89-6	IRON	38500	5500	17200 [PAL] [ORNL] [MDRES]		30500 [PAL] [ORNL] [MDRES]		9790 [PAL] [ORNL] [MDRES]		10800 [PAL] [ORNL] [MDRES]		20000 [PAL] [ORNL] [MDRES]		20200 [PAL] [ORNL] [MDRES]		13700 [PAL] [ORNL] [MDRES]		16100 [PAL] [ORNL] [MDRES]			
7439-92-1	**LEAD**	62.5	11	29.6 [PAL] [SSL]	K	23.9 [PAL] [SSL]	K	**119 [BKG] [PAL] [SSL]**	K	38.2 [PAL] [SSL]	K	26.5 [PAL] [SSL]	K	21.8 [PAL] [SSL]	K	33.1 [PAL] [SSL]	K	20 [PAL] [SSL]	K		
7439-93-2	**LITHIUM**	NA	2	**20.7 [PAL] [ORNL] [OPLNT]**		**28.3 [PAL] [ORNL] [OPLNT]**		**11.5 [PAL] [OPLNT]**		**13.8 [PAL] [OPLNT]**		**19.6 [PAL] [ORNL] [OPLNT]**		**20.7 [PAL] [ORNL] [OPLNT]**		**14.1 [PAL] [OPLNT]**		**14.9 [PAL] [OPLNT]**			
7439-95-4	MAGNESIUM	1620	4400	1210		1520		702		872		1500		1950 [BKG]		1100		1200			
7439-96-5	MANGANESE	1390	160	144		64		201 [PAL] [ORNL] [MDRES]		161 [PAL] [MDRES]		272 [PAL] [ORNL] [MDRES] [SSL]		198 [PAL] [ORNL] [MDRES]		310 [PAL] [ORNL] [MDRES] [SSL]		210 [PAL] [ORNL] [MDRES]			
7439-97-6	**MERCURY**	0.16	0.058	0.057	J	0.046	J	0.038	J	0.028	J	0.043	J	0.031	J	0.041	J	0.04	J		
7440-02-0	**NICKEL**	15.4	38	20.9 [BKG]		20.8 [BKG]		7.9		9.8		12.9		16 [BKG]		10.8		11.9			
7440-09-7	POTASSIUM	1470	NA	1470		2230 [BKG]		1090		1360		2240 [BKG]		2610 [BKG]		1590 [BKG]		1140			
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL		
7440-22-4	SILVER	0.84	4.2	0.16	U	0.16	U	0.082	U	0.08	U	0.16	U	0.17	U	0.081	U	0.16	U		
7440-23-5	SODIUM	120	NA	54.1		78.9		24.4	J	34.8		54.2		76		36.1		20.9	J		
7440-24-6	STRONTIUM	NA	120	10.8		10.1		5.8		6.9		8.5		10.4		7.1		5.3			
7440-31-5	**TIN**	NA	0.89	1.7	U	**1.7 [PAL] [BTAG]**	J	0.82	U	0.81	U	1.6	U	1.7	U	0.82	U	1.6	U		
7440-62-2	VANADIUM	53.3	7.8	35.2 [PAL] [MDRES] [SSL]	K	43.1 [PAL] [ORNL] [MDRES] [SSL]	K	25.8 [PAL] [MDRES] [SSL]	K	25.3 [PAL] [MDRES] [SSL]	K	37.5 [PAL] [MDRES] [SSL]	K	38.4 [PAL] [MDRES] [SSL]	K	29.3 [PAL] [MDRES] [SSL]	K	29.6 [PAL] [MDRES] [SSL]	K		
7440-66-6	**ZINC**	37.5	46	**57.1 [BKG] [PAL] [SSL]**		**54.5 [BKG] [PAL] [SSL]**		25.3		29.1		**55.4 [BKG] [PAL] [SSL]**		**55.2 [BKG] [PAL] [SSL]**		40.4 [BKG]		42.3 [BKG]			
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA	17.6		21.4		19.8		16.9		22.9		20.9		21.6		21.6			
TTNUS002	PH (s.u.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	**82.4**		78.6		**80.2**		**83.1**		77.1		79.1		78.4		78.4			
	Volatile Organics (ug/kg)																				
71-43-2	**BENZENE**	NA	1.9	1.8	U	1.7	U	1.7	U	1.6	U	1.9	U	1.3	U	1.8	U	1.3	U		
75-15-0	CARBON DISULFIDE	NA	19000	1.8	U	1.7	U	1.7	U	1.6	U	1.9	U	1.3	U	1.8	U	1.3	U		
67-66-3	CHLOROFORM	NA	0.91	1.8	U	1.7	U	1.7	U	1.6	U	1.9	U	1.3	U	1.8	U	1.3	U		
60-29-7	DIETHYL ETHER	NA	NA	1.8	U	1.7	U	1.7	U	1.6	U	1.9	U	1.3	U	1.8	U	1.3	U		
75-09-2	METHYLENE CHLORIDE	NA	19	1.8	U	2.1	B	4.3	B	0.49	B	1.9	U	0.47	B	3.2	B	2.4	B		
108-88-3	TOLUENE	140	100	1.8	U	1.7	U	1.7	U	1.7	B	1.9	U	1.3	U	1.8	U	1.3	U		

TABLE 6-4

SURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			x04ss01400		x04ss01402		x04ss01500		x04ss01502		x04ss01600		x04ss01602		x04ss01700		x04ss01702					
	location			X04SS0140006		X04SS0140024		X04SS0150006		X04SS0150024		X04SS0160006		X04SS0160024		X04SS0170006		X04SS0170024					
	project_no			X04SB014		X04SB014		X04SB015		X04SB015		X04SB016		X04SB016		X04SB017		X04SB017					
	sample_coc			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061					
	gis_date			X04SS0140006		X04SS0140024		X04SS0150006		X04SS0150024		X04SS0160006		X04SS0160024		X04SS0170006		X04SS0170024					
	qc_type			20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317					
	sacode			NM		NM		NM		NM		NM		NM		NM		NM					
	matrix			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL					
	duplicate			SO		SO		SO		SO		SO		SO		SO		SO					
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00					
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00					
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT					
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS					
	z			061		063		065		067		069		071		073		075					
cas	x	utl95cv	minorpal	c_061		c_063		c_065		c_067		c_069		c_071		c_073		c_075					
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U				
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
88-72-2	2-NITROTOLUENE	0.15	2.9	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U				
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
99-99-0	4-NITROTOLUENE	0.21	30	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
2691-41-0	HMX	NA	380	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U				
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U				
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U				
	Inorganics (mg/kg)																						
7429-90-5	**ALUMINUM**	19700	7700	19600 [PAL] [ORNL] [MDRES]		18100 [PAL] [ORNL] [MDRES]		15600 [PAL] [ORNL] [MDRES]		16600 [PAL] [ORNL] [MDRES]		**20400 [BKG] [PAL] [ORNL] [MDRES]**		**19900 [BKG] [PAL] [ORNL] [MDRES]**		11500 [PAL] [ORNL] [MDRES]		12500 [PAL] [ORNL] [MDRES]					
7440-36-0	**ANTIMONY**	NA	0.27	0.11	B	0.096	B	0.049	J	0.033	UJ	0.16	UJ	0.033	UJ	0.033	J	0.033	UJ				
7440-38-2	ARSENIC	14.9	0.026	4.3 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.4 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	4.9 [PAL] [ORNL] [MDRES] [MDSGW]	K	4.9 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	K				
7440-39-3	BARIUM	80.4	330	74		81.3 [BKG]		50.7		68.9		55.1		70.7		42.3		42.1					
7440-41-7	BERYLLIUM	1.1	16	0.69	J	0.72	J	0.7	J	0.84	J	0.92	J	1.1		0.43	J	0.48	J				
7440-43-9	CADMIUM	2.5	0.36	0.16	U	0.17	U	0.16	U	0.16	U	0.19	J	0.17	U	0.083	U	0.082	U				
7440-70-2	CALCIUM	2060	NA	159		193		336		269		331		335		454		312					
7440-47-3	CHROMIUM	33.4	26	21.9		19.1		22.7		25.8		25.7		27.5 [PAL] [SSL]		18		15.8					
7440-48-4	COBALT	22.3	2.3	13.6 [PAL] [ORNL] [SSL]		15.2 [PAL] [ORNL] [SSL]		6.8 [PAL] [ORNL]		7.5 [PAL] [ORNL]		9.3 [PAL] [ORNL]		9.8 [PAL] [ORNL]		7.6 [PAL] [ORNL]		8.1 [PAL] [ORNL]					
7440-50-8	**COPPER**	20.3	28	12		9.1		18.9		18.7		**89 [BKG] [PAL] [SSL]**		**41.2 [BKG] [PAL] [SSL]**		**37.9 [BKG] [PAL] [SSL]**		23.4 [BKG]					
7439-89-6	IRON	38500	5500	18400 [PAL] [ORNL] [MDRES]		16700 [PAL] [ORNL] [MDRES]		17800 [PAL] [ORNL] [MDRES]		17800 [PAL] [ORNL] [MDRES]		24100 [PAL] [ORNL] [MDRES]		23300 [PAL] [ORNL] [MDRES]		11900 [PAL] [ORNL] [MDRES]		14100 [PAL] [ORNL] [MDRES]					
7439-92-1	**LEAD**	62.5	11	26 [PAL] [SSL]		18.7 [PAL] [SSL]		22.2 [PAL] [SSL]	K	19.5 [PAL] [SSL]	K	37.1 [PAL] [SSL]	K	18.7 [PAL] [SSL]	K	19.4 [PAL] [SSL]	K	19.1 [PAL] [SSL]	K				
7439-93-2	**LITHIUM**	NA	2	**15 [PAL] [OPLNT]**		**13.8 [PAL] [OPLNT]**		**19.4 [PAL] [ORNL] [OPLNT]**		**23.8 [PAL] [ORNL] [OPLNT]**		**22.9 [PAL] [ORNL] [OPLNT]**		**25.7 [PAL] [ORNL] [OPLNT]**		**12.2 [PAL] [OPLNT]**		**13.3 [PAL] [OPLNT]**					
7439-95-4	MAGNESIUM	1620	4400	991		946		1350		1740 [BKG]		1790 [BKG]		2090 [BKG]		1510		1090					
7439-96-5	MANGANESE	1390	160	719 [PAL] [ORNL] [MDRES] [SSL]		702 [PAL] [ORNL] [MDRES] [SSL]		180 [PAL] [MDRES]		119		309 [PAL] [ORNL] [MDRES] [SSL]		200 [PAL] [ORNL] [MDRES]		350 [PAL] [ORNL] [MDRES] [SSL]		294 [PAL] [ORNL] [MDRES] [SSL]					
7439-97-6	**MERCURY**	0.16	0.058	0.068 [PAL] [BTAG]	J	0.045	J	0.041	J	0.025	J	0.047	J	0.043	J	0.11 [PAL] [BTAG]	L	0.07 [PAL] [BTAG]	J				
7440-02-0	**NICKEL**	15.4	38	12.1		12.5		11.9		14.7		15		18.1 [BKG]		29.7 [BKG]		17.3 [BKG]					
7440-09-7	POTASSIUM	1470	NA	1210		1020		1890 [BKG]		2560 [BKG]		2070 [BKG]		2720 [BKG]		1340		1210					
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL				
7440-22-4	SILVER	0.84	4.2	0.16	U	0.17	U	0.16	U	0.16	U	0.16	U	0.17	U	0.083	U	0.082	U				
7440-23-5	SODIUM	120	NA	27.9	J	24.6	J	40.7	J	59.2		51		94		34		30.2					
7440-24-6	STRONTIUM	NA	120	5.6		5.9		8		10.4		9.5		11.9		7		6.1					
7440-31-5	**TIN**	NA	0.89	1.6	U	1.7	U	1.6	U	1.6	U	1.6	U	1.7	U	0.83	U	0.82	U				
7440-62-2	VANADIUM	53.3	7.8	32.8 [PAL] [MDRES] [SSL]		27.7 [PAL] [MDRES] [SSL]		34.5 [PAL] [MDRES] [SSL]	K	37.6 [PAL] [MDRES] [SSL]	K	36.8 [PAL] [MDRES] [SSL]	K	36.8 [PAL] [MDRES] [SSL]	K	26 [PAL] [MDRES] [SSL]	K	24.8 [PAL] [MDRES] [SSL]	K				
7440-66-6	**ZINC**	37.5	46	45.2 [BKG]		39.1 [BKG]		44.2 [BKG]		**48.4 [BKG] [PAL] [SSL]**		**54.5 [BKG] [PAL] [SSL]**		**63.9 [BKG] [PAL] [SSL]**		35.9		36.1					
	Miscellaneous																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA	29		21.7		23.4		21.4		25.5		22.1		22.6		20.3					
TTNUS002	PH (s.u.)	8.8	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																				
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	71		78.3		76.6		78.6		74.5		77.9		77.4		79.7					
	Volatile Organics (ug/kg)																						
71-43-2	**BENZENE**	NA	1.9	1.9	U	1.4	U	1.9	U	0.9	J	1.7	U	1.9	U	0.51	J	1.4	U				
75-15-0	CARBON DISULFIDE	NA	19000	1.9	U	1.4	U	1.9	U	2.2	U	1.7	U	1.9	U	1.9	U	1.4	U				
67-66-3	CHLOROFORM	NA	0.91	1.9	U	1.4	U	1.9	U	2.2	U	1.7	U	1.9	U	1.9	U	1.4	U				
60-29-7	DIETHYL ETHER	NA	NA	1.9	U	1.4	U	1.9	U	2.2	U	1.7	U	1.9	U	1.9	U	1.4	U				
75-09-2	METHYLENE CHLORIDE	NA	19	4.6	B	3.1	B	2.9	B	1.9	B	2.7	B	3.9	B	4.2	B	3.7	B				
108-88-3	TOLUENE	140	100	1.9	U	1.4	U	0.88	B	2.2	U	1.7	U	20.9	B	1.9	U	1.4	U				

	nsample			x04ss01800		x04ss01802		x04ss01900		x04ss01902		x04ss02000		x04ss02002			
	location			X04SS0180006		X04SS0180024		X04SS0190006		X04SS0190024		X04SS0200006		X04SS0200024			
	project_no			X04SB018		X04SB018		X04SB019		X04SB019		X04SB020		X04SB020			
	sample_coc			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061			
	gis_date			X04SS0180006		X04SS0180024		X04SS0190006		X04SS0190024		X04SS0200006		X04SS0200024			
	qc_type			20100317		20100317		20100317		20100317		20100317		20100317			
	sacode			NM		NM		NM		NM		NM		NM			
	matrix			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL			
	duplicate			SO		SO		SO		SO		SO		SO			
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00			
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00			
	depth_unit			FT		FT		FT		FT		FT		FT			
	submatrix			SS		SS		SS		SS		SS		SS			
	z			077		079		081		083		085		087			
cas	x	utl95cv	minorpal	c_077		c_079		c_081		c_083		c_085		c_087			
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.24	U	0.22	U	0.25	U	0.25	U		
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.22	U	0.25	U	0.25	U		
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	**0.43**	J	0.13	J	1.2	U	1.2	U		
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U		
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.19	U	0.18	U	0.2	U	0.2	U		
	Inorganics (mg/kg)																
7429-90-5	**ALUMINUM**	19700	7700	18100 [PAL] [ORNL] [MDRES]		18600 [PAL] [ORNL] [MDRES]		8240 [PAL] [ORNL] [MDRES]		7780 [PAL] [ORNL]		10500 [PAL] [ORNL] [MDRES]		11800 [PAL] [ORNL] [MDRES]			
7440-36-0	**ANTIMONY**	NA	0.27	0.065	B	0.033	B	0.14	B	0.074	B	0.045	J	0.033	UJ		
7440-38-2	ARSENIC	14.9	0.026	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	K	3 [PAL] [ORNL] [MDRES] [MDSGW]	K	3 [PAL] [ORNL] [MDRES] [MDSGW]	K		
7440-39-3	BARIUM	80.4	330	42.3		46.6		52.8		28.9		34.6		56.1			
7440-41-7	BERYLLIUM	1.1	16	0.43	J	0.49	J	0.36	J	0.26	J	0.37	J	0.57			
7440-43-9	CADMIUM	2.5	0.36	0.16	U	0.082	U	0.23	J	0.082	U	0.083	U	0.082	U		
7440-70-2	CALCIUM	2060	NA	334		275		35900 [BKG]		11900 [BKG]		250		266			
7440-47-3	CHROMIUM	33.4	26	18.1		18.9		15.2		12		13.6		17			
7440-48-4	COBALT	22.3	2.3	4.6 [PAL] [ORNL]		5.2 [PAL] [ORNL]		2.6 [PAL] [ORNL]		3.4 [PAL] [ORNL]		9.8 [PAL] [ORNL]		10 [PAL] [ORNL]			
7440-50-8	**COPPER**	20.3	28	10.7		11.7		22.5 [BKG]		**42.9 [BKG] [PAL] [SSL]**		27.2 [BKG]		13.7			
7439-89-6	IRON	38500	5500	15100 [PAL] [ORNL] [MDRES]		13300 [PAL] [ORNL] [MDRES]		7250 [PAL] [ORNL] [MDRES]		6260 [PAL] [ORNL] [MDRES]		11100 [PAL] [ORNL] [MDRES]		12600 [PAL] [ORNL] [MDRES]			
7439-92-1	**LEAD**	62.5	11	11.8 [PAL] [SSL]		13.8 [PAL] [SSL]		21 [PAL] [SSL]		15.2 [PAL] [SSL]		24.2 [PAL] [SSL]	K	14 [PAL] [SSL]	K		
7439-93-2	**LITHIUM**	NA	2	**15.9 [PAL] [OPLNT]**		**16.7 [PAL] [ORNL] [OPLNT]**		**4.4 [PAL] [OPLNT]**		**5.1 [PAL] [OPLNT]**		**11.8 [PAL] [OPLNT]**		**13.4 [PAL] [OPLNT]**			
7439-95-4	MAGNESIUM	1620	4400	994		1370		3460 [BKG]		1570		831		970			
7439-96-5	MANGANESE	1390	160	121		80.4		230 [PAL] [ORNL] [MDRES] [SSL]		93.9		282 [PAL] [ORNL] [MDRES] [SSL]		323 [PAL] [ORNL] [MDRES] [SSL]			
7439-97-6	**MERCURY**	0.16	0.058	0.049	J	0.028	J	**0.57 [BKG] [PAL] [BTAG]**	J	**0.52 [BKG] [PAL] [BTAG]**	J	0.10 [PAL] [BTAG]	L	0.047	J		
7440-02-0	**NICKEL**	15.4	38	11		12.1		**63.6 [BKG] [PAL] [SSL]**		**84.4 [BKG] [PAL] [SSL]**		17.3 [BKG]		16.2 [BKG]			
7440-09-7	POTASSIUM	1470	NA	1560 [BKG]		1520 [BKG]		507		521		1130		1660 [BKG]			
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.033	UL	0.16	UL		
7440-22-4	SILVER	0.84	4.2	0.16	U	0.082	U	0.79		0.11	J	0.083	U	0.082	U		
7440-23-5	SODIUM	120	NA	32.6	J	39.9		39.8		24	J	25.3		41.8			
7440-24-6	STRONTIUM	NA	120	6.4		7.2		49.1		19		5.6		7.3			
7440-31-5	**TIN**	NA	0.89	1.6	U	0.82	U	0.82	U	0.82	U	0.83	U	0.82	U		
7440-62-2	VANADIUM	53.3	7.8	25.8 [PAL] [MDRES] [SSL]		26.8 [PAL] [MDRES] [SSL]		11.4 [PAL] [MDRES] [SSL]		11.4 [PAL] [MDRES] [SSL]		29 [PAL] [MDRES] [SSL]	K	28.5 [PAL] [MDRES] [SSL]	K		
7440-66-6	**ZINC**	37.5	46	33.1		35.1		**63.4 [BKG] [PAL] [SSL]**		31.7		30.8		33.5			
	Miscellaneous																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA														
TTNUS288	PERCENT MOISTURE (%)	NA	NA	20		18.5		24.5		16.9		23.9		18.5			
TTNUS002	PH (s.u.)	8.8	NA														
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA														
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	**80**		**81.5**		75.5		**83.1**		76.1		**81.5**			
	Volatile Organics (ug/kg)																
71-43-2	**BENZENE**	NA	1.9	**3 [PAL] [MDSGW]**		1.7	U	**3.5 [PAL] [MDSGW]**		1.6	U	1.1	J	0.94	J		
75-15-0	CARBON DISULFIDE	NA	19000	1.6	U	1.7	U	2.2	U	0.42	J	1.8	U	1.6	U		
67-66-3	CHLOROFORM	NA	0.91	1.6	U	1.7	U	2.2	U	1.6	U	1.8	U	1.6	U		
60-29-7	DIETHYL ETHER	NA	NA	1.6	U	1.7	U	2.2	U	1.6	U	1.8	U	1.6	U		
75-09-2	METHYLENE CHLORIDE	NA	19	3.2	B	2.6	B	4.9	B	2.7	B	5.1	B	3.1	B		
108-88-3	TOLUENE	140	100	1.5	B	1.7	U	3.5	B	1.6	U	3.4	B	0.83	B		

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 6-5

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

	nsample			X04SB0010204		X04SB0010406		X04SB0020204		X04SB0020406		X04SB0030204		X04SB0030406		X04SB0040204		X04SB0040406			
	location			X04SB001		X04SB001		X04SB002		X04SB002		X04SB003		X04SB003		X04SB004		X04SB004			
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061			
	sample_coc			X04SB0010204		X04SB0010406		X04SB0020204		X04SB0020406		X04SB0030204		X04SB0030406		X04SB0040204		X04SB0040406			
	gis_date			20100316		20100316		20100316		20100316		20100317		20100317		20100316		20100316			
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM			
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL			
	matrix			SO		SO		SO		SO		SO		SO		SO		SO			
	duplicate																				
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00			
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00			
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT			
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB			
	z			001		003		005		007		009		011		013		015			
cas	x	utl95conv	minorpal	c_001		c_003		c_005		c_007		c_009		c_011		c_013		c_015			
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U		
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U		
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
2691-41-0	HMX	NA	380	0.20	UL	0.20	UL	0.19	UL	0.19	UL	0.20	U	0.20	U	0.20	UL	0.20	UL		
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U		
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U		
121-82-4	RDX	NA	5.5	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
479-45-8	TETRYL	NA	24	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U		
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	35400	7700	26000 [PAL] [ORNL] [MDRES]		14200 [PAL] [ORNL] [MDRES]		23500 [PAL] [ORNL] [MDRES]		10000 [PAL] [ORNL] [MDRES]		11400 [PAL] [ORNL] [MDRES]		12000 [PAL] [ORNL] [MDRES]		34100 [PAL] [ORNL] [MDRES]		23900 [PAL] [ORNL] [MDRES]			
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.033	UL	0.033	UL	0.033	UL	0.033	UL	0.032	UL	0.032	UL		
7440-38-2	ARSENIC	18.9	0.026	2.1 [PAL] [ORNL] [MDRES] [MDSGW]		2.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.7 [PAL] [ORNL] [MDRES] [MDSGW]		2.7 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		3.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]			
7440-39-3	BARIUM	134	330	95.9	K	52	K	41.9	K	34	K	44		44.4		100	K	60.9	K		
7440-41-7	BERYLLIUM	3.3	16	0.74	J	0.53		0.29	J	0.39	J	0.56	J	0.50		0.93	J	0.48	J		
7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.081	U	0.081	U	0.081	U	0.17	U	0.083	U	0.16	U	0.081	U		
7440-70-2	CALCIUM	2590	NA	154		126		86.9		53.2		67.9		98.6		76.1		63			
7440-47-3	CHROMIUM	60.1	26	26.8 [PAL] [SSL]	K	15.4	K	13.9	K	12.5	K	16.5		16		28.4 [PAL] [SSL]	K	16.1	K		
7440-48-4	COBALT	133	2.3	6.2 [PAL] [ORNL]		5 [PAL] [ORNL]		1.7		3.4 [PAL] [ORNL]		4.6 [PAL] [ORNL]		3.6 [PAL] [ORNL]		8.7 [PAL] [ORNL]		4.9 [PAL] [ORNL]			
7440-50-8	COPPER	48.6	28	13.2		9.7		4.7		5.9		8.2		7.6		13.6		7.7			
7439-89-6	IRON	83100	5500	22200 [PAL] [ORNL] [MDRES]		17100 [PAL] [ORNL] [MDRES]		6860 [PAL] [ORNL] [MDRES]		12900 [PAL] [ORNL] [MDRES]		20700 [PAL] [ORNL] [MDRES]		15500 [PAL] [ORNL] [MDRES]		29000 [PAL] [ORNL] [MDRES]		13000 [PAL] [ORNL] [MDRES]			
7439-92-1	LEAD	40.5	11	10		9.7		4.9		5.7		7.2		7.6		14.3 [PAL] [SSL]		6.1			
7439-93-2	**LITHIUM**	NA	2	**31.5 [PAL] [ORNL] [OPLNT]**		**15.3 [PAL] [OPLNT]**		**11.4 [PAL] [OPLNT]**		**10.8 [PAL] [OPLNT]**		**13 [PAL] [OPLNT]**		**13.3 [PAL] [OPLNT]**		**31.2 [PAL] [ORNL] [OPLNT]**		**14.7 [PAL] [OPLNT]**			
7439-95-4	MAGNESIUM	2640	4400	2070	K	1170	K	912	K	796	K	974		978		2110	K	1240	K		
7439-96-5	MANGANESE	4130	160	54.7		51.3		10.4		43.2		35.9		36.8		87.7		49.7			
7439-97-6	MERCURY	0.18	0.058	0.0069	UL	0.0068	UL	0.007	UL	0.0069	UL	0.0069	UL	0.007	UL	0.027	J	0.0068	UL		
7440-02-0	NICKEL	18.2	38	16		11.8		6.4		7.9		11.2		9.7		18.6 [BKG]		10.8			
7440-09-7	POTASSIUM	2610	NA	2790 [BKG]		1570		1580		1210		1500		1700		2850 [BKG]		1660			
7782-49-2	SELENIUM	13.3	0.52	0.033	UL	0.032	UL	0.16	UL	0.063	J	0.16	UL	0.16	UL	0.086	J	0.032	UL		
7440-22-4	SILVER	11.4	4.2	0.16	UL	0.081	UL	0.081	UL	0.081	UL	0.17	U	0.083	U	0.16	UL	0.081	UL		
7440-23-5	SODIUM	258	NA	97.6		51.9		52.9		35.4		47	J	59.3		99.2		68.9			
7440-24-6	STRONTIUM	NA	120	10.8		5.8		5.4		3.7		4.9		6		9.6		6			
7440-31-5	TIN	NA	0.89	1.7	UL	0.81	UL	0.82	UL	0.81	UL	1.7	U	0.83	U	1.6	UL	0.81	UL		
7440-62-2	VANADIUM	194	7.8	39 [PAL] [MDRES] [SSL]	K	23.8 [PAL] [MDRES] [SSL]	K	19.2 [PAL] [MDRES] [SSL]	K	15.3 [PAL] [MDRES] [SSL]	K	19.2 [PAL] [MDRES] [SSL]		19.4 [PAL] [MDRES] [SSL]		38.9 [PAL] [MDRES] [SSL]	K	23.9 [PAL] [MDRES] [SSL]	K		
7440-66-6	**ZINC**	70.4	46	43.2		31.9		15.5		24.2		30.4		24.7		50.2 [PAL] [SSL]		27.1			
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA	17.8		15.1		18.2		17.2		18.1		17.4		17.4		14.6			
TTNUS002	PH (s.u.)	NA	NA																		
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA																		
TTNUS046	TOTAL SOLIDS (%)	NA	NA	82.2		84.9		81.8		82.8		81.9		82.6		82.6		85.4			
	Volatile Organics (ug/kg)																				
71-43-2	**BENZENE**	NA	1.9	1.7	J	1.5	U	2.2	U	1.7	U	1.5	U	1.9	U	1.8	U	1.6	U		
75-15-0	CARBON DISULFIDE	NA	19000	1.8	U	1.5	U	2.2	U	1.7	U	1.5	U	1.9	U	1.8	U	1.6	U		
67-66-3	CHLOROFORM	NA	0.91	1.8	U	1.5	U	2.2	U	1.7	U	1.5	U	1.9	U	1.8	U	1.6	U		
60-29-7	DIETHYL ETHER	NA	NA	1.8	U	1.5	U	2.2	U	1.7	U	1.5	U	1.9	U	1.8	U	1.6	U		
75-09-2	METHYLENE CHLORIDE	NA	19	1.8	U	1.5	U	1.9	J	1.7	U	2.3	B	3.8	B	2.1	K	1.6	U		
108-88-3	TOLUENE	NA	100	1.8	U	0.97	J	3.5		1.2	J	1.5	U	1.9	U	1.8	U	1.6	U		

TABLE 6-5

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

	nsample			X04SB0050204		X04SB0050406		X04SB0060204		X04SB0060406		X04SB0070204		X04SB0070204-AVG		X04SB0070204-D		X04SB0070406	
	location			X04SB005		X04SB005		X04SB006		X04SB006		X04SB007		X04SB007		X04SB007		X04SB007	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SB0050204		X04SB0050406		X04SB0060204		X04SB0060406		X04SB0070204		X04SB0070204-AVG		FD031610-02		X04SB0070406	
	gis_date			20100316		20100316		20100316		20100316		20100316		20100316		20100316		20100316	
	qc_type			NM		NM		NM		NM		NM		NM		FD		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate															X04SB0070204			
	top_depth			2.00		4.00		2.00		4.00		2.00		2.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		4.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB	
	z			017		019		021		023		025		026		028		031	
cas	x	utl95conv	minorpal	c_017		c_019		c_021		c_023		c_025		c_026		c_028		c_031	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.245	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.245	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
2691-41-0	HMX	NA	380	0.20	UL	0.19	UL	0.20	UL	0.20	UL	0.19	UL	0.195	UL	0.20	UL	0.20	UL
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.1	U	1.2	U	1.2	U	1.1	U	1.15	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.1	U	1.2	U	1.2	U	1.1	U	1.15	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
479-45-8	TETRYL	NA	24	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U	0.20	U
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	35400	7700	16100 [PAL] [ORNL] [MDRES]		23100 [PAL] [ORNL] [MDRES]		18100 [PAL] [ORNL] [MDRES]		21000 [PAL] [ORNL] [MDRES]		32200 [PAL] [ORNL] [MDRES]	J	24550 [PAL] [ORNL] [MDRES]	J	16900 [PAL] [ORNL] [MDRES]	J	19700 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.032	UL	0.032	UL	0.032	UL	0.032	UL	0.032	UL	0.032	UL
7440-38-2	ARSENIC	18.9	0.026	4.5 [PAL] [ORNL] [MDRES] [MDSGW]		2.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]		2.5 [PAL] [ORNL] [MDRES] [MDSGW]		2.3 [PAL] [ORNL] [MDRES] [MDSGW]		2.55 [PAL] [ORNL] [MDRES] [MDSGW]		2.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.6 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	29.7	K	58.3	K	18.2	K	45.3	K	31.8	K	41.8	K	51.8	K	29.4	K
7440-41-7	BERYLLIUM	3.3	16	0.41	J	0.56	J	0.19	J	0.47	J	0.33	J	0.415	J	0.50	J	0.31	J
7440-43-9	CADMIUM	0.61	0.36	0.08	U	0.16	U	0.082	U	0.16	U	0.083	U	0.1215	U	0.16	U	0.081	U
7440-70-2	CALCIUM	2590	NA	35.2		52.5		41.2		115		75.9		96.45		117		55.4	
7440-47-3	CHROMIUM	60.1	26	12.4	K	19.6	K	7	K	19.1	K	12.6	K	15.95	K	19.3		12.7	K
7440-48-4	COBALT	133	2.3	3.4 [PAL] [ORNL]		5 [PAL] [ORNL]		1.9		2.4 [PAL] [ORNL]	L	2.8 [PAL] [ORNL]		3.3 [PAL] [ORNL]		3.8 [PAL] [ORNL]		2.2	
7440-50-8	COPPER	48.6	28	6.1		10.8		3.4		8.6		6		7.25		8.5		6.4	
7439-89-6	IRON	83100	5500	18900 [PAL] [ORNL] [MDRES]		20800 [PAL] [ORNL] [MDRES]		8050 [PAL] [ORNL] [MDRES]		20400 [PAL] [ORNL] [MDRES]		12900 [PAL] [ORNL] [MDRES]		15200 [PAL] [ORNL] [MDRES]		17500 [PAL] [ORNL] [MDRES]		12200 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	4.2	L	7		2.7		7.6		5.9		7.15		8.4		6	
7439-93-2	**LITHIUM**	NA	2	**9.7 [PAL] [OPLNT]**		**15.7 [PAL] [OPLNT]**		**7.9 [PAL] [OPLNT]**		**14.3 [PAL] [OPLNT]**		**11.8 [PAL] [OPLNT]**		**14.45 [PAL] [OPLNT]**		**17.1 [PAL] [ORNL] [OPLNT]**		**11.8 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	646	K	1420	K	484	K	901	K	772	K	941	K	1110	K	706	K
7439-96-5	MANGANESE	4130	160	78.2		95.4		24.2		40.4		50.3		46.15		42		36.6	
7439-97-6	MERCURY	0.18	0.058	0.007	UL	0.0068	UL	0.0069	UL	0.0099	J	0.019	J	0.025	J	0.031	J	0.019	J
7440-02-0	NICKEL	18.2	38	7.8	K	12.9		4.9		8.5	K	7.4		9		10.6		6.6	
7440-09-7	POTASSIUM	2610	NA	811		1500		516		1860		906	J	1338	J	1770	J	901	
7782-49-2	SELENIUM	13.3	0.52	0.083	J	0.032	UL	0.032	UL	0.034	J	0.032	UL	0.096	UL	0.16	UL	0.032	UL
7440-22-4	SILVER	11.4	4.2	0.08	UL	0.16	UL	0.082	UL	0.16	UL	0.083	UL	0.1215	UL	0.16	UL	0.081	UL
7440-23-5	SODIUM	258	NA	28.8		65.2		10.6	J	46.1	J	21	J	31.5	J	42	J	26.8	
7440-24-6	STRONTIUM	NA	120	2.9	K	5.6		2.1		6.8		4.2	J	5.7	J	7.2	J	3.8	
7440-31-5	TIN	NA	0.89	0.80	UL	1.6	UL	0.83	UL	1.6	UL	0.83	UL	1.215	UL	1.6	UL	0.81	UL
7440-62-2	VANADIUM	194	7.8	13.7 [PAL] [MDRES] [SSL]	K	26 [PAL] [MDRES] [SSL]	K	9.8 [PAL] [MDRES] [SSL]	K	24.6 [PAL] [MDRES] [SSL]	K	17.9 [PAL] [MDRES] [SSL]	K	22.35 [PAL] [MDRES] [SSL]	K	26.8 [PAL] [MDRES] [SSL]	K	18.3 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	70.4	46	21.3		31.5		16		22.9		21.1		25.7		30.3		20	
	Miscellaneous																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																
TTNUS288	PERCENT MOISTURE (%)	NA	NA	15.2		17.7		16.3		18.9		18.2		19.35		20.5		19.9	
TTNUS002	PH (s.u.)	NA	NA																
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA																
TTNUS046	TOTAL SOLIDS (%)	NA	NA	84.8		82.3		83.7		81.1		81.8		80.65		79.5		80.1	
	Volatile Organics (ug/kg)																		
71-43-2	**BENZENE**	NA	1.9	1.7	U	1.9	U	1.6	U	**2.8 [PAL] [MDSGW]**		1.4	U	1.45	U	1.5	U	1.5	UJ
75-15-0	CARBON DISULFIDE	NA	19000	1.7	U	1.9	U	1.6	U	1.4	U	1.4	U	1.45	U	1.5	U	1.5	UJ
67-66-3	CHLOROFORM	NA	0.91	1.7	U	1.9	U	1.6	U	1.4	U	1.4	U	1.45	U	1.5	U	1.5	UJ
60-29-7	DIETHYL ETHER	NA	NA	1.7	U	1.9	U	1.6	U	1.4	U	1.4	U	1.45	U	1.5	U	1.5	UJ
75-09-2	METHYLENE CHLORIDE	NA	19	1.7	U	1.9	U	1.6	U	1.4	U	1.4	U	1.45	U	1.5	U	1.6	J
108-88-3	TOLUENE	NA	100	1.7	U	1.9	U	1.6	U	8		1.4	U	0.64	J	0.64	J	1.5	UJ

TABLE 6-5

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

	nsample			X04SB0080204		X04SB0080406		X04SB0090204		X04SB0090406		X04SB0090406-AVG		X04SB0090406-D		X04SB0100204		X04SB0100406	
	location			X04SB008		X04SB008		X04SB009		X04SB009		X04SB009		X04SB009		X04SB010		X04SB010	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SB0080204		X04SB0080406		X04SB0090204		X04SB0090406		X04SB0090406-AVG		FD031610-03		X04SB0100204		X04SB0100406	
	gis_date			20100316		20100316		20100316		20100316		20100316		20100316		20100316		20100316	
	qc_type			NM		NM		NM		NM		NM		FD		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate													X04SB0090406					
	top_depth			2.00		4.00		2.00		4.00		4.00		4.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00		6.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB	
	z			033		035		037		039		040		042		045		047	
cas	x	utl95conv	minorpal	c_033		c_035		c_037		c_039		c_040		c_042		c_045		c_047	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
2691-41-0	HMX	NA	380	0.20	UL	0.20	UL	0.20	UL	0.20	UL	0.20	UL	0.20	UL	0.20	UL	0.20	UL
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
479-45-8	TETRYL	NA	24	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	35400	7700	9410 [PAL] [ORNL] [MDRES]		15200 [PAL] [ORNL] [MDRES]		20000 [PAL] [ORNL] [MDRES]		21300 [PAL] [ORNL] [MDRES]		20750 [PAL] [ORNL] [MDRES]		20200 [PAL] [ORNL] [MDRES]		7310		16100 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.033	UL	0.032	UL	0.032	UL	0.032	UL	0.032	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	1.3 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		6.3 [PAL] [ORNL] [MDRES] [MDSGW]		5.05 [PAL] [ORNL] [MDRES] [MDSGW]		3.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.7 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	54.1	K	52.1	K	32.7	K	57.3	K	61.8	K	66.3	K	13.3	K	44	K
7440-41-7	BERYLLIUM	3.3	16	0.53		0.55		0.37	J	0.54		0.585		0.63		0.23	J	0.54	J
7440-43-9	CADMIUM	0.61	0.36	0.08	U	0.081	U	0.082	U	0.083	U	0.0825	U	0.082	U	0.081	U	0.17	U
7440-70-2	CALCIUM	2590	NA	151		137		58.8		118		123.5		129		22		481	
7440-47-3	CHROMIUM	60.1	26	17.5	K	23.6	K	14.1	K	22.3	K	25.5	K	28.7 [PAL] [SSL]		6.5	K	20.1	
7440-48-4	COBALT	133	2.3	7.3 [PAL] [ORNL]		2.8 [PAL] [ORNL]		3.9 [PAL] [ORNL]		3.5 [PAL] [ORNL]		3.9 [PAL] [ORNL]		4.3 [PAL] [ORNL]		1.9		4.4 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	7.4		12.1		7.2		11.1		11.95		12.8		3.8		10.3	
7439-89-6	IRON	83100	5500	15500 [PAL] [ORNL] [MDRES]		14100 [PAL] [ORNL] [MDRES]		15100 [PAL] [ORNL] [MDRES]		12900 [PAL] [ORNL] [MDRES]		13300 [PAL] [ORNL] [MDRES]		13700 [PAL] [ORNL] [MDRES]		10100 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	8.6		10.6		6.6		10.1		10.6		11.1 [PAL] [SSL]		3.2		13 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	**16.3 [PAL] [ORNL] [OPLNT]**		**21.2 [PAL] [ORNL] [OPLNT]**		**13.4 [PAL] [OPLNT]**		**20.1 [PAL] [ORNL] [OPLNT]**		**22.25 [PAL] [ORNL] [OPLNT]**		**24.4 [PAL] [ORNL] [OPLNT]**		**5 [PAL] [OPLNT]**		**15.7 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1140	K	1350	K	823	K	1460	K	1590	K	1720	K	328	K	1160	K
7439-96-5	MANGANESE	4130	160	145		25.3		26.1		29.2		32.6		36		14.4		55.5	
7439-97-6	MERCURY	0.18	0.058	0.01	J	0.015	J	0.034	J	0.023	J	0.0215	J	0.02	J	0.0069	UL	0.017	J
7440-02-0	NICKEL	18.2	38	11.9		10.6		9.6		11.1		12		12.9		4.4	K	13.1	
7440-09-7	POTASSIUM	2610	NA	1500		1580		953		2070		2050		2030		386		1450	
7782-49-2	SELENIUM	13.3	0.52	0.033	UL	0.032	UL	0.033	UL	0.16	UL	0.16	UL	0.16	UL	0.032	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.08	UL	0.081	UL	0.082	UL	0.083	UL	0.0825	UL	0.082	UL	0.081	UL	0.17	UL
7440-23-5	SODIUM	258	NA	52.6		78.7		27.8		109		116		123		17.2	J	60.5	
7440-24-6	STRONTIUM	NA	120	6.8		7.5		4.1		7.9		8.2		8.5		1.5	K	7	
7440-31-5	TIN	NA	0.89	0.80	UL	0.81	UL	0.82	UL	0.83	UL	0.83	UL	0.83	UL	0.81	UL	1.7	U
7440-62-2	VANADIUM	194	7.8	26.3 [PAL] [MDRES] [SSL]	K	26.5 [PAL] [MDRES] [SSL]	K	19.7 [PAL] [MDRES] [SSL]	K	31.4 [PAL] [MDRES] [SSL]	K	30.85 [PAL] [MDRES] [SSL]	K	30.3 [PAL] [MDRES] [SSL]	K	7.7	K	26.4 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	70.4	46	32.8		32.5		28.6		32.4		34.25		36.1		12.5		32.5	
	Miscellaneous																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	36.4	J	37.5	J												
TTNUS288	PERCENT MOISTURE (%)	NA	NA	18.1		19.3		18.8		17.2		17.5		17.8		15.8		19.4	
TTNUS002	PH (s.u.)	NA	NA	5.3		4.61													
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA	777	J	585	UL												
TTNUS046	TOTAL SOLIDS (%)	NA	NA	81.9		80.7		81.2		82.8		82.5		82.2		84.2		80.6	
	Volatile Organics (ug/kg)																		
71-43-2	**BENZENE**	NA	1.9	**6.3 [PAL] [MDSGW]**		1.6	U	1.9 [MDSGW] [BTAG]	J	1.7	U	1.75	U	1.8	U	1.4	U	1.4	U
75-15-0	CARBON DISULFIDE	NA	19000	1.6	U	1.6	U	1.9	U	1.7	U	1.75	U	1.8	U	1.4	U	1.4	U
67-66-3	CHLOROFORM	NA	0.91	1.6	U	1.6	U	1.9	U	1.7	U	1.75	U	1.8	U	1.4	U	1.4	U
60-29-7	DIETHYL ETHER	NA	NA	1.6	U	1.6	U	1.9	U	1.7	U	1.75	U	1.8	U	1.4	U	1.4	U
75-09-2	METHYLENE CHLORIDE	NA	19	1.9	K	0.74	J	1.9	U	1.7	U	1.75	U	1.8	U	3.2		1.9	
108-88-3	TOLUENE	NA	100	0.47	J	1.6	U	1.9	U	1.7	U	1.75	U	1.8	U	1.4	U	1.4	U

TABLE 6-5

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

	nsample			X04SB0110204		X04SB0110406		X04SB0120204		X04SB0120406		X04SB0130204		X04SB0130406		X04SB0140204		X04SB0140406	
	location			X04SB011		X04SB011		X04SB012		X04SB012		X04SB013		X04SB013		X04SB014		X04SB014	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SB0110204		X04SB0110406		X04SB0120204		X04SB0120406		X04SB0130204		X04SB0130406		X04SB0140204		X04SB0140406	
	gis_date			20100316		20100316		20100317		20100317		20100317		20100317		20100316		20100316	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																		
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB	
	z			049		051		053		055		057		059		061		063	
cas	x	utl95conv	minorpal	c_049		c_051		c_053		c_055		c_057		c_059		c_061		c_063	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
2691-41-0	HMX	NA	380	0.20	UL	0.20	UL	0.19	U	0.20	U	0.20	U	0.20	U	0.20	UL	0.20	UL
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
479-45-8	TETRYL	NA	24	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	35400	7700	18300 [PAL] [ORNL] [MDRES]		20500 [PAL] [ORNL] [MDRES]		21200 [PAL] [ORNL] [MDRES]		14600 [PAL] [ORNL] [MDRES]		19100 [PAL] [ORNL] [MDRES]		13900 [PAL] [ORNL] [MDRES]		22700 [PAL] [ORNL] [MDRES]		7420	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.032	UL	0.16	UL	0.16	UL	0.033	UL	0.033	UL	0.032	UL	0.032	UL
7440-38-2	ARSENIC	18.9	0.026	1.5 [PAL] [ORNL] [MDRES] [MDSGW]		6.2 [PAL] [ORNL] [MDRES] [MDSGW]		0.68 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]		2.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		4.1 [PAL] [ORNL] [MDRES] [MDSGW]		1.4 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	34	K	63.7	K	92.1		77.8		70.8		42.9		72.9	K	56.5	K
7440-41-7	BERYLLIUM	3.3	16	0.42	J	0.65	J	0.85		0.99	J	0.71	J	0.42	J	0.75	J	0.66	
7440-43-9	CADMIUM	0.61	0.36	0.081	U	0.16	U	0.082	U	0.17	U	0.16	U	0.083	U	0.16	U	0.082	U
7440-70-2	CALCIUM	2590	NA	114		151		362		282		233		148		409		92.5	
7440-47-3	CHROMIUM	60.1	26	18.7	K	27.8 [PAL] [SSL]		24.3		29.1 [PAL] [SSL]		22.9		14.3		29.2 [PAL] [SSL]	K	18	K
7440-48-4	COBALT	133	2.3	2.9 [PAL] [ORNL]	L	4.8 [PAL] [ORNL]		21.1 [PAL] [ORNL] [SSL]		26.1 [PAL] [ORNL] [SSL]		6.2 [PAL] [ORNL]		4 [PAL] [ORNL]		29.6 [PAL] [ORNL] [SSL]		6.2 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	10.5		14.1		10.7		13		10.3		4.8		7.3		8.2	
7439-89-6	IRON	83100	5500	17500 [PAL] [ORNL] [MDRES]		17500 [PAL] [ORNL] [MDRES]		13700 [PAL] [ORNL] [MDRES]		33200 [PAL] [ORNL] [MDRES]		18800 [PAL] [ORNL] [MDRES]		11600 [PAL] [ORNL] [MDRES]		25200 [PAL] [ORNL] [MDRES]		16900 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	9.7		12.3 [PAL] [SSL]		12.3 [PAL] [SSL]		14.9 [PAL] [SSL]		10.1		11		16.6 [PAL] [SSL]		9.7	
7439-93-2	**LITHIUM**	NA	2	**15.5 [PAL] [OPLNT]**		**25.6 [PAL] [ORNL] [OPLNT]**		**29.7 [PAL] [ORNL] [OPLNT]**		**17.4 [PAL] [ORNL] [OPLNT]**		**27.8 [PAL] [ORNL] [OPLNT]**		**14.2 [PAL] [OPLNT]**		**22.6 [PAL] [ORNL] [OPLNT]**		**20.6 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1070	K	1810	K	1950		1460		1860		1300		1890	K	1390	K
7439-96-5	MANGANESE	4130	160	42.7		41.1		130		247 [PAL] [ORNL] [MDRES] [SSL]		50.1		47.6		556 [PAL] [ORNL] [MDRES] [SSL]		54.2	
7439-97-6	MERCURY	0.18	0.058	0.018	J	0.038	J	0.034	UL	0.035	UL	0.007	UL	0.0069	UL	0.032	J	0.0068	UL
7440-02-0	NICKEL	18.2	38	9.7		13.1		25.3 [BKG]		20.7 [BKG]		17.4		10		18.6 [BKG]		14.2	
7440-09-7	POTASSIUM	2610	NA	1380		2360		1910		1380		1800		1320		1650		1590	
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.032	UL
7440-22-4	SILVER	11.4	4.2	0.081	UL	0.16	UL	0.082	U	0.17	U	0.16	U	0.083	U	0.16	UL	0.082	UL
7440-23-5	SODIUM	258	NA	36		69		460 [BKG]		427 [BKG]		332 [BKG]		78.9		57.4		74.9	
7440-24-6	STRONTIUM	NA	120	5.9		9.3		12.4		8.3		10		7.9		9.6		6.9	
7440-31-5	TIN	NA	0.89	0.82	UL	1.6	U	0.82	U	1.7	U	1.6	U	0.83	U	1.6	UL	0.82	UL
7440-62-2	VANADIUM	194	7.8	24.5 [PAL] [MDRES] [SSL]	K	36.2 [PAL] [MDRES] [SSL]	K	31.9 [PAL] [MDRES] [SSL]		27.1 [PAL] [MDRES] [SSL]		29.5 [PAL] [MDRES] [SSL]		20.5 [PAL] [MDRES] [SSL]		42.9 [PAL] [ORNL] [MDRES] [SSL]	K	29.3 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	70.4	46	27.4		38.5		**80.5 [BKG] [PAL] [SSL]**		61 [PAL] [SSL]		41.4		24.5		60.6 [PAL] [SSL]		43.1	
	Miscellaneous																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																
TTNUS288	PERCENT MOISTURE (%)	NA	NA	17.1		18.8		16.7		15.5		13.9		13		18.5		16.1	
TTNUS002	PH (s.u.)	NA	NA																
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA																
TTNUS046	TOTAL SOLIDS (%)	NA	NA	82.9		81.2		83.3		84.5		86.1		87		81.5		83.9	
	Volatile Organics (ug/kg)																		
71-43-2	**BENZENE**	NA	1.9	**5.8 [PAL] [MDSGW]**	J	1.6	U	**9 [PAL] [MDSGW]**		1.8	U	**2.2 [PAL] [MDSGW]**		**14 [PAL] [MDSGW]**		1.6	U	1.7	U
75-15-0	CARBON DISULFIDE	NA	19000	1.5	U	1.6	U	1.8	U	1.8	U	1.5	U	1.4	U	1.6	U	1.7	U
67-66-3	CHLOROFORM	NA	0.91	1.5	U	1.6	U	1.8	U	1.8	U	1.5	U	1.4	U	1.6	U	1.7	U
60-29-7	DIETHYL ETHER	NA	NA	1.5	U	1.6	U	1.8	U	1.8	U	1.5	U	1.4	U	1.6	U	1.7	U
75-09-2	METHYLENE CHLORIDE	NA	19	1.5	U	1.1	J	1.3	B	0.69	B	2.5	B	1.7	B	1.6	U	1.7	U
108-88-3	TOLUENE	NA	100	14.6	J	1.6	U	7.1	B	3	B	1.5	U	24.3	B	1.6	U	1.7	U

TABLE 6-5

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

	nsample			X04SB0150204		X04SB0150406		X04SB0160204		X04SB0160406			
	location			X04SB015		X04SB015		X04SB016		X04SB016			
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061			
	sample_coc			X04SB0150204		X04SB0150406		X04SB0160204		X04SB0160406			
	gis_date			20100317		20100317		20100317		20100317			
	qc_type			NM		NM		NM		NM			
	sacode			NORMAL		NORMAL		NORMAL		NORMAL			
	matrix			SO		SO		SO		SO			
	duplicate												
	top_depth			2.00		4.00		2.00		4.00			
	bottom_dep			4.00		6.00		4.00		6.00			
	depth_unit			FT		FT		FT		FT			
	submatrix			SB		SB		SB		SB			
	z			065		067		069		071			
cas	x	utl95conv	minorpal	c_065		c_067		c_069		c_071			
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.20	U	0.19	U	0.20	U		
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.20	U	0.19	U	0.20	U		
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.24	U	0.25	U		
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.20	U	0.19	U	0.20	U		
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.20	U	0.19	U	0.20	U		
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.19	U	0.20	U		
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.20	U	0.19	U	0.20	U		
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.25	U		
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.20	U	0.19	U	0.20	U		
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.19	U	0.20	U		
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.20	U	0.19	U	0.20	U		
2691-41-0	HMX	NA	380	0.20	U	0.20	U	0.19	U	0.20	U		
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.20	U	0.19	U	0.20	U		
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U		
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U		
121-82-4	RDX	NA	5.5	0.20	U	0.20	U	0.19	U	0.20	U		
479-45-8	TETRYL	NA	24	0.20	U	0.20	U	0.19	U	0.20	U		
	Inorganics (mg/kg)												
7429-90-5	ALUMINUM	35400	7700	21700 [PAL] [ORNL] [MDRES]		19800 [PAL] [ORNL] [MDRES]		11900 [PAL] [ORNL] [MDRES]		8790 [PAL] [ORNL] [MDRES]			
7440-36-0	ANTIMONY	1.8	0.27	0.16	UL	0.16	UL	0.033	UJ	0.033	UJ		
7440-38-2	ARSENIC	18.9	0.026	4.4 [PAL] [ORNL] [MDRES] [MDSGW]		0.83 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]	K	0.83 [PAL] [ORNL] [MDRES] [MDSGW]	K		
7440-39-3	BARIUM	134	330	94.2		94.2		68.4		64.6			
7440-41-7	BERYLLIUM	3.3	16	1.4		1		1.1		1.3			
7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.17	U	0.30	J	0.16	U		
7440-70-2	CALCIUM	2590	NA	304		657		418		374			
7440-47-3	CHROMIUM	60.1	26	28.6 [PAL] [SSL]		27.3 [PAL] [SSL]		26.6 [PAL] [SSL]		18.1			
7440-48-4	COBALT	133	2.3	15.3 [PAL] [ORNL] [SSL]		23.7 [PAL] [ORNL] [SSL]		11.6 [PAL] [ORNL]		20 [PAL] [ORNL] [SSL]			
7440-50-8	COPPER	48.6	28	15.1		13.2		14.4		12.1			
7439-89-6	IRON	83100	5500	30500 [PAL] [ORNL] [MDRES]		23600 [PAL] [ORNL] [MDRES]		22000 [PAL] [ORNL] [MDRES]		17500 [PAL] [ORNL] [MDRES]			
7439-92-1	LEAD	40.5	11	18.9 [PAL] [SSL]		11		11.3 [PAL] [SSL]	K	9.5	K		
7439-93-2	**LITHIUM**	NA	2	**31.6 [PAL] [ORNL] [OPLNT]**		**24.4 [PAL] [ORNL] [OPLNT]**		**27.3 [PAL] [ORNL] [OPLNT]**		**17.9 [PAL] [ORNL] [OPLNT]**			
7439-95-4	MAGNESIUM	2640	4400	2420		1820		1890		1600			
7439-96-5	MANGANESE	4130	160	135		183 [PAL] [ORNL] [MDRES]		72.7		206 [PAL] [ORNL] [MDRES]			
7439-97-6	MERCURY	0.18	0.058	0.035	UL	0.034	UL	0.012	J	0.02	J		
7440-02-0	NICKEL	18.2	38	23.8 [BKG]		30.4 [BKG]		21.1 [BKG]		18.1			
7440-09-7	POTASSIUM	2610	NA	2690 [BKG]		1460		1840		1880			
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL		
7440-22-4	SILVER	11.4	4.2	0.16	U	0.17	U	0.16	U	0.16	U		
7440-23-5	SODIUM	258	NA	226		398 [BKG]		218		286 [BKG]			
7440-24-6	STRONTIUM	NA	120	11.9		12.2		11.6		9.8			
7440-31-5	TIN	NA	0.89	1.6	U	1.7	U	1.6	U	1.6	U		
7440-62-2	VANADIUM	194	7.8	37.3 [PAL] [MDRES] [SSL]		29.5 [PAL] [MDRES] [SSL]		35.3 [PAL] [MDRES] [SSL]	K	22.9 [PAL] [MDRES] [SSL]	K		
7440-66-6	**ZINC**	70.4	46	**71.4 [BKG] [PAL] [SSL]**		**77 [BKG] [PAL] [SSL]**		**71.5 [BKG] [PAL] [SSL]**		43.5			
	Miscellaneous												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA										
TTNUS288	PERCENT MOISTURE (%)	NA	NA	20.1		21.8		18.7		7.9			
TTNUS002	PH (s.u.)	NA	NA										
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA										
TTNUS046	TOTAL SOLIDS (%)	NA	NA	79.9		78.2		81.3		92.1			
	Volatile Organics (ug/kg)												
71-43-2	**BENZENE**	NA	1.9	1.7	U	**4.4 [PAL] [MDSGW]**		1.5	U	1.7	U		
75-15-0	CARBON DISULFIDE	NA	19000	1.7	U	1.4	U	1.5	U	1.7	U		
67-66-3	CHLOROFORM	NA	0.91	1.7	U	1.4	U	1.5	U	1.7	U		
60-29-7	DIETHYL ETHER	NA	NA	1.7	U	1.4	U	1.5	U	1.7	U		
75-09-2	METHYLENE CHLORIDE	NA	19	1.1	B	1.5	B	1.9	B	3.1	B		
108-88-3	TOLUENE	NA	100	1.7	U	3.2	B	1.5	U	1.7	U		

TABLE 6-5

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

	nsample			X04SB0170204		X04SB0170406		X04SB0180204		X04SB0180406		X04SB0190204		X04SB0190406		X04SB0200204		X04SB0200406	
	location			X04SB017		X04SB017		X04SB018		X04SB018		X04SB019		X04SB019		X04SB020		X04SB020	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SB0170204		X04SB0170406		X04SB0180204		X04SB0180406		X04SB0190204		X04SB0190406		X04SB0200204		X04SB0200406	
	gis_date			20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																		
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB	
	z			073		075		077		079		081		083		085		087	
cas	x	utl95conv	minorpal	c_073		c_075		c_077		c_079		c_081		c_083		c_085		c_087	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
2691-41-0	HMX	NA	380	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
479-45-8	TETRYL	NA	24	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
	Inorganics (mg/kg)																		
7429-90-5	ALUMINUM	35400	7700	18500 [PAL] [ORNL] [MDRES]		11100 [PAL] [ORNL] [MDRES]		24700 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]		24500 [PAL] [ORNL] [MDRES]		23700 [PAL] [ORNL] [MDRES]		13100 [PAL] [ORNL] [MDRES]		17300 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.033	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.033	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	1.2 [PAL] [ORNL] [MDRES] [MDSGW]		5.4 [PAL] [ORNL] [MDRES] [MDSGW]		5.3 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.3 [PAL] [ORNL] [MDRES] [MDSGW]		2.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.7 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	59.9		54.6		81.3		82.2		82.6		70.7		47.5		68.2	
7440-41-7	BERYLLIUM	3.3	16	0.80	J	0.62		1.1		1		0.83	J	0.99		0.47	J	0.60	J
7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.083	U	0.16	U	0.16	U	0.17	U	0.16	U	0.16	U	0.16	U
7440-70-2	CALCIUM	2590	NA	179		120		288		524		233		263		137		177	
7440-47-3	CHROMIUM	60.1	26	20.9		18.9		29.5 [PAL] [SSL]		27.9 [PAL] [SSL]		29.6 [PAL] [SSL]		26		15.1		22.6	
7440-48-4	COBALT	133	2.3	8.6 [PAL] [ORNL]		6.1 [PAL] [ORNL]		10.2 [PAL] [ORNL]		24.3 [PAL] [ORNL] [SSL]		10.8 [PAL] [ORNL]		9.3 [PAL] [ORNL]		3.7 [PAL] [ORNL]		3.5 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	12.4		7		16.1		10.1		10.9		12.5		6.7		7.6	
7439-89-6	IRON	83100	5500	16100 [PAL] [ORNL] [MDRES]		14200 [PAL] [ORNL] [MDRES]		22200 [PAL] [ORNL] [MDRES]		18400 [PAL] [ORNL] [MDRES]		23000 [PAL] [ORNL] [MDRES]		21000 [PAL] [ORNL] [MDRES]		15600 [PAL] [ORNL] [MDRES]		16600 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	9		6.8		16.5 [PAL] [SSL]		11.3 [PAL] [SSL]		15.2 [PAL] [SSL]		10.2		8.3		8.9	
7439-93-2	**LITHIUM**	NA	2	**18.6 [PAL] [ORNL] [OPLNT]**		**12.8 [PAL] [OPLNT]**		**28.9 [PAL] [ORNL] [OPLNT]**		**28.6 [PAL] [ORNL] [OPLNT]**		**23.5 [PAL] [ORNL] [OPLNT]**		**24.2 [PAL] [ORNL] [OPLNT]**		**12.5 [PAL] [OPLNT]**		**17.6 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1990		1360		2430		1670		2220		2250		1170		1710	
7439-96-5	MANGANESE	4130	160	54.8		33.9		72.7		181 [PAL] [ORNL] [MDRES]		45.8		66.2		86		34.8	
7439-97-6	MERCURY	0.18	0.058	0.007	UL	0.007	UL	0.034	UL	0.035	UL	0.035	UL	0.035	UL	0.007	UL	0.007	UL
7440-02-0	NICKEL	18.2	38	15.3		11		19.9 [BKG]		24.7 [BKG]		19.3 [BKG]		17.7		8		10.6	
7440-09-7	POTASSIUM	2610	NA	1940		1720		2890 [BKG]		1660		2640 [BKG]		2340		919		2120	
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.16	U	0.083	U	0.16	U	0.16	U	0.17	U	0.16	U	0.16	U	0.16	U
7440-23-5	SODIUM	258	NA	64.2		62.2		225		388 [BKG]		205		329 [BKG]		40.6	J	170	
7440-24-6	STRONTIUM	NA	120	9		5		13.3		12.3		12.7		11.7		5		8.8	
7440-31-5	TIN	NA	0.89	1.6	U	0.83	U	1.6	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U
7440-62-2	VANADIUM	194	7.8	28.1 [PAL] [MDRES] [SSL]		21.5 [PAL] [MDRES] [SSL]		38.3 [PAL] [MDRES] [SSL]		31.5 [PAL] [MDRES] [SSL]		38.8 [PAL] [MDRES] [SSL]		33.2 [PAL] [MDRES] [SSL]		21.5 [PAL] [MDRES] [SSL]		30.7 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	39.7		28		54.7 [PAL] [SSL]		66.1 [PAL] [SSL]		52.4 [PAL] [SSL]		43.9		22.4		28.2	
	Miscellaneous																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																
TTNUS288	PERCENT MOISTURE (%)	NA	NA	15.4		15.3		17.2		17.8		17.4		22.6		14.3		16	
TTNUS002	PH (s.u.)	NA	NA																
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA																
TTNUS046	TOTAL SOLIDS (%)	NA	NA	84.6		84.7		82.8		82.2		82.6		77.4		85.7		84	
	Volatile Organics (ug/kg)																		
71-43-2	**BENZENE**	NA	1.9	1.6	U	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U	1.5	U	1.6	U
75-15-0	CARBON DISULFIDE	NA	19000	1.6	U	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U	1.5	U	1.6	U
67-66-3	CHLOROFORM	NA	0.91	1.6	U	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U	1.5	U	1.6	U
60-29-7	DIETHYL ETHER	NA	NA	1.6	U	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U	1.5	U	1.6	U
75-09-2	METHYLENE CHLORIDE	NA	19	0.88	B	3.7	B	1.5	B	1	B	1.7	B	0.84	B	2.1	B	1.9	B
108-88-3	TOLUENE	NA	100	0.43	B	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U	1.5	U	1.6	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indi
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 6-6

GROUNDWATER SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample							X04GW001		X04GW002		X04GW002-AVG		X04GW002-D		X04GW003	
	location							X04GW001		X04GW002		X04GW003		X04GW002		X04GW003	
	project_no							00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060	
	sample_coc							X04GW001		X04GW002		X04GW002-AVG		FD031410-01		X04GW003	
	gis_date							20100314		20100314		20100314		20100314		20100313	
	qc_type							NM		NM		NM		FD		NM	
	sacode							NORMAL		ORIG		AVG		DUP		NORMAL	
	matrix							GW		GW		GW		GW		GW	
	duplicate													X04GW002			
	top_depth							-9999.00		-9999.00		-9999.00		-9999.00		-9999.00	
	bottom_dep							-9999.00		-9999.00		-9999.00		-9999.00		-9999.00	
	depth_unit							NA		NA		NA		NA		NA	
	submatrix							NA		NA		NA		NA		NA	
	z							001		003		004		006		009	
cas	x	minorpal	ornltap	ornltap_b	mcl	mde	reference	c_001		c_003		c_004		c_006		c_009	
	Explosives (ug/L)																
99-35-4	1,3,5-TRINITROBENZENE	110	110	N	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
99-65-0	1,3-DINITROBENZENE	0.37	0.37	N	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	2.2	2.2	C	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.095	J
121-14-2	2,4-DINITROTOLUENE	0.22	0.22	C	NA	7.3	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
606-20-2	2,6-DINITROTOLUENE	3.7	3.7	N	NA	3.7	MDE Cleanup Standard	0.19	U	0.2	U	0.2	U			0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	7.3	7.3	N	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
88-72-2	2-NITROTOLUENE	0.31	0.31	C	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA		NA	NA	NA	0.19	U	0.2	U	0.2	U			0.19	U
99-08-1	3-NITROTOLUENE	0.37	0.37	N	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	7.3	7.3	N	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
99-99-0	4-NITROTOLUENE	4.2	4.2	C	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
2691-41-0	HMX	180	180	N	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
98-95-3	NITROBENZENE	0.12	0.12	C	NA	0.35	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
55-63-0	NITROGLYCERIN	0.37	0.37	N	NA	NA	ORNL-R	1.4	UJ	1.5	UJ	1.5	UJ			1.4	UJ
78-11-5	PETN	NA	NA		NA	NA	NA	1.4	U	1.5	U	1.5	U			1.4	U
121-82-4	RDX	0.61	0.61	C	NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U
479-45-8	TETRYL	15	15	N	NA	NA	ORNL-R	0.29	U	0.3	U	0.3	U			0.29	U
	Inorganics (ug/L)																
7429-90-5	**ALUMINUM**	50	3700	N	50	50	MDE Cleanup Standard	**180 [PAL] [MCL] [MDE]**	J	**68.0 [PAL] [MCL] [MDE]**	J	**934 [PAL] [MCL] [MDE]**	J	**1800 [PAL] [MCL] [MDE]**	J	**1900 [PAL] [MCL] [MDE]**	J
7440-36-0	ANTIMONY	1.5	1.5	N	6	6	ORNL-R	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U
7440-38-2	**ARSENIC**	0.045	0.045	C	10	10	ORNL-R	**1.3 [PAL] [ORNLTAP]**	J	1.0	U	1.0	U	1.0	U	1.0	U
7440-39-3	BARIUM	730	730	N	2000	2000	ORNL-R	140	J	77.0	J	55.0	J	33.0	J	42.0	J
7440-41-7	BERYLLIUM	4	7.3	N	4	4	MDE Cleanup Standard	0.3	U	0.44	J	0.39	J	0.34	J	0.3	U
7440-43-9	CADMIUM	1.8	1.8	N	5	5	ORNL-R	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U
7440-70-2	CALCIUM	NA	NA		NA	NA	NA	5600		1400		1350		1300		540	
7440-47-3	CHROMIUM	100	5500	N	100	100	MDE Cleanup Standard	2.0	U	2.0	U	4.9		8.8		3.4	J
7440-48-4	**COBALT**	1.1	1.1	N	NA	NA	ORNL-R	**22.0 [PAL] [ORNLTAP]**	J	**4.3 [PAL] [ORNLTAP]**	J	**10.15 [PAL] [ORNLTAP]**	J	**16.0 [PAL] [ORNLTAP]**	J	**5.9 [PAL] [ORNLTAP]**	J
7440-50-8	COPPER	150	150	N	1300	1300	ORNL-R	3.6	U	5.9	J	6.35	J	6.8	J	3.7	J
7439-89-6	**IRON**	300	2600	N	300	300	MDE Cleanup Standard	220	J	74.0	J	**1087 [PAL] [MCL] [MDE]**	J	**2100 [PAL] [MCL] [MDE]**	J	**1500 [PAL] [MCL] [MDE]**	J
7439-92-1	LEAD	15	NA		15	15	MDE Cleanup Standard	2.2	U	2.2	U	5.5	L	9.9	L	2.2	U
7439-93-2	LITHIUM	7.3	7.3	N	NA	NA	ORNL-R	36.0	U	36.0	U	36.0	U	36.0	U	36.0	U
7439-95-4	MAGNESIUM	NA	NA		NA	NA	NA	6000	J	4300	J	2545	J	790	J	2100	J
7439-96-5	**MANGANESE**	50	88	N	50	50	MDE Cleanup Standard	**200 [PAL] [ORNLTAP] [MCL] [MDE]**	J	**110 [PAL] [ORNLTAP] [MCL] [MDE]**	J	**78.5 [PAL] [MCL] [MDE]**	J	47.0	J	23.0	J
7439-97-6	MERCURY	1.1	1.1	N	2	2	ORNL-R	0.077	U	0.077	U	0.078	U	0.077	U	0.077	U
7440-02-0	NICKEL	73	73	N	NA	73	MDE Cleanup Standard	30.0		21.0	J	15.5	J	10.0	J	7.3	U
7440-09-7	POTASSIUM	NA	NA		NA	NA	NA	1700		2800		2600	J	2400	J	1800	
7782-49-2	SELENIUM	18	18	N	50	50	ORNL-R	7.7	B	2.8	J	3.4	J	4.0	B	2.9	B
7440-22-4	SILVER	18	18	N	100	100	ORNL-R	1.4	U	1.4	U	1.4	UL	1.4	UL	1.4	U
7440-23-5	SODIUM	NA	NA		NA	NA	NA	59800	J	6000	J	4650	J	3300	J	5100	J
7440-24-6	STRONTIUM	2200	2200	N	NA	NA	ORNL-R	57.0		16.0		13.5		11.0		8.9	
7440-31-5	TIN	2200	2200	N	NA	2200	MDE Cleanup Standard	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U
7440-62-2	**VANADIUM**	3.7	18	N	NA	3.7	MDE Cleanup Standard	2.0	U	2.0	U	**4.6 [PAL] [MDE]**		**8.2 [PAL] [MDE]**		**4.4 [PAL] [MDE]**	J
7440-66-6	ZINC	1100	1100	N	5000	5000	ORNL-R	45.0		53.0		33.0	J	13.0	J	11.0	J
	Inorganics, Filtered (ug/L)																
7429-90-5	**ALUMINUM**	50	3700	N	50	50	MDE Cleanup Standard									**78 [PAL] [MCL] [MDE]**	J
7440-36-0	ANTIMONY	1.5	1.5	N	6	6	ORNL-R									0.66	U
7440-38-2	ARSENIC	0.045	0.045	C	10	10	ORNL-R									1	U
7440-39-3	BARIUM	730	730	N	2000	2000	ORNL-R									30	
7440-41-7	BERYLLIUM	4	7.3	N	4	4	MDE Cleanup Standard									0.6	B
7440-43-9	CADMIUM	1.8	1.8	N	5	5	ORNL-R									0.33	U
7440-70-2	CALCIUM	NA	NA		NA	NA	NA									600	
7440-47-3	CHROMIUM	100	5500	N	100	100	MDE Cleanup Standard									1.6	U
7440-48-4	**COBALT**	1.1	1.1	N	NA	NA	ORNL-R									**5.8 [PAL] [ORNLTAP]**	
7440-50-8	COPPER	150	150	N	1300	1300	ORNL-R									3.3	U
7439-89-6	IRON	300	2600	N	300	300	MDE Cleanup Standard									20	U
7439-92-1	LEAD	15	NA		15	15	MDE Cleanup Standard									2	UL
7439-93-2	LITHIUM	7.3	7.3	N	NA	NA	ORNL-R									33	U
7439-95-4	MAGNESIUM	NA	NA		NA	NA	NA									1900	
7439-96-5	MANGANESE	50	88	N	50	50	MDE Cleanup Standard									14	
7439-97-6	MERCURY	1.1	1.1	N	2	2	ORNL-R									0.14	J
7440-02-0	NICKEL	73	73	N	NA	73	MDE Cleanup Standard									6.6	U
7440-09-7	POTASSIUM	NA	NA		NA	NA	NA									1200	
7782-49-2	SELENIUM	18	18	N	50	50	ORNL-R									1.6	U
7440-22-4	SILVER	18	18	N	100	100	ORNL-R									1.3	U
7440-23-5	SODIUM	NA	NA		NA	NA	NA									5600	
7440-24-6	STRONTIUM	2200	2200	N	NA	NA	ORNL-R									7.8	
7440-31-5	TIN	2200	2200	N	NA	2200	MDE Cleanup Standard									6.6	U
7440-62-2	VANADIUM	3.7	18	N	NA	3.7	MDE Cleanup Standard									1.6	U
7440-66-6	ZINC	1100	1100	N	5000	5000	ORNL-R									6.6	U
	Volatile Organics (ug/L)																
71-43-2	BENZENE	0.41	0.41	C	5	5	ORNL-R	1	U	1	U	1	U	1	U	1	U
75-15-0	CARBON DISULFIDE	100	100	N	NA	100	MDE Cleanup Standard	1	U	1	U	1	U	1	U	1	U
67-66-3	CHLOROFORM	0.19	0.19	C	80	80	ORNL-R	1	U	1	U	1	U	1	U	1	U
60-29-7	DIETHYL ETHER	NA	NA		NA	NA		1	U	1	U	1	U	1	U	1	U
75-09-2	METHYLENE CHLORIDE	4.8	4.8	C	5	5	ORNL-R	1	U	1	U	1	U	1	U	1	U
108-88-3	TOLUENE	230	230	N	1000	1000	ORNL-R	1	U	1	U	1	U	1	U	1	U

ug/L = micrograms per liter
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 6-7

Tetra Tech NUS,

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: Indian Head Ten Munitions Sites
Project No.: 112G00810
Location: UXO 04 Basic IED Area
Personnel: TtNUS
Weather Conditions:
Measuring Device: Water level indicator
Tidally Influenced: Yes ____ No __x__
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
26MW01/ X04GW001	3/14/2010	1235	10.55	17.31	7.77	NA	2.78	NA
26MW02/ X04GW002	3/14/2010	928	29.14	23.88	4.01	NA	25.13	NA
26MW03/ X04GW003	3/14/2010	1610	34.04	20.25	3.12	NA	30.92	NA

* All measurements to the nearest 0.01 foot

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD/SN_BASIC_IED_MEC.MXD 7/9/10 KM

1245000 1246000 1247000

322000

N

Lewis Road

Archer Avenue

Outer Circle

26MW03

Mixing Area

26SB02

Bleachers

25SB02

26SB04

26MW02

UXO Detector-Aided Sweep
(50-foot line spacing shown)
Follow-up Detector-Aided Sweep
of Selected Anomalies

Observation Area

Detonation
Demonstration
Area

26SB01

26MW01

Planned 100% UXO Detector-Aided Sweep
(5-foot line spacing shown)

Legend

- Monitoring Well
- Soil Boring
- MRP Area Boundary Identified During PA
- Former Ready Bunker Area
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

150 75 0 150
Feet

DRAWN BY	DATE
K. MOORE	10/11/07
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

BASIC IED AREA (UXO-4)
MEC INVESTIGATION LOCATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 6-1	0

1245000 1246000 1247000

P:\GIS\INDIANHEAD_NSWC_NEW\MXD/SN_BASIC_IED_MEC_FINDS.MXD 4/16/10 KM

1245500 1246000 1246500

322500 322000

Archer Avenue

Mixing Area

Bleachers

Observation Area

Detonation Demonstration Area

N

Legend

- Munitions Debris
- MPPEH
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

100 50 0 100 Feet

DRAWN BY	DATE
K. MOORE	1/29/10
CHECKED BY	DATE
E. BERKLITE	3/29/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

BASIC IED AREA (UXO-4)
MEC FINDS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	
N62467-04-D-0055	
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO. FIGURE 6-2	REV 0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD/SN_BASIC_IED_SAMPLING.MXD 7/9/10 KM

1245500 1246000 1246500

322500 322000

N

Archer Avenue

Mixing Area

Bleachers

Observation Area

Detonation Demonstration Area

26MW03 26MW02 26MW01

X04SB001 X04SB002 X04SB003 X04SB004 X04SB005 X04SB006 X04SB007 X04SB008 X04SB009 X04SB010 X04SB011 X04SB012 X04SB013 X04SB014 X04AB015 X04SB016 X04SB017 X04SB018 X04SB019 X04SB020

20 25 30 35 15 10 5 0

Legend

- Soil Sample Location
- Munitions Debris
- MPPEH
- Monitoring Well
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

100 50 0 100 Feet

DRAWN BY	DATE
K. MOORE	1/29/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

BASIC IED AREA (UXO-4)
SAMPLE LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 6-3	0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD/SN_BASIC_IED_SS_TAGS.MXD 7/12/10 KM

1245500 1246000 1246500

322500 322000

X04SB001
Depth = 0.00 - 0.50'
Volatile Organics (ug/kg)
BENZENE 2 [PAL] [MDSGW]
Inorganics (mg/kg)
ALUMINUM 26000 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 16.5 [PAL] [ORNL] [OPLNT]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
ALUMINUM 23600 [BKG] [PAL] [ORNL] [MDRES]
LEAD 122 [BKG] [PAL] [SSL]
LITHIUM 15.2 [PAL] [OPLNT]
POTASSIUM 1570 [BKG]
ZINC 113 [BKG] [PAL] [SSL]

X04SB002
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
CALCIUM 2100 [BKG]
LITHIUM 18.1 [PAL] [ORNL] [OPLNT]
POTASSIUM 1550 [BKG]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
CALCIUM 9230 [BKG]
LITHIUM 18.3 [PAL] [ORNL] [OPLNT]

X04SB003
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LEAD 102 [BKG] [PAL] [SSL]
LITHIUM 18.1 [PAL] [ORNL] [OPLNT]
ZINC 239 [BKG] [PAL] [SSL]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
COPPER 29 [BKG] [PAL] [SSL]
LEAD 94.2 K [BKG] [PAL] [SSL]
LITHIUM 23.7 [PAL] [ORNL] [OPLNT]
POTASSIUM 2020 [BKG]
ZINC 206 [BKG] [PAL] [SSL]

X04SB010
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LITHIUM 20.7 [PAL] [ORNL] [OPLNT]
ZINC 57.1 [BKG] [PAL] [SSL]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
ALUMINUM 20400 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 28.3 [PAL] [ORNL] [OPLNT]
POTASSIUM 2230 [BKG]
TIN 1.7 J [PAL] [BTAG]
ZINC 54.5 [BKG] [PAL] [SSL]

X04SB005
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
ALUMINUM 21200 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 16.8 [PAL] [ORNL] [OPLNT]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
ALUMINUM 24900 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 21.2 [PAL] [ORNL] [OPLNT]
POTASSIUM 1810 [BKG]

X04SB011
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LEAD 119 K [BKG] [PAL] [SSL]
LITHIUM 11.5 [PAL] [OPLNT]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 13.8 [PAL] [OPLNT]

X04SB004
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
ALUMINUM 21700 [BKG] [PAL] [ORNL] [MDRES]
LEAD 85.7 [BKG] [PAL] [SSL]
LITHIUM 13.6 [PAL] [OPLNT]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 17.5 [PAL] [ORNL] [OPLNT]

X04SB006
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
ALUMINUM 20600 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 16.9 [PAL] [ORNL] [OPLNT]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 17.3 [PAL] [ORNL] [OPLNT]
ZINC 47.7 [BKG] [PAL] [SSL]

X04SB013
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LITHIUM 14.1 [PAL] [OPLNT]
POTASSIUM 1590 [BKG]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 14.9 [PAL] [OPLNT]

X04SB012
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
COPPER 44.8 [BKG] [PAL] [SSL]
LITHIUM 19.6 [PAL] [ORNL] [OPLNT]
POTASSIUM 2240 [BKG]
ZINC 55.4 [BKG] [PAL] [SSL]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
COPPER 28.4 [BKG] [PAL] [SSL]
LITHIUM 20.7 [PAL] [ORNL] [OPLNT]
POTASSIUM 2610 [BKG]
ZINC 55.2 [BKG] [PAL] [SSL]

X04SB007
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LITHIUM 12.2 [PAL] [OPLNT]
ZINC 54.1 [BKG] [PAL] [SSL]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 12.4 [PAL] [OPLNT]
ZINC 64.6 [BKG] [PAL] [SSL]
X04SB007 (DUP)
Depth = 0.00 - 2.00'
Volatile Organics (ug/kg)
BENZENE 12.4 J [PAL]
Inorganics (mg/kg)
LITHIUM 14.3 [PAL] [OPLNT]
ZINC 50 [BKG] [PAL] [SSL]

X04SB015
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LITHIUM 19.4 [PAL] [ORNL] [OPLNT]
POTASSIUM 1890 [BKG]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 23.8 [PAL] [ORNL] [OPLNT]
POTASSIUM 2560 [BKG]
ZINC 48.4 [BKG] [PAL] [SSL]

X04SB016
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
ALUMINUM 20400 [BKG] [PAL] [ORNL] [MDRES]
COPPER 89 [BKG] [PAL] [SSL]
LITHIUM 22.9 [PAL] [ORNL] [OPLNT]
POTASSIUM 2070 [BKG]
ZINC 54.5 [BKG] [PAL] [SSL]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
ALUMINUM 19900 [BKG] [PAL] [ORNL] [MDRES]
COPPER 41.2 [BKG] [PAL] [SSL]
LITHIUM 25.7 [PAL] [ORNL] [OPLNT]
POTASSIUM 2720 [BKG]
ZINC 63.9 [BKG] [PAL] [SSL]

X04SB008
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LITHIUM 10.3 J [PAL] [OPLNT]
X04SB008 (DUP)
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LITHIUM 13.1 [PAL] [OPLNT]
ZINC 47.8 [BKG] [PAL] [SSL]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 11.1 [PAL] [OPLNT]

X04SB017
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
COPPER 37.9 [BKG] [PAL] [SSL]
LITHIUM 12.2 [PAL] [OPLNT]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 13.3 [PAL] [OPLNT]

X04SB014
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LITHIUM 15 [PAL] [OPLNT]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 13.8 [PAL] [OPLNT]

X04SB009
Depth = 0.00 - 0.50'
Volatile Organics (ug/kg)
BENZENE 13.5 L [PAL]
Inorganics (mg/kg)
LITHIUM 12.4 [PAL] [OPLNT]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 12.3 [PAL] [OPLNT]
TIN 1.1 J [PAL] [BTAG]

X04SB020
Depth = 0.00 - 0.50'
Inorganics (mg/kg)
LITHIUM 11.8 [PAL] [OPLNT]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 13.4 [PAL] [OPLNT]
POTASSIUM 1660 [BKG]

X04SB018
Depth = 0.00 - 0.50'
Volatile Organics (ug/kg)
BENZENE 3 [PAL] [MDSGW]
Inorganics (mg/kg)
LITHIUM 15.9 [PAL] [OPLNT]
POTASSIUM 1560 [BKG]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
LITHIUM 16.7 [PAL] [ORNL] [OPLNT]
POTASSIUM 1520 [BKG]

X04SB019
Depth = 0.00 - 0.50'
Volatile Organics (ug/kg)
BENZENE 3.5 [PAL] [MDSGW]
Inorganics (mg/kg)
CALCIUM 35900 [BKG]
LITHIUM 4.4 [PAL] [OPLNT]
MERCURY 0.57 J [BKG] [PAL] [BTAG]
NICKEL 63.6 [BKG] [PAL] [SSL]
ZINC 63.4 [BKG] [PAL] [SSL]
Depth = 0.00 - 2.00'
Inorganics (mg/kg)
CALCIUM 11900 [BKG]
COPPER 42.9 [BKG] [PAL] [SSL]
LITHIUM 5.1 [PAL] [OPLNT]
MERCURY 0.52 J [BKG] [PAL] [BTAG]
NICKEL 84.4 [BKG] [PAL] [SSL]

Archer Avenue

Detonation Demonstration Area

N

100 50 0 100 Feet

Legend

- Soil Boring Sample Location
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	6/17/10
CHECKED BY	DATE
E. BERKLITE	7/12/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

BASIC IED AREA (UXO-4)
SURFACE SOIL METALS EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO. FIGURE 6-4	REV 0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD/SN_BASIC_IED_SB_TAGS.MXD 7/12/10 KM

1245500 1246000 1246500

322500 322000

N

Archer Avenue

Detonation Demonstration Area

X04SB001
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 31.5 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 15.3 [PAL] [OPLNT]

X04SB002
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 11.4 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 10.8 [PAL] [OPLNT]

X04SB003
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 13 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 13.3 [PAL] [OPLNT]

X04SB004
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 31.2 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 14.7 [PAL] [OPLNT]

X04SB005
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 9.7 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 15.7 [PAL] [OPLNT]

X04SB006
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 7.9 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
Volatile Organics (ug/kg)
BENZENE 2.8 [PAL] [MDSGW]
Depth = 4.00 - 6.00'
Inorganics (mg/kg)
LITHIUM 14.3 [PAL] [OPLNT]

X04SB007
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 11.8 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 11.8 [PAL] [OPLNT]
X04SB007 (DUP)
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 17.1 [PAL] [ORNL] [OPLNT]

X04SB008
Depth = 2.00 - 4.00'
Volatile Organics (ug/kg)
BENZENE 6.3 [PAL] [MDSGW]
Inorganics (mg/kg)
LITHIUM 16.3 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
Inorganics (mg/kg)
LITHIUM 21.2 [PAL] [ORNL] [OPLNT]

X04SB009
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 13.4 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 20.1 [PAL] [ORNL] [OPLNT]
X04SB009 (DUP)
Inorganics (mg/kg)
LITHIUM 24.4 [PAL] [ORNL] [OPLNT]

X04SB010
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 5 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 15.7 [PAL] [OPLNT]

X04SB011
Depth = 2.00 - 4.00'
Volatile Organics (ug/kg)
BENZENE 5.8 J [PAL] [MDSGW]
Inorganics (mg/kg)
LITHIUM 15.5 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
Inorganics (mg/kg)
LITHIUM 25.6 [PAL] [ORNL] [OPLNT]

X04SB012
Depth = 2.00 - 4.00'
Volatile Organics (ug/kg)
BENZENE 9 [PAL] [MDSGW]
Inorganics (mg/kg)
LITHIUM 29.7 [PAL] [ORNL] [OPLNT]
ZINC 80.5 [BKG] [PAL] [SSL]
Depth = 4.00 - 6.00'
Inorganics (mg/kg)
LITHIUM 17.4 [PAL] [ORNL] [OPLNT]

X04SB013
Depth = 2.00 - 4.00'
Volatile Organics (ug/kg)
BENZENE 2.2 [PAL] [MDSGW]
Inorganics (mg/kg)
LITHIUM 27.8 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
Volatile Organics (ug/kg)
BENZENE 14 [PAL] [MDSGW]
Inorganics (mg/kg)
LITHIUM 14.2 [PAL] [OPLNT]

X04SB015
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 31.6 [PAL] [ORNL] [OPLNT]
ZINC 71.4 [BKG] [PAL] [SSL]
Depth = 4.00 - 6.00'
Volatile Organics (ug/kg)
BENZENE 4.4 [PAL] [MDSGW]
Inorganics (mg/kg)
LITHIUM 24.4 [PAL] [ORNL] [OPLNT]
ZINC 77 [BKG] [PAL] [SSL]

X04SB016
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 27.3 [PAL] [ORNL] [OPLNT]
ZINC 71.5 [BKG] [PAL] [SSL]
Depth = 4.00 - 6.00'
LITHIUM 17.9 [PAL] [ORNL] [OPLNT]

X04SB017
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 18.6 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 12.8 [PAL] [OPLNT]

X04SB014
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 22.6 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 20.6 [PAL] [ORNL] [OPLNT]

X04SB018
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 28.9 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 28.6 [PAL] [ORNL] [OPLNT]

X04SB019
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 23.5 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 24.2 [PAL] [ORNL] [OPLNT]

X04SB020
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 12.5 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 17.6 [PAL] [ORNL] [OPLNT]

Legend

- Soil Boring Sample Location
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

100 50 0 100 Feet

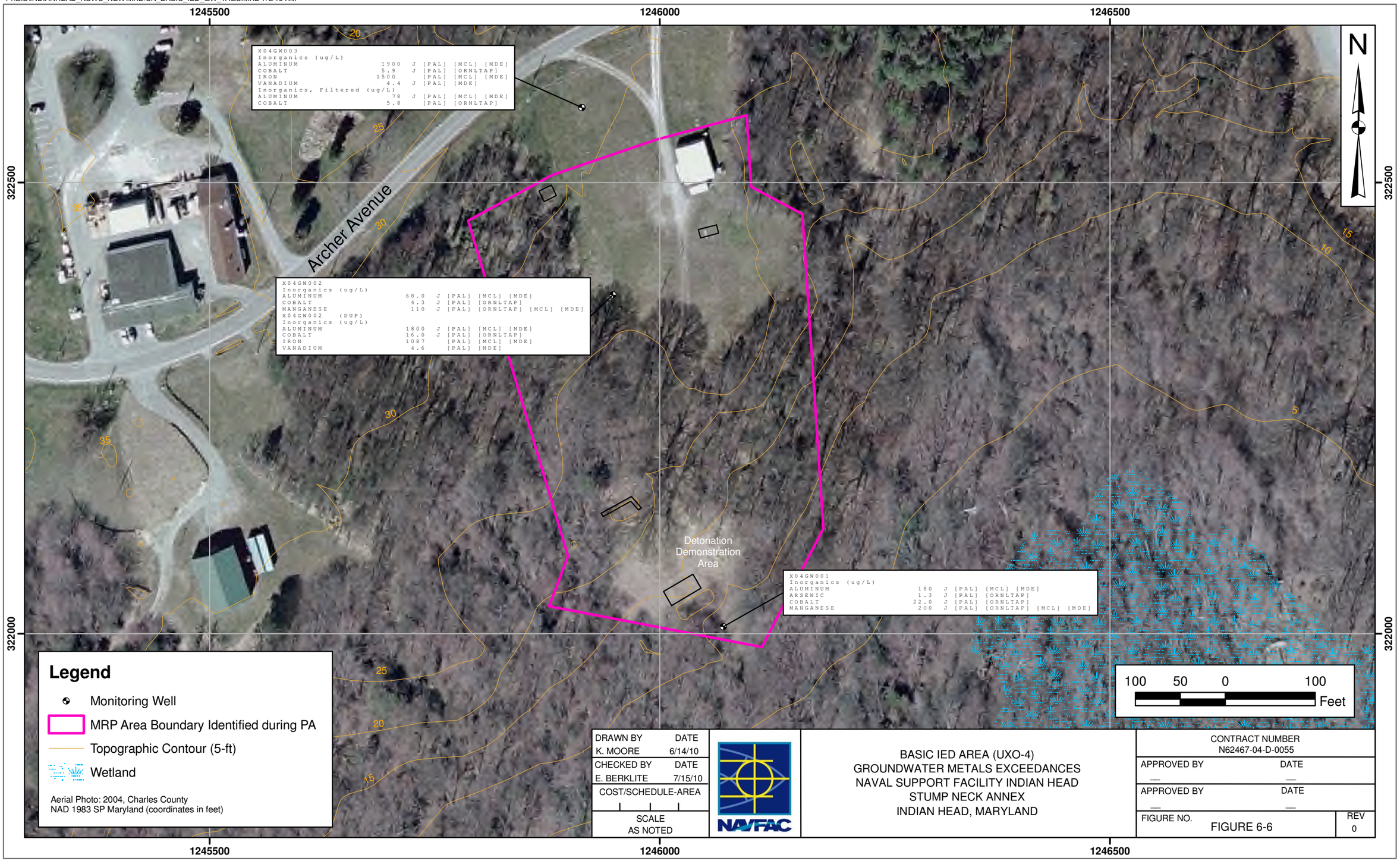
DRAWN BY	DATE
K. MOORE	6/17/10
CHECKED BY	DATE
E. BERKLITE	7/12/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

BASIC IED AREA (UXO-4)
SUBSURFACE SOIL EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 6-5	0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD/SN_BASIC_IED_GW_TAGS.MXD 7/9/10 KM



Legend

- Monitoring Well
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	6/14/10
CHECKED BY	DATE
E. BERKLITE	7/15/10
COST/SCHEDULE-AREA	
SCALE	AS NOTED

NAVFAC

BASIC IED AREA (UXO-4)
GROUNDWATER METALS EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 6-6	0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD/SN_BASIC_IED_POTENTIOMETRIC.MXD 7/9/10 KM

1245500 1246000 1246500

322500 322000

N

Archer Avenue

Mixing Area

Bleachers

Observation Area

Detonation Demonstration Area

26MW03 30.92

26MW02 25.13

26MW01 2.78

X04SB001 X04SB002 X04SB003 X04SB004 X04SB005 X04SB006 X04SB007 X04SB008 X04SB009 X04SB010 X04SB011 X04SB012 X04AB013 X04SB014 X04AB015 X04SB016 X04SB017 X04SB018 X04SB019 X04SB020

Legend

- Soil Sample Location
- Munitions Debris
- MPPEH
- Monitoring Well
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)
- Potentiometric Contour (feet above msl)
- Wetland
- Groundwater Flow Direction

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

100 50 0 100 Feet

DRAWN BY	DATE
K. MOORE	6/22/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

BASIC IED AREA (UXO-4)
GROUNDWATER POTENTIOMETRIC SURFACE MAP
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 6-7	0

LEGEND

MRP AREA BOUNDARY IDENTIFIED DURING PA

WATER TABLE (ESTIMATED)

BUILDINGS

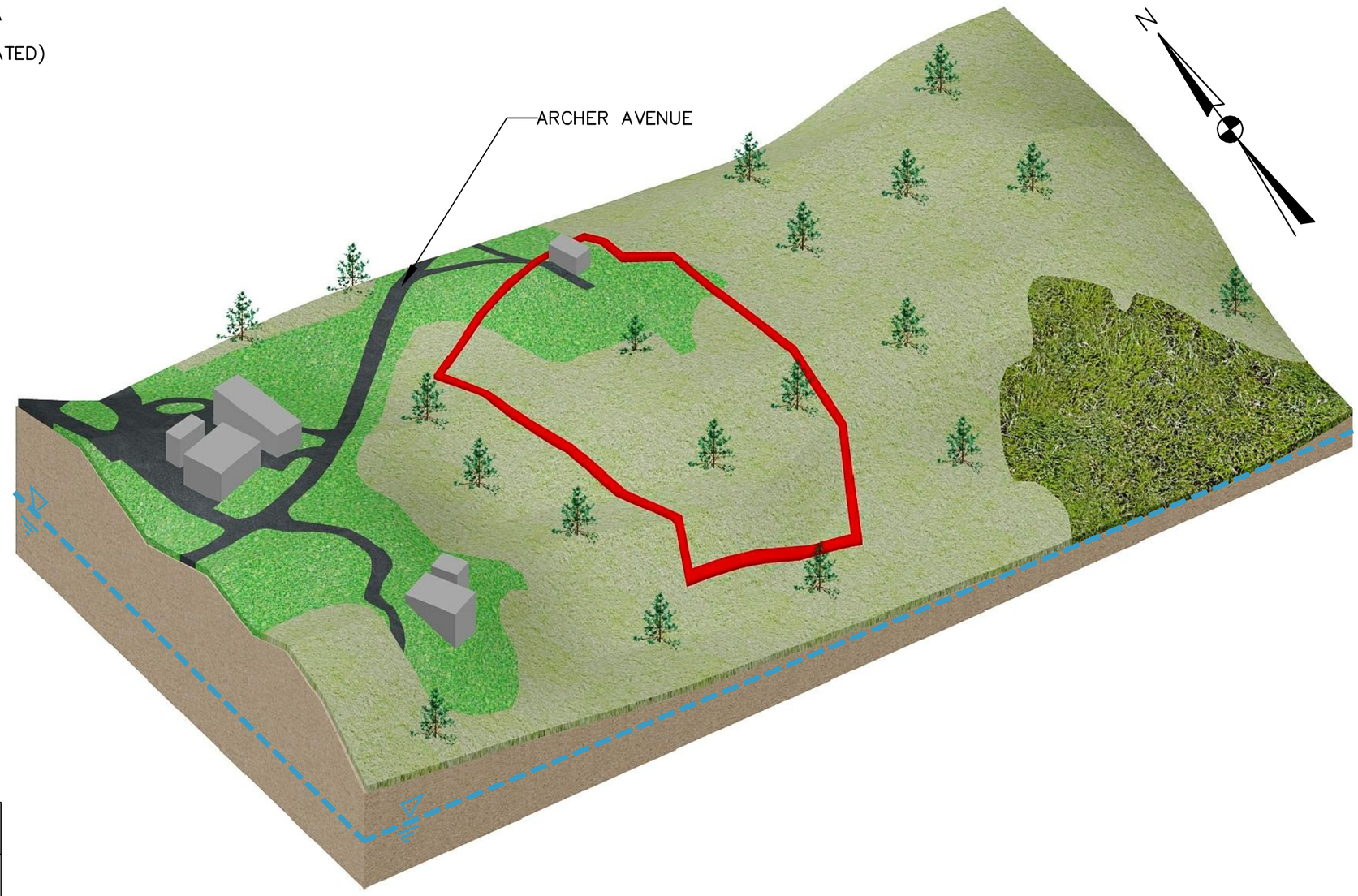
TREE

GRASS

PAVED ROAD

FOREST

WETLANDS



CURRENT AND FUTURE RECEPTORS FOR STUMP NECK IMPACT AREA
HUMAN: –MILITARY/CIVILIAN PERSONNEL –CONTRACTORS –TRESPASSERS
ECOLOGICAL: –PLANTS –INVERTEBRATES –BIRDS –MAMMALS

DRAWN BY ND DATE 6–18–10	NAVFAC	BASIC IED AREA UXO–4 CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND	CONTRACT NO. 0810
CHECKED BY DATE			OWNER NO.
REVISED BY DATE			APPROVED BY DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 6–8 / REV. 0

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FIGURE 6-9A

MEC EXPOSURE PATHWAY ANALYSIS

BASIC IED AREA UXO 04

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

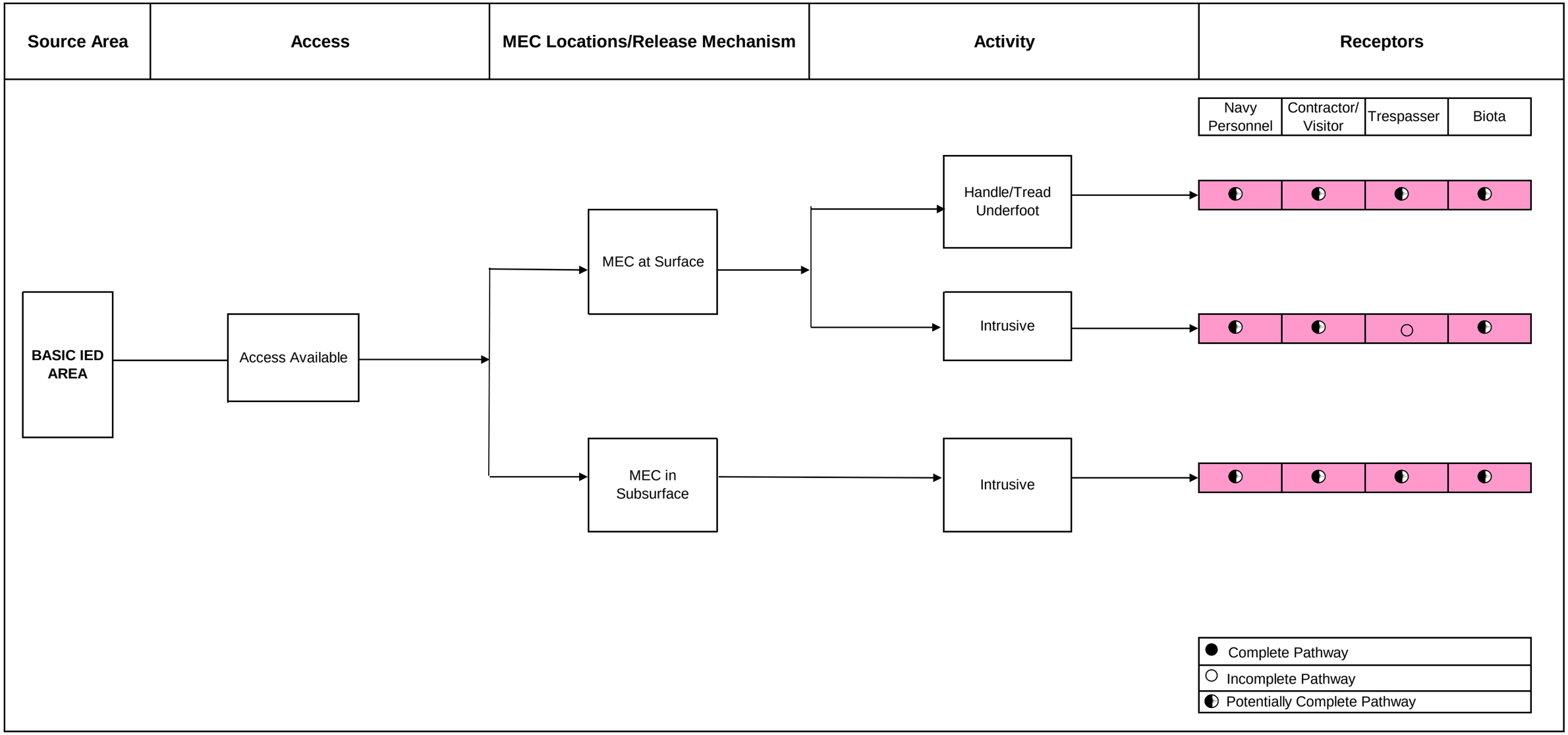
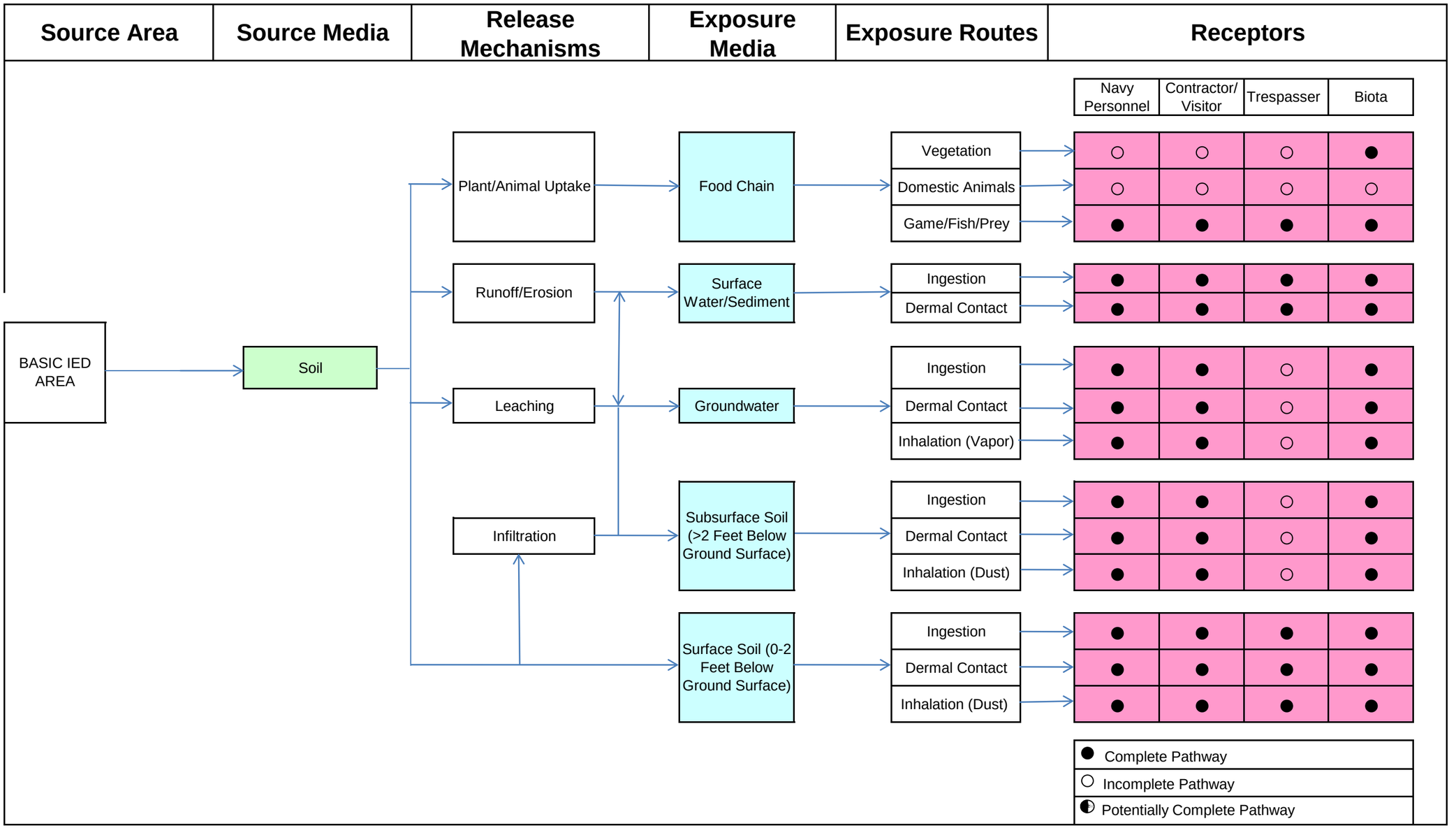


FIGURE 6-9B

MC EXPOSURE PATHWAY ANALYSIS

BASIC IED AREA UXO 04

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



Site Inspection Report
for
Munitions Response Program
MEC and MC Site Inspections at
Ten Munitions Response Ranges

Volume II of II - Sections 7 through 13 and Appendices on CD

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7.0 ADVANCED IED AREA – UXO-5

7.1 LOCATION AND SETTING

The Advanced IED Area, initially identified as the Inert Ordnance Devices (IOD) Area from the Navy's Range Inventory, is a 10.1-acre range located in the western-central portion of Stump Neck Annex, adjacent to Archer Avenue. Parker Road bisects the Advanced IED Area.

AIEDA-1. View of Northern Side of Advanced IED Area

AIEDA-2. View of Southern Side of Advanced IED Area

7.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

There are no buildings located on the Advanced IED Area. Several buildings were located just north of the Advanced IED Area before, during, and after its use by the EOD School, but all buildings have been demolished. The following buildings were identified as being part of the EOD School's Division II Area 1A, including:

- Building 2086SN (used as office/storage/class room space).
- Building 69SN (used as a work shop/publication storage/student coffee mess).
- Building 6SN (used for fuze stripping procedures).
- Building 7SN [used for baltograph (Polaroid)].

Building 6SN was identified in the October 1970 memorandum as part of Division II Area 1A; however, Building 6SN is outside the range boundaries. The Utilities Data Map of the Main Installation indicates that no utilities are present within the boundaries of the Advanced IED Area. Potable water, sewage, and electrical lines run parallel to the northern side of Parker Road but do not occur within the boundaries of the Advanced IED Area. The Advanced IED Area was used by the EOD School for training, and

potentially for the disposal of inert ordnance items and training aids. The area is currently undeveloped and unused. However, the grass covering the Advanced IED Area is mowed regularly. According to the 2003-2004 Stump Neck Annex Hunting Map, hunting is permitted within the Advanced IED Area. Although no changes to the current land use are planned, it is assumed that the Advanced IED Area could potentially be redeveloped in the future.

7.3 TOPOGRAPHY

Elevations across the Advanced IED Area range from 5 to 15 feet above msl, gently sloping from the northwest to the southeast toward a wetland area.

7.4 GEOLOGY

Site-specific geology was classified for the Advanced IED Area during this SI's shallow subsurface boring investigation. The geology observed during boring installation consisted of silty sand with clay. The relative amounts of sand, silt, and clay varied somewhat at each location. In general, the geology graded from a sandy/silty clay to a clayey/silty sand. As described in Section 2.2.3 - Regional Geology, in most of the study area, the surficial sediments consist of Pleistocene paleochannel deposits and Holocene alluvial and paludal deposits (Hiortdahl, 1997). These deposits consist of gravel, sand, silt, clay, and peat mixtures with irregular bedding and with an aggregate thickness of 0 to approximately 40 feet. Groundwater was encountered at the interval of this clayey/silty sand. A hard clay was encountered at the final depth (6 feet bgs) in some of the borings. No waste material was encountered during the shallow surface investigation. Soil and sediment log sheets are included in Appendix F.5. Boring logs are included in Appendix F.1.

7.5 SOIL AND VEGETATION

According to the Soil Survey of Charles County, the predominant soil type associated with the Advanced IED Area is Keyport Silt Loam, moderately eroded, with 2 to 5 percent slopes (USDA, 1974). These soils are characterized by a thin silt loam surface layer or potentially exposed subsoil. These soils have high available moisture content (range) and low permeability (range cm/sec). The Advanced IED Area is a grass-covered area and is mostly surrounded by a mixture of coniferous and deciduous trees. A large wetland lies within approximately 200 feet of the eastern, western, and southern boundaries of the Advanced IED Area.

7.6 HYDROLOGY

Drainage from the Advanced IED Area drains either directly into the wetland areas surrounding the site and then into Chicamuxen Creek, or directly into the creek.

7.7 HYDROGEOLOGY

There is no range-specific hydrogeology information for the Advanced IED Area. Expected flow direction of shallow groundwater based on topographic setting and geology is towards the wetlands.

7.8 WETLANDS

Surface water runoff drains to the wetlands southeast of the range.

7.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

According to the 1996 Phase I Cultural Resources Survey of Stump Neck Annex, there are no archeological/cultural sites within the Advanced IED Area. Several shovel test pits were excavated within the site boundaries, and all were negative for historic artifacts.

7.10 HISTORICAL INFORMATION

The Advanced IED Area was used by the EOD School for training, and may have been used for the disposal of inert ordnance and training aids. An area located within the boundaries of the site, referred to as Solid Waste Management Unit (SWMU) 27, contains a concrete foundation or subgrade concrete bunker in which a variety of reportedly inert submunitions, practice rockets, snake eye fin tubes, smoke canisters, bomb fuzes, and random munitions debris are present. The site was reportedly active from 1953 to 1995 and is a part of the range fan of the Valley Impact Area. In 1995, the EOD School was moved to Eglin AFB. According to Ms. Heidi Morgan, site representative, red flags were posted along the northern and western boundaries of the Advanced IED Area that stated “active explosive operations in progress” , which is consistent with reports that this area was used by the EOD School for training activities. Based on the results of the VI, no further action was recommended for SWMU 27. Currently, the site is defined as a mostly wooded 10-acre parcel. The Advanced IED Area is regarded as a suspected MEC site.

Since the Advanced IED Area is overlapped by the firing fans from the Valley Impact Area located at the Main Installation, there is a potential for munitions associated with the Valley to be present at the

Advanced IED Area. Information on the Valley is provided in Section 12.1. Based on the information obtained during the data collection process, no CWM-filled munitions, or DU associated munitions were found or are expected to be found at the Advanced IED Area. An aircraft fuselage was reportedly located in the area for training exercises to simulate the deactivation of UXO aboard aircraft.

7.11 MUNITIONS USED

Munitions and munitions-related materials known or suspected to be at the range are:

- Dropped munitions
- Fuze stripping
- Tools and methods
- Explosive analysis
- Baltograph (polaroid)
- Accidents/incidents related to dropped munitions
- New innovations

The following inert ordnance and munitions debris items were observed on or near the concrete bunker during the visual survey conducted in June 2003:

- Submunitions (cluster bombs)
- Practice rockets
- Snake eye fin tubes
- Smoke canisters
- Bomb fuzes
- Random munitions debris

7.12 MUNITIONS CONSTITUENTS

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 7-1, and include the following:

- Pentaerythritol tetranitrate.
- 2,4,6-trinitrotoluene.
- Cyclotrimethylenetrinitramine.
- Octogen: a powerful and relatively insensitive nitroamine high explosive, chemically related to RDX.

- White phosphorous or napalm.
- Cyanide.
- Nitrate and nitrite.
- Ammonia.
- NG.
- Nitrocellulose.
- Nitroguanidine.

7.13 PREVIOUS INVESTIGATIONS

Both a human health risk assessment and an ecological risk assessment were conducted for SWMU 27. These risk assessments evaluated chemical constituents, not explosives. Based on the results, contaminants detected at SWMU 27 were unlikely to pose a risk to human health or the environment under current and anticipated future land use scenarios. Therefore, a no further action recommendation was made for SWMU 27. Although the source(s) of methylene chloride and toluene is unknown, they are not likely related to MEC. The elevated metals concentrations may be related to MEC and MEC debris in and around the concrete bunker. Based on the results of these samples collected from SWMU 27, the MC suspected to be present in this area may include inorganics. The concentrations of the inorganics present are not known. The Advanced IED Area is overlapped by the firing fan from the Valley located at the Main Installation. Thus, there is a potential for munitions associated with the Valley to be present at the Advanced IED Area. The primary associated MC for the Advanced IED Area are metals. During the 1996 VI, two surface soil samples (0 to 2 feet bgs) were collected approximately 25 feet south and east of the concrete bunker. The samples were analyzed for VOCs, SVOCs, energetics and Method 8330 explosives, and other parameters. The soil samples had elevated concentrations of methylene chloride, toluene, and several inorganics (antimony, cadmium, calcium, copper, magnesium, tin, and zinc) with respect to background soil levels. The potentially affected medium is soil, and it is believed that the inorganic constituents are derived from the MC debris in and around the concrete bunker. Two subsurface soil samples (0 to 2 feet bgs) were also collected during the VI approximately 25 feet south and east of the concrete bunker. These samples were analyzed for the following:

- VOCs
- SVOCs
- Target Analyte List metals
- Tin
- Cyanide

- TOC
- Nitrate and nitrite
- Ammonia
- NG
- Nitrocellulose
- Nitroguanidine
- PETN
- Method 8330 explosives (including TNT, HMX, and RDX)

No energetics or SVOCs were detected in the samples collected. Elevated levels of methylene chloride, toluene, and several inorganics were detected in soil samples. The inorganics with elevated concentrations (two to five times background levels at the nearby Basic Inert Explosive Devices site) include the following:

- Antimony
- Cadmium
- Calcium
- Copper
- Magnesium
- Tin
- Zinc

7.14 SITE FIELDWORK

7.14.1 Background

The concrete foundation located in the southeastern portion of the site (SWMU 27) was discovered during the PA to contain visible suspect MEC (e.g., submunitions, practice rockets, snake eye fin tubes, smoke canisters, bomb fuzes, and random MD). The area immediately surrounding the foundation may have been used for training with inert explosive devices based on the visible suspect MEC, historical documents indicating that such activity took place at the site, and the characteristics of the landscape features (flat cleared area surrounded by a berm). Based on this information, it is possible that disposal of training items may also have occurred in this area. Therefore, during the SI, a UXO detector-aided sweep (100-percent survey coverage) was conducted within a 200-foot grid surrounding the concrete foundation, and a geophysical investigation was conducted using a 2.5 foot line spacing across the berm and the cleared area enclosed by it. The PA indicated that the site is about 10 acres in size (based on

historical review); therefore, a UXO detector-aided sweep on 50-foot-spaced transects was conducted for the remainder of the site to determine if other suspect metal was present outside the foundation area.

The initial horizontal boundary for the MEC is the boundary of the Advanced IED Area as defined in the PA and shown on Figure 7-1.

The initial vertical boundary for the MEC investigation (detector-aided surface sweeps and geophysical data) was 1 foot bgs within the land area. This area was used for training which did not involve firing projectile-type ordnance items; therefore, ordnance items were not suspected to be found below the 1 foot interval. The Advanced IED Area is overlapped by the firing fan from the Valley Impact Area located at the Main Installation; therefore, there is the potential for munitions associated with the Valley to be present in this area. Data from this investigation were also used in the assessment of impacts from munitions fired from the Valley.

7.14.2 Scope

The scope of survey activities at the Advanced IED Area is summarized as follows (see Figure 7-1).

- Brush and vegetation clearing was necessary to support the detector-aided surface sweeps and geophysical investigation as described in Section 3a.2.3.

- UXO detector-aided surface sweeping to provide 100-percent coverage across a 200-foot grid surrounding the concrete foundation (SWMU 27), and a sweep with 50-foot-spaced transects for the remainder of the 10-acre site (boundary established based on PA).

- Geophysical surveying of the cleared area (2.5-foot survey line spacing) and surrounding berm (5-foot survey line spacing).

- If suspect MEC or subsurface anomaly clusters were detected along the 50-foot-spaced transects, additional detector-aided or geophysical investigation of these areas was conducted to better determine the extent of possible MEC. Investigation was limited to no greater than 100 feet beyond the planned survey boundary, and the distance was determined in the field by the UXO team leader and geophysics team. Notification was given to the UXO Manager and PM prior to starting the above mentioned additional investigation.

- Consulting with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate MC UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH IR Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items left in place were avoided during subsequent geophysical surveying. No MEC items were moved or disturbed during this phase of the project. Surface MD were reported on the log sheets or in the logbook for the site.

7.14.3 Site Preparation

Vegetation clearing activities in the Advanced IED Area began by cutting the majority of the 200-foot grid around the concrete foundation area using a skid steer brush hog. The outer extremes of this area were cut by hand using weed-eaters and chainsaws because of thick vegetation and terrain restrictions. Prior to skid steer cutting operations, stakes were placed to mark the boundaries of the survey area and a visual UXO survey was conducted to identify ground surface ordnance debris for the skid steer to avoid. Transects were installed in the remaining areas. All transects ran thru areas that consisted of large tress and thick vegetation; therefore, transects were cut by hand using weed-eaters and chainsaws. Stakes were placed at each end of the transect line, and a GPS unit was used to create a path. Transects were then cut along the path as straight as possible avoiding trees over 2 inches in diameter.

7.14.4 UXO Detector-Aided Surface Survey

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix E.

A 100 percent detector-aided surface sweep was conducted around SWMU 27 at the location as shown on Figure 7-1. Transects running north-south covered the remainder of the site; the transect lanes were 5 feet in width and spaced 50 feet apart. In total, 19 transects were planned and surveyed. Transects were sequentially numbered from west to east. A 100 percent detector-aided surface sweep was also conducted of accessible areas within 50 feet of any anomaly clusters identified along transects during detector-aided surface sweeps, or during the subsurface geophysical investigation. The sweeps were conducted by UXO Technicians using hand-held metal detectors (Schonstedt or White's). The White's XLT was employed because of the possibility of encountering non-ferrous anomalies associated with IED and demolition training operations (i.e., fuze components, blasting caps, etc.).

The UXO team established a coordinate system for the detector-aided sweeps by creating a labeled system of survey stakes. Metal detectors were used to locate surface metal and debris. The UXO team established 5-foot lanes to survey the 200-foot grid with 100-percent coverage. The 50-foot-spaced transects were established perpendicular to the established baseline using a compass or GPS unit to guide the team on a meandering path (avoiding obstacles, heavy brush, wetlands, etc.) from one end of the site to the other. The general UXO detector-aided survey was conducted as described in Section 3a.3. Locations where visual observations of suspect MEC, MPPEH, MD or subsurface anomalies were observed were marked with a stake. Pictures were taken of items observed on the surface. In clear areas the locations were recorded using a GPS. In areas where tree canopy precluded use of a GPS, locations were established using a tape measure and compass measurements from a known location(s). All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures. The MEC hazard assessment methodology is described in Section 3a.5. MEC documentation is described in Section 3a.7.

7.14.5 Geophysical Survey

Geonics EM61-MK2 and Geometrics G-858G magnetometer surveys were both planned in the grassy portions of the berm area; however, the survey was limited to the use of EM61 in the open area because many surface munitions were discovered during the UXO detector-aided survey, and the Team decided that the field effort required to do both surveys would be too great. The geophysicist conducted a survey of the cleared area (2.5-foot survey line spacing) and surrounding berm (5-foot survey line spacing). GPS data were integrated at 1 second intervals to position the geophysical data. Based on former site usage, it is anticipated that potential target anomalies are shallow (up to 2 feet bgs), except within the berm where items could be as deep as the base of the berm (about 4 to 5 feet). Targets of the geophysical investigation on this site ranged from small to large object sizes, and therefore survey depths varied as well (based on a range of target sizes that potentially included training items as large as bomb or torpedo casings).

Before the geophysical surveys began, the UXO team conducted a visual and detector-aided surface sweep of the survey area. Any suspect MEC found during the surface sweep was flagged by the UXO team and reported, and the geophysical survey team avoided these areas. If, during the geophysical survey additional MEC items were observed, these were marked with engineering flagging tape and given a unique I.D. number by the UXO technician.

7.15 DEVIATIONS FROM WORK PLAN

The UFP SAP called for a magnetometer investigation of the open and bermed area near the concrete foundation. However, in concurrence with the RPM's guidance, the magnetometer investigation was not conducted. Additionally, water was pumped out of the well adjacent to the concrete foundation (SWMU-27). The original plan did not consider the effects of the winter rainy season, and therefore did not plan for any type of pumping. There were no other deviations from the Work Plan during the survey of the Advanced IED Area.

7.16 MEC SURVEY RESULTS

The Field Forms are included in Appendix C, and a summary of the UXO Surface Survey Activities is presented below.

On November 16 and 17, 2009, the boundaries were set for the 100-percent coverage sections at the Advanced IED Area. On November 20 through 22, 2009, brush cutting in the Advanced IED Area 100-percent coverage section was completed. All skid steer brush cutting was completed from November 20 through December 4, 2009. All 19 transects were established and sweep lanes were marked in the Advanced IED Area.

7.16.1 UXO Detector-Aided Surface Survey Results

On December 1, 2009, a Schonstedt sweep was performed on transects 6 through 19 in Advanced IED Area. A White's XLT sweep was performed on transects 15 through 19.

On December 2, 2009, a White's XLT sweep was performed on transects 12 through 14. The Schonstedt and White's surveys were completed on 30 percent of the Advanced IED Area 100-percent coverage section. Water was pumped out of SWMU 27, and numerous MD and potential MEC items were visually located and photographed. Four possible MEC items and eight MD items were located. Classification of items on transects and in the 100-percent coverage section of the Advanced IED Area was ongoing.

During the detector-aided survey of the concrete foundation area performed from December 2 through 6, 2009, there were nine suspect MEC items discovered. The suspect MEC items were marked and reported to the NSF-IH POC. UXO personnel were informed to stay out of the area until a disposition could be made regarding the items. Digital photographs were taken of the items and the GPS location was recorded; upon review of the pictures and closer inspection of the items by the

SUXOS, UXO personnel were still unable to positively identify the hazards associated with the suspect MEC items. Notifications were made concerning this discovery, and the NSF-IH POC was notified of the findings.

During transect sweeps performed from December 3 through 8, 2009 (transects were not surveyed on consecutive days), another nineteen possible MEC items were located. Pictures were taken, the items were logged, and the positions were entered into the GPS. Items were marked and UXO personnel were informed to stay out of the area until a disposition could be made regarding the items. Notifications were made and the NSF-IH POC was notified of the findings.

A Navy EOD team from Dahlgren, Virginia was called to respond to the site on December 8, 2009 for classification determination and removal. The EOD team determined that two items, a M-38 Submunition and 90mm High Explosive Anti-tank (HEAT) round, were hazardous and were blown in place. All other suspect MEC items were classified as munitions debris by the EOD. The EOD team conducted remote movement of several of the items and these items were disposed of on the EOD training range.

The Navy Dahlgren EOD team was also called to respond to the suspect MEC items on December 11, 2009. The EOD team conducted remote movement of several of the items and inspected all suspect MEC items. The team determined that 11 of the items were hazardous but safe to move. The items were disposed of on the EOD training range located on the Stump Neck Annex. The remaining eight suspect MEC items were determined to be munitions debris and were staged by the Navy EOD Technicians next to the concrete foundation (SWMU 27) in an ammo can.

The UXO Survey was completed on December 8, 2009, when the RPM asked that the UXO team stop working in the area after the discovery of 28 MEC and 99 MPPEH items on the surface during detector-aided surface sweeps (Table ES-2). The majority of the items (55) were found in or around the concrete foundation area. Figure 7-2 illustrates the Advanced IED Area MEC/MPPEH Finds Locations and Table 7-2 details the MEC/MPPEH finds. Appendix D presents photographs of the MEC/MPPEH and MD items discovered during the detector-aided surface sweeps.

7.16.2 Geophysical Survey Results

Figure 7-3 displays the interpretation of the site data. Anomalies auto-selected (picked) using the Blakely Test from the UX-Detect module of Geosoft are shown by "+" symbols with a number identifier, and are identified as buried metallic items. Items were picked based on an anomaly amplitude threshold of 5 mV and higher, and 313 items are shown on the figure with their corresponding georeferenced coordinates listed separately in Appendix E, Table 7-3. Although the items are scattered around the site, many tend to be located in clusters. The nature of the buried metallic items cannot be determined from the geophysical data alone, given the site's history of military training and the large quantity of items detected; however, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond.

Aboveground objects displayed in the legend as surface metals (non-munitions related) appear in several locations to create data anomalies. The presence or absence of additional items (and potential targets) in these areas cannot be determined from the geophysical data alone.

7.17 MC SAMPLING PROGRAM

Information from the detector-aided surface sweep about the presence of MD and shallow subsurface anomalies was utilized to identify surface and subsurface MC soil sampling locations, and to determine if contamination exists. Tetra Tech consulted with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate UFP SAP). A total of 100 soil samples was collected at 25 soil sampling locations at the Advanced IED Area. Table 7-3 lists the sampling locations and the justification for selecting the locations.

If no suspect MEC, MPPEH, or subsurface anomaly clusters were observed, the samples were collected at the UFP SAP proposed locations. Because of the numerous MEC finds and subsurface anomalies identified during the MEC investigation, an additional five MC sampling locations were collected beyond the original 20 proposed sampling locations. Figure 7-4 illustrates the sampling locations in conjunction with the MEC detector-aided surface sweep findings at the Advanced IED Area. All soil samples were collected via hand auger and DPT and submitted to the fixed-base laboratory for explosives and metals analyses. Three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis.

The CSM (detailed in Appendix B of Volume I of the UFP SAP) indicated that potentially complete exposure pathways existed for both human and ecological receptors under current and hypothetical

future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist. The updated CSM is included in Section 7.26.

7.17.1 MC Sample Collection and Analysis

Soil sample locations were selected based on a bias towards areas that were believed to be most likely contaminated by past operations at the site. The total area of the site is 10.1 acres as indicated in Table ES-1. See Figure 7-4 for all sample locations. Prior to initiating sample collection, all sample locations were marked by colored pin flags bearing the sample location ID number. Collected sample locations identified in the approved UFP SAP were located by GPS and by measurements from stationary objects (e.g., roadways, existing buildings). All sample locations were as collected as proposed in the approved UFP SAP.

1) **Surface Soil**

a) Fifty composite surface soil samples were collected from two depths (0 to 6 and 0 to 24 inches bgs) at each of the 25 sample locations. The 0- to 6-inch bgs interval is of interest for ecological risk screening while the 0- to 24-inch bgs interval is of interest for the human health risk screening. Surface soil samples at each location sampled were composites of seven discrete samples collected using the seven-point wheel approach. Explosives present on the surface would have resulted from low order detonations which released particles of explosives. These particles would be heterogeneously distributed in surface soil. In order to form a composite in which explosives would be evenly dispersed, the entire composite was processed in the laboratory using the methodology described in Appendix A of SW-846 Method 8330B. This methodology consists of air drying and sieving the entire sample and conducting particle size reduction (grinding) of the entire sample. Surface soil samples were also analyzed for metals using SW 846 Method 6010B/6020A.

b) Surface samples were collected via hand auger.

2) **Subsurface Soil**

a) Fifty discrete subsurface soil samples were collected from two depths (2 to 4 and 4 to 6 feet bgs) at each of the 25 sample locations. All subsurface soil samples were analyzed for explosives (SW 846 Method 8330B) and metals (SW 846 Method 6010B/6020A).

b) Subsurface soils were collected via DPT.

3) Duplicates - Three duplicate surface samples and three duplicate subsurface samples were collected.

Anomaly avoidance techniques were practiced during all sampling operations. Soil sample log sheets are included in Appendix F of this document.

7.18 WORK PLAN DEVIATIONS

Because of the numerous MEC finds and subsurface anomalies identified during the MEC investigation, an additional five MC sampling locations were collected beyond the original 20 proposed sampling locations.

7.19 SITE INSPECTION DATA COLLECTION RESULTS

7.19.1 MC Sampling Results

All soil samples collected were compared to the PALs and background sampling results, and a statistical evaluation was done to compare the background data with the site sampling results. The summary tables of the site background screening and PALs are presented in Appendix H and the MC analytical results are also presented in Appendix H. The data validation reports are presented in Appendix I. The statistical summary and calculations are presented in Appendix J. Table 7-4 summarizes the results as compared to the calculated screening values for explosives and metals in surface soil. Table 7-5 summarizes the results as compared to the calculated screening values for explosives and metals in subsurface soil. The PAL was the reference limit, unless the background and screening calculations exceeded this value. In Tables 7-4 and 7-5, if a parameter had an exceedance of the PAL and background screening values at any sampling point, the parameter is highlighted; individual sample exceedances are also highlighted.

7.20 DATA PRESENTATION/DATA USABILITY

7.20.1 Data Quality Review of Samples at the Advanced IED Area

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for the Advanced IED Area were of acceptable quality for use in decision-making. The review began with data validation, which is a comparison of DQIs

against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as “U,” “J,” “R,” “L,” “K,” or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the DQOs of the project. The DQOs presented in the Munitions Response Program Site Inspections at Ten Munitions Response Program Ranges QAPP (September 2009) were maintained through the course of the sampling event. The Worksheets #19 and #15 of the QAPP present the analytical methods and compounds analyzed.

Table 4 in Appendix I presents all the qualified data and the reason for the data qualification. The rejection of data was not necessary for samples collected at the Advanced IED Area and all data are considered valid for their intended purpose.

The sample collection and laboratory analytical completeness were 100 percent.

The laboratory reported nondetected results down to the laboratory MDL for arsenic and selenium, which did meet the PQLGs. The laboratory MDL for tin also met the PQLG for nondetected results; however, forty-nine out of 100 sample results were diluted because of possible matrix interference, which increased the nondetected reporting limits for tin in the affected samples. The nondetected explosive results for compounds 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, and RDX exceeded the PALs for sample X05SS0150006 because of a dilution for a possible matrix interference. The LQL exceeds the PAL for tin, 1,3-dinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, and RDX in several samples. For comparison to risk screening criteria for COPC selection, one half the laboratory QL was used.

Table 4 in Appendix I shows multiple qualifications for calibration, matrix spike recovery, LCS recovery, hold time, ICP serial dilution, ICP interference, and percent difference between column noncompliances. Data qualified with “K” and “L” qualifiers indicate a high or low directional bias, respectively. There were no quality control deficiencies noted for field accuracy.

Several results for aluminum, calcium, arsenic, potassium, and manganese were qualified because of a field duplicate precision noncompliance. Overall, the field and laboratory precision was acceptable and no data were rejected.

No comparability issues were noted during the data validation process.

Based on field logs indicating the conditions during sample collection and laboratory audits, all reported data are adequately representative of site conditions and intended populations.

7.21 DATA COMPARISON TO PROJECT ACTION LIMITS

Fifty composite surface soil samples (0- to 6-inch and 0- to 24-inch bgs) and fifty discrete subsurface soil samples (2- to 4-feet and 4 to 6 feet bgs) were sent to the FBL for explosives analyses using SW 846 Method 8330B and metals analyses (SW 846 Method 6010B/6020A).

7.21.1 Surface Soil

Table 7-4 summarizes the results as compared to the calculated screening values for explosives and metals in surface soil. Figure 7-5 illustrates the locations of the surface soil exceedances.

The PAL was exceeded for one explosive constituent. Nitroglycerin exceeded the PAL of 0.61 mg/kg (background 95 percent UTL value was NA) at one composite surface soil sampling location, X05SS0150006, at an estimated concentration of 0.94 mg/kg. Nitroglycerin was detected, but not exceeded, at four additional sampling locations. Other explosives constituents detected, but not exceeded, were 2,4-dinitrotoluene at four locations and HMX at two locations.

The PAL and background 95 percent UTL value were exceeded for seven metals constituents:

- Aluminum exceeded the PAL of 7700 mg/kg and background 95 percent UTL value of 19700 mg/kg at three composite surface soil sampling locations: X05SS0020024 at a concentration of 32400 mg/kg, X05SS0040024 at an estimated concentration of 20300 mg/kg, and X05SS0060024 at a concentration of 20600 mg/kg.

- Arsenic exceeded the PAL of 0.026 mg/kg and background 95 percent UTL value of 14.9 mg/kg at one composite surface soil sampling location: X05SS0090024 at a concentration of 15.7 (L) mg/kg.

- Copper exceeded the PAL of 28 mg/kg and background 95 percent UTL value of 20.3 mg/kg at four composite surface soil sampling locations, ranging from a concentration of 35.7 (L) mg/kg to a concentration of 60.1 mg/kg.

- Manganese exceeded the PAL of 160 mg/kg and background 95 percent UTL value of 1390 mg/kg at one composite surface soil sampling location: X05SS0030024 at a concentration of 1700 mg/kg.

- Mercury exceeded the PAL of 0.058 mg/kg and background 95 percent UTL value of 0.16 mg/kg at seven composite surface soil sampling locations, ranging from 0.18 (K) mg/kg to 1.2 mg/kg.

- Nickel exceeded the PAL of 38 mg/kg and background 95 percent UTL value of 15.4 mg/kg at two composite surface soil sampling locations: X05SS0140006 at a concentration of 230 (L) mg/kg, and X05SS01400024 at a concentration of 73 (L) mg/kg.

- Zinc exceeded the PAL of 46 mg/kg and background 95 percent UTL value of 37.5 mg/kg at 12 composite surface soil sampling locations, ranging from 46.6 mg/kg to 73.6 mg/kg.

7.21.2 Subsurface Soil

Table 7-5 summarizes the results as compared to the calculated screening values for explosives and metals in subsurface soil. Figure 7-6 illustrates the locations of the subsurface soil exceedances.

Two explosives constituents were detected in discrete subsurface soil samples at the Advanced IED Area, 2,4-dinitrotoluene was detected at two subsurface soil sampling locations, and nitroglycerin was detected at one subsurface soil sampling location. No explosives exceeded their respective PALs. No other explosives were detected at any discrete subsurface soil sampling locations.

The PAL and background 95 percent UTL value were exceeded for six metals constituents:

- Aluminum exceeded the PAL of 7700 mg/kg and background 95 percent UTL value of 19700 mg/kg at five discrete subsurface soil sampling locations, ranging from 35600 mg/kg to 50800 mg/kg.

- Barium exceeded the PAL of 330 mg/kg and background 95 percent UTL value of 134 mg/kg at one discrete subsurface soil sampling location: X05SB0040406 at a concentration of 354 (L) mg/kg.

- Cadmium exceeded the PAL of 0.36 mg/kg and background 95 percent UTL value of 0.61 mg/kg at one discrete subsurface soil sampling location, X05SB0200406 at an estimated concentration of 8.5 mg/kg.

- Lithium exceeded the PAL of 2 mg/kg (background 95 percent UTL value was NA) at all fifty discrete subsurface soil sampling locations, ranging from a concentration of 7.4 mg/kg, to a concentration of 35.3 mg/kg.

- Tin exceeded the PAL of 0.89 mg/kg (background 95 percent UTL value was NA) at one discrete subsurface soil sampling location: X05SB0040406 at an estimated concentration of 1.5 mg/kg.

- Zinc exceeded the PAL of 46 mg/kg and background 95 percent UTL value of 70.4 mg/kg at one composite surface soil sampling location: X05SB0040406 at a concentration of 78.7 (L) mg/kg.

Three soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

Statistical calculations were performed to evaluate the EPCs as discussed in Section 7.22 and included in Appendix J. These calculations were used to aid in the Human Health Risk Screening, which is included as Section 7.23. The Ecological Screening is included as Section 7.24.

7.21.3 COC, pH, and TOC

One representative soil sample per sampling depth (0 to 2 feet, 2 to 4 feet, and 4 to 6 feet) was shipped to the FBL for CEC, pH, and TOC analyses. CEC was detected at 89 mEq/100 at X05SS0110024, 35.1 mEq/100 at X05SB0020204, and 55.3 mEq/100 at X05SB0020406. PH was detected at 5.42 S.U. at X05SS0110024, 4.8 S.U. at X05SB0020204, and 4.63 S.U. at X05SB0020406. TOC was detected at 4770 mg/kg at X05SS0110024, 2060 mg/kg at X05SB0020204 and 1450 mg/kg at X05SB0020406. There are no PALs for CEC or pH. The surface background TOC is 57,200 mg/kg and the subsurface background TOC is 66,500 mg/kg. Neither value was exceeded. The mobility of metals is influenced by pH and CEC. CEC is a calculated value that is an estimate of the ability of the soil to attract, retain, and exchange cations. Soils with CEC above 10 mEq have a higher clay content and a lower sand content with many positions to hold cations. In general, metal cations are most mobile under acidic conditions, and a pH of 7 is neutral. The pH level in this sample would be considered acidic. The mobility of metals generally increases with decreasing soil pH and CEC. TOC is a measure of the total amount of nonvolatile, volatile, partially volatile, and particulate organic compounds in a sample.

7.22 STATISTICAL EVALUATION

A 95 percent UCL is the upper bound of the associated confidence interval on the mean. Exposure assessment and cleanup decisions in support of U.S. EPA projects are often made based upon the mean concentrations of the contaminants of potential concern. A 95 percent *UCL* of the unknown population arithmetic mean is often used to estimate the EPC term (EPA 1992; EPA 2002). It is, therefore, important

to compute a reliable, conservative, and stable 95 percent *UCL* of the population mean using the available data. There are several methods for calculating 95 percent UCLs depending on the data distribution that can be used to model the sample data and the amount of censoring that is present (percent of non-detected concentrations). For chemicals with maximum concentrations greater than the PAL or 95 percent background UTL, PRO UCL version 4.00.04 was used to calculate the appropriate UCL. Then the UCL was compared to the PAL. If the UCL was less than the PAL, it was determined that the chemical would not pose a risk. if the UCL was greater than the PAL, then it was determined that further evaluations should be conducted. The following values were calculated for UXO-5 subsurface soil.

Parameter	PAL (mg/kg)	Background	Maximum Concentration	EPC (mg/kg)
UXO SURFACE				
ALUMINUM	7700	35400	**50800**	26413
BARIUM	330	134	**354**	85.7
CADMIUM	0.36	0.61	**8.5**	**1.3**
LITHIUM	2	NA	**41**	**21.8**
TIN	0.89	NA	**1.5**	**1.5**(0)
ZINC	46	70.4	**78.7**	45.4
UXO SUBSURFACE				
ALUMINUM	7700	35400	**50800**	26413
BARIUM	330	134	**354**	85.7
CADMIUM	0.36	0.61	**8.5**	**1.3**
LITHIUM	2	NA	**41**	**21.8**
TIN	0.89	NA	**1.5**	**1.5**(2)
ZINC	46	70.4	**78.7**	45.4

The bolded cells indicate that UCL exceeds PAL and the background concentration.

7.23 HUMAN HEALTH RISK SCREENING EVALUATION

Surface soil samples at UXO 5 were analyzed for explosives and inorganics. Three explosives and 25 inorganics were detected in the 49 surface soil samples collected at UXO 5. A comparison of the detected subsurface soil concentrations to screening levels is presented in Table 7-5. Aluminum, arsenic, manganese, and nickel were the only chemicals detected at concentrations exceeding the direct contact human health screening levels.

ICLR and HIs were estimated as shown on Appendix K Tables 7-11a and 7-12a. ILCRs for residential (ILCR = 1 x 10^{-5}) and industrial (ILCR = 3 x 10^{-6}) exposed to subsurface soil are within USEPA's target risk range of 10^{-4} to 10^{-6}. The HIs for residential (HI = 0.7) and industrial (HI = 0.2) exposed to subsurface soil are less than the acceptable level of 1 indicating that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions.

Subsurface soil samples at UXO 5 were analyzed for explosives and inorganics. Two explosives and 21 inorganics were detected in the 50 subsurface soil samples collected at -5. A comparison of the detected subsurface soil concentrations to screening levels is presented in Appendix K Table 7-5. Aluminum, cadmium, and lithium were the only chemicals detected at concentrations exceeding the direct contact human health screening levels.

ILCRs and HIs were estimated as shown on Appendix K Tables 7-11b and 7-12b. ILCRs for residential (ILCR = 7 x 10^{-10}) and industrial (ILCR = 1 x 10^{-10}) exposures to subsurface soil are less than USEPA's target risk range of 10^{-4} to 10^{-6}. The HIs for residential (HI = 0.5) and industrial (HI = 0.04) exposures to subsurface soil are less than the acceptable level of 1 indicating that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions.

7.24 ECOLOGICAL RISK SCREENING EVALUTION

7.24.1 COPC Selection

Maximum chemical concentrations in surface soil were compared to the 95 percent UTL background concentration for NSF Indian Head (if available) and ecological screening levels for soil invertebrates, terrestrial plants, birds, and mammals. Chemicals were selected as COPCs for soil invertebrates or plants if the maximum concentration exceeded both the background concentration (if available) and the screening level, or if a screening level was not available for that receptor. The screening levels are provided in Appendix L, Background and Calculations. Frequency of detection tables (fod) are also included in Appendix L.

Appendix L Table 7-1 also presents the chemicals selected for food chain modeling. Food chain modeling was conducted if the maximum detected concentration for a chemical exceeded the avian or mammal screening level. Food chain modeling was not conducted for chemicals without avian or mammal screening levels, unless the chemical was considered an important bioaccumulative chemical (USEPA, 2006), or for chemicals detected at a maximum concentration less than the 95 percent UTL background concentration for NSF Indian Head (if available).

COPCs for Terrestrial Invertebrates and Plants

Appendix L Table 7-1 presents the results of the initial COPC selection for soil invertebrates and plants from surface soil at UXO 5. This table also presents the chemicals that were retained for food chain modeling for mammals and birds (discussed below).

Soil Invertebrates

Three explosives (2,4-dinitrotoluene, HMX, and nitroglycerin) were initially retained as COPCs for soil invertebrates because a screening level was not available. One inorganic (lithium) was initially retained as a COPC for soil invertebrates because a screening level was not available.

Terrestrial Plants

Three explosives (2,4-dinitrotoluene, HMX, and nitroglycerin) were initially retained as COPCs for terrestrial plants because a screening level was not available. Two inorganics (lithium and nickel) were initially retained as COPCs for soil invertebrates because a screening level was not available or the maximum concentration exceeded the screening level.

COPCs for Terrestrial Wildlife

Appendix L Table 7-2 summarizes the results of the conservative food chain modeling for terrestrial receptors, which uses very conservative exposure assumptions. Appendix K presents the calculation worksheets.

Appendix L Table 7-2 lists chemicals selected for food chain modeling. Appendix K Table 7-2 summarizes EEQs for the conservative food chain model. Appendix K contains spreadsheets with EEQ calculations for each receptor. A chemical was initially retained as a COPC if the calculated NOAEL EEQ was greater than 1.0 for any receptor. Three metals were initially retained as COPCs for wildlife: copper, mercury, and nickel.

7.24.2 Step 3A Refinement

This section presents the Step 3A refinement for chemicals that were selected as COPCs in the screening step.

Soil Invertebrates and Terrestrial Plants

2,4-Dinitrotoluene, nitroglycerin, and HMX were retained as COPCs for soil invertebrates and terrestrial plants because a screening level was not available for these explosive constituents. Alternate benchmarks are not available for 2,4-dinitrotoluene and nitroglycerin for either receptor and are discussed qualitatively. 2,4-Dinitrotoluene was detected in only 1 of the 25 samples collected at 0 to 6 inches ecological level of interest, at a relatively low concentration of 0.25 mg/kg. Nitroglycerin was detected in only 4 of 25 samples at a relatively low maximum concentration of 0.94 mg/kg. The Los Alamos National Laboratory (LANL) Ecorisk Database Release 2.4 (December 2009) lists an alternate benchmark for HMX of 140 mg/kg for soil invertebrates and 2700 mg/kg for terrestrial plants. The maximum detected HMX concentration (18.3 mg/kg) is much less than either of these benchmarks. Therefore, 2,4-dinitrotoluene, nitroglycerin, and HMX are not expected to impact soil invertebrates or terrestrial plants.

Lithium was retained as a COPC for plants because the maximum detected concentration exceeded the screening level of 2 mg/kg. Screening criteria or alternate benchmarks are not available for soil invertebrates. The screening level for plants (Efroymson et al., 1996) is based on an unspecified phytotoxic effect from the addition of a lithium salt which increases toxicity and likely overestimates exposure as compared to naturally occurring lithium. Additionally, lithium is not expected to be site-related and the detected concentrations were less than typical nationwide background concentration of 20 mg/kg (Buchman, 2008). Therefore, lithium is not retained as a COPC for soil invertebrates or terrestrial plants.

Nickel was retained as a COPC for terrestrial plants because the maximum detected concentration (230 mg/kg) exceeded the screening level (38 mg/kg). Only the maximum detected concentration exceeds this screening level. Therefore, impacts from nickel are expected to be minimal, and nickel is not retained as a COPC for terrestrial plants.

Mammals and Birds

The EEQs from the terrestrial food chain modeling were greater than 1.0 for copper, mercury, and nickel using maximum chemical concentrations and conservative exposure assumptions. Therefore, as part of the Step 3a refinement, risks for this pathway were recalculated using average chemical concentrations in surface soil and less conservative exposure assumptions (i.e., average ingestion rates, average body weights).

Appendix L Table 7-3 summarizes the results of the less conservative food chain modeling for terrestrial receptors. Appendix K also presents the calculation worksheets. Appendix L Table 7-3 only presents the results of the food chain modeling for the chemicals that were evaluated as part of the Step 3A evaluation. Nickel had a NOAEL EEQ only slightly greater than 1 for the shrew (1.2) and is not expected to pose a significant risk. Therefore, nickel is eliminated as a COPC for terrestrial wildlife. Mercury had NOAEL EEQs greater than 1 for the quail (1.9), robin (13), and the shrew (1.6). The average mercury concentration in UXO-5 surface soil (0.147 mg/kg) used for the Step 3A food chain model is less than the representative Indian Head background surface soil concentration of 0.16 mg/kg. This background concentration would produce a risk to these receptors slightly greater than the risk from surface soil at UXO-5. Therefore, because the average site concentrations used in the food chain models were less than the background concentration, significant site-related risks to these receptors are not expected. Therefore, mercury is eliminated as a COPC for risks to birds and mammals.

7.24.3 Ecological Risk Screening Summary

Initially, three explosives and one inorganic were retained as COPCs for further evaluation for soil invertebrates; three explosives and two inorganics were retained as COPCs for further evaluation for terrestrial plants; and three metals were retained as COPCs for further evaluation for terrestrial wildlife. After the Step 3A refinement, no chemicals were retained as COPCs for ecological receptors from detected concentrations of chemicals in surface soil at UXO-5.

7.26 UPDATED CONCEPTUAL SITE MODEL

A three dimensional depiction of the Advanced IED Area is provided as Figure 7-7. One pathway is runoff from precipitation. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil, soil, and sediment. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses. Only MC associated with Advanced IED Area are considered in the CSM exposure pathway analysis.

7.27 EXPOSURE PATHWAY ANALYSES

This general description of the CSM exposure pathway analysis was included in Section 10.5.11 of the SAP : “The following CSM exposure pathways analysis focuses only on the Advanced IED Area and does not consider impacts from the Valley firing fan. The MEC Exposure Pathway Analysis (Figure 7-8A) illustrates that based on the discovery of 28 MEC and 99 MPPEH (further investigation was halted) and 313 subsurface anomaly items during MEC survey activities, complete pathways exist for human and ecological receptors for MEC in surface soil at the Advanced IED Area. This includes receptors for

hand/tread underfoot contact and surface intrusive work that may be conducted at the site. These activities include, but are not limited to, excavation, plowing, tilling, construction, and environmental sampling for human receptors. Ecological receptors may come in contact with MEC through burrowing, nesting, or feeding activities that disturb surface soil. Trespassers are anticipated to be exposed via non-intrusive surface soil activities at the range, but it is unlikely they would be exposed to subsurface soil through intrusive activities. MEC are not expected in the subsurface." As illustrated in the MC Exposure Pathway Analysis, Figure 7-8B, soil impacted by MC represents a primary source medium. Based on the detections of explosives and inorganics during the MC sampling investigation, surface soil, subsurface soil, and surface water runoff containing MC present complete pathways for human and ecological receptors. All human and ecological receptors have complete exposure pathways for direct contact with MC in surface soil, which includes dermal contact, ingestion, and inhalation (dust). Although there are no surface water bodies within the Advanced IED Area, a large wetland lies within approximately 200 feet of the eastern, western, and southern boundaries of the range, providing an exposure medium for receptors. Thus, surface water runoff is a complete exposure pathway for all receptors (human and ecological) at the Advanced IED Area. Because the range is located in an upland hunting area, human and ecological receptors have a potentially complete pathway by ingesting game/prey that previously consumed contaminated vegetation or prey. Precipitation infiltration may provide for MC mobility to subsurface soil and the shallow surficial aquifer, which is assumed to be connected to nearby surface water bodies. Complete exposure pathways exist for MC in subsurface soil (direct contact, ingestion and inhalation during intrusive work activities) for all human and ecological receptors with the exception of trespassers. It is not anticipated that trespassers would come in contact with subsurface soil. Surficial groundwater in the area is not used, and confining layers are expected to prevent the migration of MC to the lower aquifers used for water supply. Therefore, exposure to human receptors and biota are incomplete pathways for groundwater.

7.28 CONCLUSIONS

- Potable water, sewage, and electrical lines run parallel to the northern side of Parker Road but do not occur within the boundaries of the Advanced IED Area. The Advanced IED Area was used by the EOD School for training, and potentially for the disposal of inert ordnance items and training aids. The area is currently undeveloped and unused. However, the grass covering the Advanced IED Area is mowed regularly. According to the 2003-2004 Stump Neck Annex Hunting Map, hunting is permitted within the Advanced IED Area. The anticipated and potential future activities at the range/site include continued training and operations, and construction, maintenance, and operations related to any future development. Although no changes to the current land use are planned, it is assumed that the Advanced IED Area could potentially be redeveloped in the future.

- The Advanced IED Area is overlapped by the firing fans from the Valley Impact Area located at the Main Installation. Thus, there is a potential for munitions associated with the Valley to be present at the Advanced IED Area. An aircraft fuselage was reportedly located in the area for training exercises to simulate the deactivation of UXO aboard aircraft. The Advanced IED Area includes SWMU 27, which was used by the EOD School for training and to dispose of inert ordnance items and training aids.

- The RPM asked that the UXO team stop working the area after the discovery of 28 MEC and 99 MPPEH items on the surface during detector-aided surface sweeps of the Advanced IED Area. The EOD team determined that 11 of the items were hazardous but safe to move.

- Three hundred-thirteen anomaly items were identified during the geophysical survey. Although the items are scattered around the site, many tend to be located in clusters. The nature of the buried metallic items cannot be determined from the geophysical data alone, given the site's history of military training and the large quantity of items detected; however, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond.

- The PAL was exceeded for one explosive constituent. Nitroglycerin exceeded the PAL of 0.61 mg/kg (background 95 percent UTL value was NA) at one composite surface soil sampling location, X05SS0150006, at an estimated concentration of 0.94 mg/kg. Nitroglycerin was detected, but not exceeded, at four additional sampling locations. Other explosives constituents detected, but not exceeded, were 2,4-dinitrotoluene at four locations and HMX at two locations.

- The PAL and background 95 percent UTL value were exceeded for seven metals constituents:

- Surface soil samples at UXO 5 were analyzed for explosives and inorganics. Three explosives and 25 inorganics were detected in the 49 surface soil samples collected at UXO 5. Aluminum, arsenic, manganese, and nickel were the only chemicals detected at concentrations exceeding the direct contact human health screening levels.

  The HIs for residential (HI = 0.7) and industrial (HI = 0.2) exposed to subsurface soil are less than the acceptable level of 1 indicating that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions.

- Subsurface soil samples at UXO-5 were analyzed for explosives and inorganics. Two explosives and 21 inorganics were detected in the 50 subsurface soil samples collected at UXO-5. Aluminum, cadmium, and lithium were the only chemicals detected at concentrations exceeding the direct contact human health screening levels. The HIs for residential (HI = 0.5) and industrial (HI = 0.04) exposures to subsurface soil are less than the acceptable level of 1 indicating that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions.

- For the initial ecological assessment three explosives and one inorganic were retained as COPCs for further evaluation for soil invertebrates; three explosives and two inorganics were retained as COPCs for further evaluation for terrestrial plants; and three metals were retained as COPCs for further evaluation for terrestrial wildlife. After the Step 3A refinement, no chemicals were retained as COPCs for ecological receptors from detected concentrations of chemicals in surface soil at UXO 5.

- The CSM (Figure 7-7) and Exposure Pathway Analyses (Figure 7-8A and 7-8B) indicate that complete MEC and MC exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses. Currently acceptable levels of human and/or ecological risk exist. Groundwater is not currently used at the site.

7.28.1 Data Gaps

There were no data gaps.

7.29 RECOMMENDATIONS FOR NEXT PHASE

Although the human health and ecological screenings did not retain any COPCs related to human exposures or ecological receptors from detected concentrations of chemicals in surface soil at UXO-5, 28 MEC and 99 MPPEH items were found on the surface during detector-aided surface sweeps, 11 of which the EOD team determined were hazardous. The anticipated and potential future activities at the range/site include continued training and operations, and construction, maintenance, and operations related to any future development. Considerations should be given to the anticipated future land use in regards to the potential presence of MEC.

Although the nature of the buried ferrous metallic items cannot be determined from the geophysical data alone, given the site's potential for discarded munitions or military training equipment, it can be reasoned

that there is at least the potential for buried caches of torpedo casings, MEC or military training equipment. The nature of these buried metallic items cannot be determined from the geophysical data, and can only be characterized through intrusive investigation. Based on these results, a more extensive evaluation, in the form of an RI, is recommended for UXO-5, focusing mainly in the eastern side of the site. The scope of effort for the RI, which will include further characterization, delineation, and intrusive investigations, will be determined during project planning.

MEC

Proceed to an RI. The RI should include:

- Clearance of surface MEC/MPPEH and non-munition debris.
- Subsurface geophysical investigation.
- Investigation of representative subset of subsurface anomaly discovered during the geophysical investigation.

MC

- No further action is recommended, however MC sampling if subsurface MEC/MPPEH are found.

TABLE 7-1

MUNITION TYPES AND CHEMICALS
ADVANCED IED AREA - UXO 05
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MUNITIONS TYPES USED/STORED AT THE FACILITY	ASSOCIATED CHEMICAL CONSTITUENTS
PETN	Pentaerythritol tetranitrate
TNT	2,4,6-trinitrotoluene
RDX	Cyclotrimethylenetrinitramine
HMX	Octogen: a powerful and relatively insensitive nitroamine high explosive, chemically related to RDX
Submunitions (cluster bombs)	White phosphorous or napalm
Random munitions debris:	
Practice rockets, Snake eye fin tubes, Smoke canisters, Bomb fuzes	Metals
	Additional chemicals used:
	Cyanide, Nitrate and nitrite, Ammonia, NG, Nitrocellulose, Nitroguanidine

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 7-2

ADVANCED IED AREA
MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

FACILITY	Stump Neck Annex of Indian Head MD
SITE NUMBER & NAME	112G00810 MMRP Site Investigation

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition			Notifications Completed (indicate w/ √ as applicable)	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
12/02/2009	1041	AIEDA 100%	AIEDA-01		X		321404.73	1245214.35	HEAT, 90mm	Fired or staged to appear fired,	X		12/08/2009	X	AIEDA-01
12/02/2009	1104	AIEDA 100%	AIEDA-02			X	321339.18	1245209.06	Incendiary, AN-M69	Bomblet, rusted, damaged, empty.			12/08/2009	X	AIEDA-02
12/02/2009	1104	AIEDA 100%	AIEDA-03			X	321340.80	1245208.81	Incendiary, AN-M69	Bomblet, rusted, damaged, empty.			12/08/2009	X	AIEDA-03
12/02/2009	1105	AIEDA 100%	AIEDA -04			X	321340.80	1245208.81	Mortar, ejection	Rusted, empty, fired			12/08/2009	X	AIEDA-04
12/02/2009	1113	AIEDA 100%	AIEDA-05		X		321329.30	1245224.38	Bomb fuze	Aluminum, possibly containing			12/11/2009	X	AIEDA-05
12/02/2009	1135	AIEDA 100%	AIEDA-06		X		321322.01	1245195.15	Bomblet, BLU-3	Good condition, probably staged,			12/08/2009	X	AIEDA-06
12/02/2009	1140	AIEDA 100%	AIEDA-07			X	321340.80	1245208.81	Submunition, BLU-7	Aluminum, empty, marked "inert"			12/08/2009	X	AIEDA-07
12/02/2009	1142	AIEDA 100%	AIEDA-08		X		321345.94	1245202.67	Submunition, M-38	Good condition, probably staged,	X		12/08/2009	X	AIEDA-08
12/02/2009	1146	AIEDA 100%	AIEDA-09			X	321351.06	1245194.70	Base, snake-eye fins	Partial assembly, broken			12/08/2009	X	AIEDA-09
12/02/2009	1148	AIEDA 100%	AIEDA-10			X	321348.29	1245193.46	Booster cup, fuze	Empty			12/08/2009	X	AIEDA-10
12/02/2009	1150	AIEDA 100%	AIEDA-11			X	321351.86	1245192.67	Projectile, 5”	Empty, no fuze, unfired			12/08/2009	X	AIEDA-11
12/02/2009	1151	AIEDA 100%	AIEDA-12			X	321354.99	1245196.49	Nose-plug, projectile	Rusted. Located next to the 5"			12/08/2009	X	AIEDA-12
12/06/2009	0846	AIEDA 100%	AIEDA-13		X		321439.76	1245274.92	M-100 series fuze parts	Rusted, parts			12/11/2009	X	AIEDA-13
12/06/2009	0850	AIEDA 100%	AIEDA-14			X	321346.11	1245274.92	M-130 series bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-14
12/06/2009	0852	AIEDA 100%	AIEDA-15			X	321352.66	1245255.07	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-15
12/06/2009	0854	AIEDA 100%	AIEDA-16			X	321347.17	1245242.63	M-130 series bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-16
12/06/2009	0858	AIEDA 100%	AIEDA-17			X	321321.49	1245234.82	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-17
12/06/2009	0900	AIEDA 100%	AIEDA-18			X	321337.49	1245226.23	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-18
12/06/2009	0902	AIEDA 100%	AIEDA-19		X		321340.95	1245220.66	Submunition,BLU-7	Aluminum, possble MEC			12/08/2009	X	AIEDA-19
12/06/2009	0906	AIEDA 100%	AIEDA-20			X	321342.50	1245233.06	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-20

TABLE 7-2

ADVANCED IED AREA
MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
PAGE 2 OF 6

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition			Notifications Completed (indicate w/ √ as applicable)	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
12/06/2009	0908	AIEDA 100%	AIEDA-21			X	321330.05	1245234.22	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-21
12/06/2009	0909	AIEDA 100%	AIEDA-22			X	321326.54	1245223.87	M-905 bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-22
12/06/2009	0912	AIEDA 100%	AIEDA-23			X	321330.32	1245214.84	Unknown, fragment	Rusted, parts			12/08/2009	X	AIEDA-23
12/06/2009	0914	AIEDA 100%	AIEDA-24			X	321331.55	1245218.47	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-24
12/06/2009	0916	AIEDA 100%	AIEDA-25			X	321341.30	1245198.19	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-25
12/06/2009	0919	AIEDA 100%	AIEDA-26			X	321344.17	1245188.55	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-26
12/06/2009	0921	AIEDA 100%	AIEDA-27		X		321356.89	1245194.75	Submunition, BLU-7	Aluminum, possble MEC			12/08/2009	X	AIEDA-27
12/06/2009	0921	AIEDA 100%	AIEDA-28		X		321356.89	1245194.75	Submunition, BLU-7	Aluminum, possble MEC			12/08/2009	X	AIEDA-28
12/06/2009	0924	AIEDA 100%	AIEDA-29			X	321362.21	1245209.00	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-29
12/06/2009	0925	AIEDA 100%	AIEDA-30			X	321357.98	1245218.48	Fuze parts	Rusted, parts			12/08/2009	X	AIEDA-30
12/06/2009	0926	AIEDA 100%	AIEDA-31			X	321365.58	1245225.13	Fuze parts	Rusted, parts			12/08/2009	X	AIEDA-31
12/06/2009	0930	AIEDA 100%	AIEDA-32			X	321344.10	1245173.15	Fuze parts	Rusted, parts			12/08/2009	X	AIEDA-32
12/06/2009	0932	AIEDA 100%	AIEDA-33			X	321339.17	1245178.35	Unknown component	Aluminum			12/08/2009	X	AIEDA-33
12/06/2009	0934	AIEDA 100%	AIEDA-34			X	321307.47	1245189.95	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-34
12/06/2009	0938	AIEDA 100%	AIEDA-35			X	321308.37	1245142.24	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-35
12/06/2009	1001	AIEDA 100%	AIEDA-36			X	321488.59	1245143.03	Fuze vanes	Rusted, partially buried			12/08/2009	X	AIEDA-36
12/06/2009	1003	AIEDA 100%	AIEDA-37			X	321468.03	1245124.12	Rocket motor, empty	Ferrous metal, rusted			12/08/2009	X	AIEDA-37
12/06/2009	1006	AIEDA 100%	AIEDA-38			X	321459.58	1245117.33	Chaff dispenser	partially burned, not in a metal			12/08/2009	X	AIEDA-38
12/06/2009	1009	AIEDA 100%	AIEDA-39			X	321443.26	1245096.86	Striker plate, BLU-3	Good condition			12/08/2009	X	AIEDA-39
12/06/2009	1014	AIEDA 100%	AIEDA-40			X	321325.89	1245089.32	Fuze parts	Rusted, partially buried			12/08/2009	X	AIEDA-40
12/06/2009	1017	AIEDA 100%	AIEDA-41			X	321311.77	1245052.17	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-41
12/06/2009	1018	AIEDA 100%	AIEDA-42			X	321316.44	1245031.23	M-904 series bomb fuze parts	Aluminum, fragment			12/08/2009	X	AIEDA-42
12/06/2009	1020	AIEDA 100%	AIEDA-43			X	321331.25	1245055.27	M-904 series bomb fuze vanes	Rusted, partially buried			12/08/2009	X	AIEDA-43

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				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
12/06/2009	1022	AIEDA 100%	AIEDA-44			X	321327.62	1245040.20	M-100 series fuze parts	Rusted, partially buried			12/08/2009	X	AIEDA-44
12/06/2009	1023	AIEDA 100%	AIEDA-45			X	321362.46	1245036.56	M-100 series fuze parts	Rusted, partially buried			12/08/2009	X	AIEDA-45
12/06/2009	1024	AIEDA 100%	AIEDA-46			X	321358.62	1245035.49	M-100 series fuze parts	Rusted, partially buried			12/08/2009	X	AIEDA-46
12/06/2009	1032	AIEDA 100%	AIEDA-47			X	321359.84	1245039.40	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-47
12/06/2009	1033	AIEDA 100%	AIEDA-48			X	321373.23	1245041.37	Fuze parts	Rusted, parts			12/08/2009	X	AIEDA-48
12/06/2009	1034	AIEDA 100%	AIEDA-49			X	321381.78	1245047.67	Fuze parts	Rusted, parts			12/08/2009	X	AIEDA-49
12/06/2009	1035	AIEDA 100%	AIEDA-50			X	321423.55	1245047.18	M-103 series bomb fuze parts	Non-Ferrous metal, pitted			12/08/2009	X	AIEDA-50
12/06/2009	1041	AIEDA 100%	AIEDA-51			X	321437.22	1245043.05	Fuze parts	Non-Ferrous metal, fragment			12/08/2009	X	AIEDA-51
12/06/2009	1043	AIEDA 100%	AIEDA-52			X	321478.64	1245046.83	M-130 series bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-52
12/06/2009	1045	AIEDA 100%	AIEDA-53			X	321490.90	1245066.63	Shaped charge cone	Rusted component			12/08/2009	X	AIEDA-53
12/06/2009	1047	AIEDA 100%	AIEDA-54			X	321490.94	1245078.57	M-100 series bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-54
12/06/2009	1056	AIEDA 100%	AIEDA-55		X		321498.66	1245087.76	M-103 series bomb fuze parts	Pitted, corroded, ferrous and non-			12/08/2009	X	AIEDA-55
12/03/2009	1410	AIEDA T-19	AIEDA-T19-1			X	321671.06	1245438.57	Bomb fuze parts	Rusted, mostly buried			12/08/2009	X	AEIDA T-19-1
12/03/2009	1414	AIEDA T-19	AIEDA-T19-2			X	321628.20	1245451.91	Rocket Motor (empty)	Rusted			12/08/2009	X	AEIDA T-19-2
12/03/2009	1417	AIEDA T-19	AIEDA-T19-3			X	321596.39	1245437.55	Bomb fuze parts	Non-ferrous, pitted, fragmented			12/08/2009	X	AEIDA T-19-3
12/03/2009	1427	AIEDA T-17	AIEDA-T17-4			X	321792.36	1245342.92	Bomb fuze parts	Rusted, parts			12/08/2009	X	AEIDA T-17-4
12/03/2009	1428	AIEDA T-17	AIEDA-T17-5		X		321789.19	1245339.76	Bomblet, BLU-3	Good condition, probably staged,			12/08/2009	X	AEIDA T-17-5
12/03/2009	1429	AIEDA T-17	AIEDA-T17-6			X	321791.31	1245338.60	Bomb fuze parts	Rusted, parts			12/08/2009	X	AEIDA T-17-6
12/03/2009	1432	AIEDA T-17	AIEDA-T17-7			X	321784.90	1245334.30	Bomb fuze parts	Rusted, parts			12/08/2009	X	AEIDA T-17-7
12/03/2009	1433	AIEDA T-17	AIEDA-T17-8			X	321773.95	1245340.66	Bomb fuze parts	Rusted, parts			12/08/2009	X	AEIDA T-17-8
12/03/2009	1437	AIEDA T-17	AIEDA-T17-9			X	321776.01	1245340.56	Firing Device	Rusted, pitted, incomplete			12/08/2009	X	AEIDA T-17-9
12/03/2009	1439	AIEDA T-17	AIEDA-T17-10		X		321772.87	1245332.94	Bomblet, BLU-3	Rusted, fins missing			12/08/2009	X	AEIDA T-17-10
12/03/2009	1450	AIEDA T-17	AIEDA-T17-11			X	321765.69	1245334.04	Bomb fuze parts	Rusted, parts			12/08/2009	X	AEIDA T-17-11

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				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
12/03/2009	1452	AIEDA T-17	AIEDA-T17-12			X	321772.49	1245334.24	Bomb fuze parts	Rusted, parts			12/08/2009	X	AEIDA T-17-12
12/03/2009	1454	AIEDA T-17	AIEDA-T17-13			X	321743.42	1245325.01	Bomb fuze booster cup assembly	Rusted, partially buried			12/08/2009	X	AEIDA T-17-13
12/08/2009	0752	AIEDA T-16	AIEDA-T16-14		X		321439.76	1245274.92	M-100 series bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T16-14
12/08/2009	0800	AIEDA T-16	AIEDA-T16-15			X	321739.15	1245279.01	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T16-15
12/08/2009	0809	AIEDA T-15	AIEDA-T15-16			X	321286.44	1245242.73	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T15-16
12/08/2009	0811	AIEDA T-15	AIEDA-T15-17			X	321299.71	1245236.12	Burster tube	Rusted, parts			12/08/2009	X	AIEDA-T15-17
12/08/2009	0818	AIEDA T-14	AIEDA-T14-18			X	321238.52	1245202.13	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T14-18
12/08/2009	0820	AIEDA T-14	AIEDA-T14-19			X	321235.21	1245189.16	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T14-19
12/08/2009	0822	AIEDA T-14	AIEDA-T14-20			X	321249.28	1245188.23	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T14-20
12/08/2009	0824	AIEDA T-14	AIEDA-T14-21			X	321257.69	1245188.45	Arming stem	Rusted, parts			12/08/2009	X	AIEDA-T14-21
12/08/2009	0827	AIEDA T-14	AIEDA-T14-22		X		321255.82	1245190.73	Fuze	Rusted, parts			12/08/2009	X	AIEDA-T14-22
12/08/2009	0829	AIEDA T-14	AIEDA-T14-23			X	321258.75	1245195.66	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T14-23
12/08/2009	0831	AIEDA T-14	AIEDA-T14-24			X	321282.02	1245185.26	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T14-24
12/08/2009	0833	AIEDA T-14	AIEDA-T14-25		X		321284.55	1245179.17	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T14-25
12/08/2009	0835	AIEDA T-14	AIEDA-T14-26		X		321301.97	1245190.74	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T14-26
12/08/2009	0843	AIEDA T-14	AIEDA-T14-27			X	321642.87	1245214.32	Bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T14-27
12/08/2009	0851	AIEDA T-14	AIEDA-T14-28			X	321797.39	1245202.69	Nose plug/cone	Rusted, parts			12/08/2009	X	AIEDA-T14-28
12/08/2009	0854	AIEDA T-14	AIEDA-T14-29			X	321846.41	1245205.90	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T14-29
12/08/2009	0857	AIEDA T-13	AIEDA-T13-30		X		321826.37	1245139.41	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T13-30
12/08/2009	0900	AIEDA T-13	AIEDA-T13-31		X		321742.10	1245148.68	Submunition, M-38	Good condition			12/08/2009	X	AIEDA-T13-31
12/08/2009	0906	AIEDA T-13	AIEDA-T13-32			X	321307.38	1245150.57	Unknown component	Smashed, possibly by explosives			12/08/2009	X	AIEDA-T13-32
12/08/2009	0907	AIEDA T-13	AIEDA-T13-33		X		321296.21	1245147.08	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T13-33
12/08/2009	0909	AIEDA T-13	AIEDA-T13-34		X		321292.77	1245149.87	M-100 series fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T13-34

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				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
12/08/2009	0911	AIEDA T-13	AIEDA-T13-35			X	321252.95	1245152.57	Cartridge, .50 cal	Fired, empty			12/08/2009	X	AIEDA-T13-35
12/08/2009	0921	AIEDA T-12	AIEDA-T12-36		X		321498.73	1245081.26	M-103 series bomb fuze parts	Rusted, parts			12/08/2009	X	AIEDA-T12-36
12/08/2009	0955	AIEDA T-13	AIEDA-T13-37			X	321731.93	1245091.26	M-100 series arming stem	Rusted, parts			12/08/2009	X	AIEDA-T13-37
12/09/2009	0803	AIEDA T-12	AIEDA-T12-38		X		321830.14	1245092.09	Submunition, BLU-26	Rusted, blue color			12/11/2009	X	AIEDA-T12-38
12/09/2009	0808	AIEDA T-12	AIEDA-T12-39			X	321830.14	1245092.09	Submunition, BLU-26	investigation by Dahlgren EOD this			12/11/2009	X	AIEDA-T12-39
12/09/2009	0813	AIEDA T-12	AIEDA-T12-40		X		321840.10	124509.66	Mk 348 bomb fuze	Rusted, parts			12/11/2009	X	AIEDA-T12-40
12/09/2009	0815	AIEDA T-11	AIEDA-T11-41			X	321607.94	1245059.09	M-100 series fuze parts	Rusted, partially buried			12/11/2009	X	AIEDA-T11-41
12/09/2009	0826	AIEDA T-11	AIEDA-T11-42			X	321452.95	1245032.29	M-904 bomb fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T11-42
12/09/2009	0828	AIEDA T-11	AIEDA-T11-43			X	321359.84	1245039.40	M-100 series fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T11-43
12/09/2009	0829	AIEDA T-11	AIEDA-T11-44			X	321358.62	1245035.49	M-100 series fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T11-44
12/09/2009	0832	AIEDA T-11	AIEDA-T11-45			X	321286.08	1245037.82	M-100 series bomb fuze parts	Rusted, partially buried			12/11/2009	X	AIEDA-T11-45
12/09/2009	0836	AIEDA T-10	AIEDA-T10-46			X	321321.99	1245003.00	M-904 bomb fuze vanes	Rusted, partially buried, damaged			12/11/2009	X	AIEDA-T10-46
12/09/2009	0837	AIEDA T-10	AIEDA-T10-47			X	321337.03	1245000.44	M-905 bomb fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T10-47
12/09/2009	0838	AIEDA T-10	AIEDA-T10-48			X	321333.65	1244992.11	M-904 bomb fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T10-48
12/09/2009	0840	AIEDA T-10	AIEDA-T10-49			X	321388.44	1245002.58	Unknown fuze parts	Rusted, partially buried			12/11/2009	X	AIEDA-T10-49
12/09/2009	0841	AIEDA T-10	AIEDA-T10-50			X	321397.29	1245003.54	Unknown fuze parts	Rusted, partially buried			12/11/2009	X	AIEDA-T10-50
12/09/2009	0842	AIEDA T-10	AIEDA-T10-51			X	321392.89	1244998.30	Unknown fuze parts	Rusted, partially buried			12/11/2009	X	AIEDA-T10-51
12/09/2009	0843	AIEDA T-10	AIEDA-T10-52			X	321394.28	1244980.96	M-100 series bomb fuze parts	Rusted, partially buried			12/11/2009	X	AIEDA-T10-52
12/09/2009	0844	AIEDA T-10	AIEDA-T10-53			X	321388.11	1244985.72	M-904 bomb fuze vanes	Rusted, partially buried			12/11/2009	X	AIEDA-T10-53
12/09/2009	0847	AIEDA T-10	AIEDA-T10-54			X	321594.20	1244982.54	M-103 bomb fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T10-54
12/09/2009	0851	AIEDA T-10	AIEDA-T10-55			X	321615.83	1244992.11	M-48 fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T10-55
12/09/2009	0852	AIEDA T-10	AIEDA-T10-56			X	321615.83	1244992.11	M-48 fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T10-56
12/09/2009	0900	AIEDA T-09	AIEDA-T09-57		X		321408.00	1244942.12	Submunition BLU-7	Aluminum, possible MEC			12/11/2009	X	AIEDA-T09-57

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				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
12/09/2009	0903	AIEDA T-09	AIEDA-T09-58			X	321316.62	1244924.69	Unknown fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T09-58
12/09/2009	0908	AIEDA T-09	AIEDA-T09-59			X	321424.94	1244873.03	M-905 fuze parts	Aluminum, empty partial			12/11/2009	X	AIEDA-T09-59
12/09/2009	1007	AIEDA T-07	AIEDA-T07-60			X	321525.74	1244839.50	M-100 series fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T07-60
12/09/2009	1010	AIEDA T-07	AIEDA-T07-61		X		321461.88	1244841.12	Submunition BLU-7	Aluminum, possible MEC			12/11/2009	X	AIEDA-T07-61
12/09/2009		AIEDA T-07	AIEDA-T07-62				321230.04	1244835.18	M-100 series arming stem	Rusted, parts			12/11/2009	X	AIEDA-T07-62
12/09/2009	1031	AIEDA T-06	AIEDA-T06-63		X		321514.61	1244782.01	M-132 bomb fuze	Rusted, parts			12/11/2009	X	AIEDA-T06-63
12/09/2009	1033	AIEDA T-06	AIEDA-T06-64			X	321556.49	1244793.02	M-100 series fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T06-64
12/09/2009	1037	AIEDA T-06	AIEDA-T06-65			X	321570.60	1244785.14	M-100 series fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T06-65
12/09/2009	1039	AIEDA T-05	AIEDA-T05-66			X	321561.50	1244760.84	M-100 series fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T05-66
12/09/2009	1043	AIEDA T-05	AIEDA-T05-67			X	321350.78	1244740.82	M-100 series fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T05-67
12/09/2009	1045	AIEDA T-05	AIEDA-T05-68			X	321337.41	1244746.46	M-100 series fuze parts	Rusted, parts			12/11/2009	X	AIEDA-T05-68
12/09/2009	1048	AIEDA T-04	AIEDA-T04-69		X		321364.16	1244702.54	Submunition, BLU-7	Aluminum, possible MEC			12/11/2009	X	AIEDA-T04-69
12/09/2009	1049	AIEDA T-04	AIEDA-T04-70		X		321363.43	1244705.64	Submunition, BLU-7	Aluminum, possible MEC			12/11/2009	X	AIEDA-T04-70
12/09/2009	1050	AIEDA T-04	AIEDA-T04-71		X		321375.92	1244696.04	Submunition, BLU-7	Aluminum, possible MEC			12/11/2009	X	AIEDA-T04-71
12/09/2009	1125	AIEDA T-01	AIEDA-T01-72			X	321274.64	1244546.44	Mk 82 bomb casing	Hole in the casing appears to have			12/11/2009	X	AIEDA-T01-72

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MC SAMPLING PROGRAM
ADVANCED IED AREA - UXO 05
NAVAL SUPPORT FACILITY
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Sampling Locations	Justification
X05SB001	MPPEH Location
X05SB002	MPPEH Clusters
X05SB003	MPPEH Location
X05SB004	Check Sampling
X05SB005	MPPEH Location
X05SB006	MPPEH Location
X05SB007	MPPEH Location
X05SB008	Check Sampling
X05SB009	MPPEH Clusters/Geophysical Anomolies
X05SB010	MPPEH Clusters/Geophysical Anomolies
X05SB011	MPPEH Clusters/Geophysical Anomolies
X05SB011	MPPEH Clusters/Geophysical Anomolies
X05SB012	MPPEH Location
X05SB013	MPPEH Clusters
X05SB014	MPPEH Clusters/Geophysical Anomolies
X05SB015	MPPEH Clusters/Geophysical Anomolies
X05SB016	MPPEH Clusters
X05SB017	MPPEH Clusters
X05SB018	MPPEH Clusters/Geophysical Anomolies
X05SB019	MPPEH Clusters/Geophysical Anomolies
X05SB020	MPPEH Clusters
X05SB021	MPPEH Clusters
X05SB022	MPPEH Clusters
X05SB023	Check Sampling
X05SB024	MPPEH Clusters
X05SB025	MPPEH Clusters

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			a01		a02		a04		a07		a13		a15		a17							
				001		002		004		007		013		015		017							
	location			X05SS0010006		X05SS0010006-AVG		X05SS0010006-D		X05SS0010024		X05SS0020006		X05SS0020024		X05SS0030006							
	project_no			X05SB001		X05SB001	X05SB001	X05SB001	X05SB001	X05SB001	X05SB001	X05SB002	X05SB002	X05SB002	X05SB002	X05SB003	X05SB003						
	sample_coc			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042							
	gis_date			X05SS0010006		X05SS0010006-AVG		FD012310-02		X05SS0010024		X05SS0020006		X05SS0020024		X05SS0030006							
	qc_type			20100123		20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123						
	sacode			NM		NM		FD		NM		NM		NM		NM							
	matrix			ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL							
	duplicate			SO		SO		SO		SO		SO		SO		SO							
	top_depth			0		0		X05SS0010006		0		0		0		0							
	bottom_dep			0.5		0.5		0	0.5	0	2	0	0.5	0	2	0	0.5						
	depth_unit			FT		FT		FT		FT		FT		FT		FT							
	submatrix			SS		SS		SS		SS		SS		SS		SS							
cas	x	utl95val	minorpal	c_001		c_002		c_004		c_007		c_013		c_015		c_017							
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U						
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U						
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
2691-41-0	HMX	NA	380	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U						
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U						
121-82-4	RDX	NA	5.5	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
479-45-8	TETRYL	NA	24	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
	Inorganics (mg/kg)																						
7429-90-5	**ALUMINUM**	19700	7700	15300 [PAL] [ORNL] [MDRES] [SSL]		17050 [PAL] [ORNL] [MDRES] [SSL]		18800 [PAL] [ORNL] [MDRES] [SSL]		8500 [PAL] [ORNL] [MDRES] [SSL]		16600 [PAL] [ORNL] [MDRES] [SSL]	J	**32400 [BKG] [PAL] [ORNL] [MDRES] [SSL]**		14800 [PAL] [ORNL] [MDRES] [SSL]							
7440-36-0	ANTIMONY	NA	0.27	0.065	UL	0.065	UL	0.065	UL	0.064	UJ	0.066	UL	0.066	UL	0.066	UL						
7440-38-2	**ARSENIC**	14.9	0.026	4.1 [PAL] [ORNL] [MDRES] [MDSGW]	J	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	9.3 [PAL] [ORNL] [MDRES] [MDSGW]	L						
7440-39-3	BARIUM	80.4	330	53.9	K	59.3	J	64.7	L	73.3	K	74.2	K	77.8	K	92.4 [BKG]	K						
7440-41-7	BERYLLIUM	1.1	16	0.68	J	0.71	L	0.74	L	0.95	J	0.67		0.72	J	0.74	J						
7440-43-9	CADMIUM	2.5	0.36	0.16	U	0.16	UL	0.16	UL	0.16	U	0.49 [PAL] [SSL]		0.21	J	0.55 [PAL] [SSL]							
7440-70-2	CALCIUM	2060	NA	269	K	275.5	J	282	L	269	K	343	K	431	K	840	K						
7440-47-3	**CHROMIUM**	33.4	**26**	20.4	K	22.4	J	24.4	L	26.6 [PAL] [SSL]	K	24.3	K	25	K	18.5	K						
7440-48-4	COBALT	22.3	2.3	20.4 [PAL] [ORNL] [SSL]		20.15 [PAL] [ORNL] [SSL]	L	19.9 [PAL] [ORNL] [SSL]	L	16.1 [PAL] [ORNL] [SSL]		14.4 [PAL] [ORNL] [SSL]		14.6 [PAL] [ORNL] [SSL]		14.5 [PAL] [ORNL] [SSL]							
7440-50-8	**COPPER**	20.3	28	13.3		13.1	L	12.9	L	16.7		9.3		10.7		12.2							
7439-89-6	IRON	38500	5500	22800 [PAL] [ORNL] [MDRES] [SSL]		22850 [PAL] [ORNL] [MDRES] [SSL]		22900 [PAL] [ORNL] [MDRES] [SSL]		29400 [PAL] [ORNL] [MDRES] [SSL]		17400 [PAL] [ORNL] [MDRES] [SSL]		21700 [PAL] [ORNL] [MDRES] [SSL]		20100 [PAL] [ORNL] [MDRES] [SSL]							
7439-92-1	LEAD	62.5	11	23 [PAL] [SSL]		25.15 [PAL] [SSL]	L	27.3 [PAL] [SSL]	L	22.7 [PAL] [SSL]		21.2 [PAL] [SSL]		16.9 [PAL] [SSL]		23.8 [PAL] [SSL]							
7439-93-2	LITHIUM	NA	2	17.4 [PAL] [ORNL] [OPLNT]		19.1 [PAL] [ORNL] [OPLNT]	L	20.8 [PAL] [ORNL] [OPLNT]	L	25.4 [PAL] [ORNL] [OPLNT]		15.8 [PAL] [OPLNT]		20.5 [PAL] [ORNL] [OPLNT]		15.6 [PAL] [OPLNT]							
7439-95-4	MAGNESIUM	1620	4400	1150		1280		1410		1890 [BKG]		1380		1710 [BKG]		1200							
7439-96-5	**MANGANESE**	1390	160	626 [PAL] [ORNL] [MDRES] [SSL]		583.5 [PAL] [ORNL] [MDRES] [SSL]		541 [PAL] [ORNL] [MDRES] [SSL]		445 [PAL] [ORNL] [MDRES] [SSL]		635 [PAL] [ORNL] [MDRES] [SSL]		558 [PAL] [ORNL] [MDRES] [SSL]		1310 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]							
7439-97-6	**MERCURY**	0.16	0.058	0.01	J	0.0295	J	0.049	J	0.019	L	0.065 [PAL] [BTAG]	K	0.064 [PAL] [BTAG]	J	0.084 [PAL] [BTAG]	L						
7440-02-0	**NICKEL**	15.4	38	12.9		14.3	L	15.7 [BKG]	L	18.1 [BKG]		13.4		15.9 [BKG]		16.4 [BKG]							
7440-09-7	POTASSIUM	1470	NA	1170		1525 [BKG]		1880 [BKG]		2110 [BKG]		1470		1850 [BKG]		1360							
7782-49-2	SELENIUM	1.2	0.52	0.22	L	0.118	L	0.032	UL	0.064	UL	0.066	U	0.066	UL	0.22	L						
7440-22-4	SILVER	0.84	4.2	0.16	U	0.16	UL	0.16	UL	0.16	U	0.083	U	0.17	U	4 [BKG]							
7440-23-5	SODIUM	120	NA	29.4	K	38.65	J	47.9	J	59.8	K	41.4	K	46.7	K	66.9	K						
7440-24-6	STRONTIUM	NA	120	5.6	K	6.75	J	7.9	L	8.4	K	8.3	K	9.6	K	11	K						
7440-31-5	TIN	NA	0.89	1.6	U	1.6	U	1.6	U	1.6	U	0.83	U	1.7	U	1.7	U						
7440-62-2	VANADIUM	53.3	7.8	33.7 [PAL] [MDRES] [SSL]	K	35.75 [PAL] [MDRES] [SSL]	J	37.8 [PAL] [MDRES] [SSL]	L	42.4 [PAL] [ORNL] [MDRES] [SSL]	K	40.1 [PAL] [ORNL] [MDRES] [SSL]	K	43.7 [PAL] [ORNL] [MDRES] [SSL]	K	33.9 [PAL] [MDRES] [SSL]	K						
7440-66-6	**ZINC**	37.5	46	44 [BKG]		45.85 [BKG]	L	**47.7 [BKG] [PAL] [SSL]**	L	**51.9 [BKG] [PAL] [SSL]**		44.2 [BKG]		**53.6 [BKG] [PAL] [SSL]**		**73.6 [BKG] [PAL] [SSL]**							
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																						
TTNUS288	PERCENT MOISTURE (%)																						
TTNUS002	PH (S.U.)	**8.8**																					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																					
TTNUS046	TOTAL SOLIDS (%)	**79.2**																					

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
PAGE 2 OF 8

	nsample			a19				a20				a22				a25				a27				a29			
				019				020				022				025				027				029			
	location			X05SB003			X05SB003	X05SS0030024-AVG			X05SB003	X05SS0030024-D			X05SB003	X05SS0040006			X05SB004	X05SS0040024			X05SB004	X05SS0050006			X05SB005
	project_no			00810_2010042				00810_2010042				00810_2010042				00810_2010042				00810_2010042				00810_2010042			
	sample_coc			X05SS0030024				X05SS0030024-AVG				FD012310-01				X05SS0040006				X05SS0040024				X05SS0050006			
	gis_date			20100123			20100123	20100123			20100123	20100123			20100123	20100123			20100123	20100123			20100123	20100123			20100123
	qc_type			NM				NM				FD				NM				NM				NM			
	sacode			ORIG				AVG				DUP				NORMAL				NORMAL				NORMAL			
	matrix			SO				SO				SO				SO				SO				SO			
	duplicate											X05SS0030024															
	top_depth				0				0				0				0				0				0		
	bottom_dep				2				2				2				0.5				2				0.5		
	depth_unit			FT				FT				FT				FT				FT				FT			
	submatrix			SS				SS				SS				SS				SS				SS			
cas	x	utl95val	minorpal	c_019				c_020				c_022				c_025				c_027				c_029			
	Explosives (mg/kg)																										
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.24		U		0.245		U		0.25		U		0.25		U		0.25		U		0.24		U	
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
88-72-2	2-NITROTOLUENE	0.15	2.9	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
618-87-1	3,5-DINITROANILINE	NA	NA	0.24		U		0.245		U		0.25		U		0.25		U		0.25		U		0.24		U	
99-08-1	3-NITROTOLUENE	NA	0.61	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
99-99-0	4-NITROTOLUENE	0.21	30	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
2691-41-0	HMX	NA	380	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
98-95-3	NITROBENZENE	NA	0.023	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
55-63-0	NITROGLYCERIN	NA	0.61	1.1		U		1.15		U		1.2		U		1.2		U		1.2		U		1.2		U	
78-11-5	PETN	NA	NA	1.1		U		1.15		U		1.2		U		1.2		U		1.2		U		1.2		U	
121-82-4	RDX	NA	5.5	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
479-45-8	TETRYL	NA	24	0.19		U		0.195		U		0.2		U		0.2		U		0.2		U		0.19		U	
	Inorganics (mg/kg)																										
7429-90-5	**ALUMINUM**	19700	7700	10900 [PAL] [ORNL] [MDRES] [SSL]		J		14750 [PAL] [ORNL] [MDRES] [SSL]		J		18600 [PAL] [ORNL] [MDRES] [SSL]		J		11800 [PAL] [ORNL] [MDRES] [SSL]				**20300 [BKG] [PAL] [ORNL] [MDRES] [SSL]**		J		11700 [PAL] [ORNL] [MDRES] [SSL]		
7440-36-0	ANTIMONY	NA	0.27	0.065		UL		0.0655		UL		0.066		UL		0.066		UL		0.065		UL		0.065		UL	
7440-38-2	**ARSENIC**	14.9	0.026	4.6 [PAL] [ORNL] [MDRES] [MDSGW]		L		4.5 [PAL] [ORNL] [MDRES] [MDSGW]		L		4.4 [PAL] [ORNL] [MDRES] [MDSGW]		L		2.1 [PAL] [ORNL] [MDRES] [MDSGW]		L		2.6 [PAL] [ORNL] [MDRES] [MDSGW]		L		2.4 [PAL] [ORNL] [MDRES] [MDSGW]		L
7440-39-3	BARIUM	80.4	330	103 [BKG]		K		104 [BKG]		J		105 [BKG]		L		90.8 [BKG]		K		88.4 [BKG]		K		43.1		K	
7440-41-7	BERYLLIUM	1.1	16	0.99				0.995		L		1		L		0.75				0.75				0.42		J	
7440-43-9	CADMIUM	2.5	0.36	0.43 [PAL] [SSL]		J		0.2575		JL		0.17		UL		0.082		U		0.081		U		0.081		U	
7440-70-2	CALCIUM	2060	NA	469		K		440.5		J		412		L		615		K		280		K		203		K	
7440-47-3	**CHROMIUM**	33.4	**26**	21.5		K		22.7		J		23.9		L		17.5		K		17.7		K		13.9		K	
7440-48-4	COBALT	22.3	2.3	21.3 [PAL] [ORNL] [SSL]				21.65 [PAL] [ORNL] [SSL]		L		22 [PAL] [ORNL] [SSL]		L		12.5 [PAL] [ORNL]				12.2 [PAL] [ORNL]				8.3 [PAL] [ORNL]		
7440-50-8	**COPPER**	20.3	28	11				10.35		L		9.7		L		11.2				10.4				8.5			
7439-89-6	IRON	38500	5500	23400 [PAL] [ORNL] [MDRES] [SSL]				23200 [PAL] [ORNL] [MDRES] [SSL]				23000 [PAL] [ORNL] [MDRES] [SSL]				16800 [PAL] [ORNL] [MDRES] [SSL]				16900 [PAL] [ORNL] [MDRES] [SSL]				12000 [PAL] [ORNL] [MDRES] [SSL]		
7439-92-1	LEAD	62.5	11	18.5 [PAL] [SSL]				17.5 [PAL] [SSL]		L		16.5 [PAL] [SSL]		L		29.4 [PAL] [SSL]				12.3 [PAL] [SSL]				19.6 [PAL] [SSL]		
7439-93-2	LITHIUM	NA	2	17.9 [PAL] [ORNL] [OPLNT]				18.2 [PAL] [ORNL] [OPLNT]		L		18.5 [PAL] [ORNL] [OPLNT]		L		16.4 [PAL] [ORNL] [OPLNT]				17.7 [PAL] [ORNL] [OPLNT]				11.2 [PAL] [OPLNT]		
7439-95-4	MAGNESIUM	1620	4400	1320				1380				1440				1360				1390				906			
7439-96-5	**MANGANESE**	1390	160	**1700 [BKG] [PAL] [ORNL] [MDRES] [MDSGW] [SSL]**				**1670 [BKG] [PAL] [ORNL] [MDRES] [MDSGW] [SSL]**				**1640 [BKG] [PAL] [ORNL] [MDRES] [MDSGW] [SSL]**				569 [PAL] [ORNL] [MDRES] [SSL]				464 [PAL] [ORNL] [MDRES] [SSL]				275 [PAL] [ORNL] [MDRES] [SSL]		
7439-97-6	**MERCURY**	0.16	0.058	0.035		L		0.0405		J		0.046		J		0.045		L		0.031		K		0.051		L	
7440-02-0	**NICKEL**	15.4	38	18.5 [BKG]				18.55 [BKG]		L		18.6 [BKG]		L		15.1				15.1				9.7			
7440-09-7	POTASSIUM	1470	NA	1390				1550 [BKG]				1710 [BKG]				1480 [BKG]				1520 [BKG]				1070			
7782-49-2	SELENIUM	1.2	0.52	0.11		L		0.0805		L		0.051		L		0.033		UL		0.065		U		0.032		UL	
7440-22-4	SILVER	0.84	4.2	2 [BKG]				1.7 [BKG]		L		1.4 [BKG]		L		0.082		U		0.081		U		0.081		U	
7440-23-5	SODIUM	120	NA	64.6		K		67.45		J		70.3		L		40.1		K		46.5		K		35.4		K	
7440-24-6	STRONTIUM	NA	120	8.5		K		8.95		J		9.4		L		10.3		K		8.1		K		5.2		K	
7440-31-5	TIN	NA	0.89	1.6		U		1.65		U		1.7		U		0.83		U		0.81		U		0.82		U	
7440-62-2	VANADIUM	53.3	7.8	38.3 [PAL] [MDRES] [SSL]		K		38.7 [PAL] [MDRES] [SSL]		J		39.1 [PAL] [ORNL] [MDRES] [SSL]		L		32.4 [PAL] [MDRES] [SSL]		K		30.9 [PAL] [MDRES] [SSL]		K		22 [PAL] [MDRES] [SSL]		K
7440-66-6	**ZINC**	37.5	46	**61 [BKG] [PAL] [SSL]**				**57.5 [BKG] [PAL] [SSL]**		L		**54 [BKG] [PAL] [SSL]**		L		**46.6 [BKG] [PAL] [SSL]**				41.8 [BKG]				29.4			
	Miscellaneous Parameters																										
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																										
TTNUS288	PERCENT MOISTURE (%)																										
TTNUS002	PH (S.U.)	**8.8**																									
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																									
TTNUS046	TOTAL SOLIDS (%)	**79.2**																									

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			a31		a33		a35		a37		a39		a41		a43							
				031		033		035		037		039		041		043							
				X05SS0050024		X05SS0060006		X05SS0060024		X05SS0070006		X05SS0070024		X05SS0080006		X05SS0080024							
	location			X05SB005	X05SB005	X05SB006	X05SB006	X05SB006	X05SB006	X05SB007	X05SB007	X05SB007	X05SB007	X05SB008	X05SB008	X05SB008	X05SB008						
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042							
	sample_coc			X05SS0050024		X05SS0060006		X05SS0060024		X05SS0070006		X05SS0070024		X05SS0080006		X05SS0080024							
	gis_date			20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123						
	qc_type			NM		NM		NM		NM		NM		NM		NM							
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL							
	matrix			SO		SO		SO		SO		SO		SO		SO							
	duplicate																						
	top_depth			0		0		0		0		0		0		0							
	bottom_dep			2		0.5		2		0.5		2		0.5		2							
	depth_unit			FT		FT		FT		FT		FT		FT		FT							
	submatrix			SS		SS		SS		SS		SS		SS		SS							
cas	x	utl95val	minorpal	c_031		c_033		c_035		c_037		c_039		c_041		c_043							
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U						
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U						
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	0.099	J	1.2	U	1.2	U	1.2	U						
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U						
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U						
	Inorganics (mg/kg)																						
7429-90-5	**ALUMINUM**	19700	7700	12600 [PAL] [ORNL] [MDRES] [SSL]		11900 [PAL] [ORNL] [MDRES] [SSL]		**20600 [BKG] [PAL] [ORNL] [MDRES] [SSL]**		16400 [PAL] [ORNL] [MDRES] [SSL]	J	16100 [PAL] [ORNL] [MDRES] [SSL]	J	10500 [PAL] [ORNL] [MDRES] [SSL]	J	12300 [PAL] [ORNL] [MDRES] [SSL]	J						
7440-36-0	ANTIMONY	NA	0.27	0.064	UL	0.067	J	0.076	J	0.16	B	0.066	UL	0.066	UL	0.064	UL						
7440-38-2	**ARSENIC**	14.9	0.026	2.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	4 [PAL] [ORNL] [MDRES] [MDSGW]		3.2 [PAL] [ORNL] [MDRES] [MDSGW]		2.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.6 [PAL] [ORNL] [MDRES] [MDSGW]							
7440-39-3	BARIUM	80.4	330	59.7	K	52.4	K	54.7	K	54.3	K	70.5	K	45.8	K	55.1	K						
7440-41-7	BERYLLIUM	1.1	16	0.57		0.63	J	0.73	J	0.56		0.69		0.46	J	0.54							
7440-43-9	CADMIUM	2.5	0.36	0.082	U	0.96 [PAL] [SSL]		0.22	J	0.08	U	0.083	U	0.37 [PAL] [SSL]		0.20	J						
7440-70-2	CALCIUM	2060	NA	253	K	212	K	203	K	172	K	188	K	982	K	688	K						
7440-47-3	**CHROMIUM**	33.4	**26**	18	K	20.2	K	22.1	K	19.8	K	20.6	K	25.5	K	21.4	K						
7440-48-4	COBALT	22.3	2.3	10.5 [PAL] [ORNL]		13.7 [PAL] [ORNL] [SSL]		14.6 [PAL] [ORNL] [SSL]		10 [PAL] [ORNL]		11.3 [PAL] [ORNL]		8.2 [PAL] [ORNL]		9.4 [PAL] [ORNL]							
7440-50-8	**COPPER**	20.3	28	12.5		18		16.2		**38.6 [BKG] [PAL] [SSL]**		14.3		11.7		13.6							
7439-89-6	IRON	38500	5500	16600 [PAL] [ORNL] [MDRES] [SSL]		20900 [PAL] [ORNL] [MDRES] [SSL]		25500 [PAL] [ORNL] [MDRES] [SSL]		17300 [PAL] [ORNL] [MDRES] [SSL]		15500 [PAL] [ORNL] [MDRES] [SSL]		13300 [PAL] [ORNL] [MDRES] [SSL]		14100 [PAL] [ORNL] [MDRES] [SSL]							
7439-92-1	LEAD	62.5	11	27.6 [PAL] [SSL]		22.8 [PAL] [SSL]		20.1 [PAL] [SSL]		32 [PAL] [SSL]		21.6 [PAL] [SSL]		30.1 [PAL] [SSL]		17.7 [PAL] [SSL]							
7439-93-2	LITHIUM	NA	2	15 [PAL] [OPLNT]		15.5 [PAL] [OPLNT]		19.4 [PAL] [ORNL] [OPLNT]		15.1 [PAL] [OPLNT]		14.5 [PAL] [OPLNT]		10.9 [PAL] [OPLNT]		12.2 [PAL] [OPLNT]							
7439-95-4	MAGNESIUM	1620	4400	1230		1050		1340		1140		1160		2960 [BKG]		2100 [BKG]							
7439-96-5	**MANGANESE**	1390	160	350 [PAL] [ORNL] [MDRES] [SSL]		401 [PAL] [ORNL] [MDRES] [SSL]		330 [PAL] [ORNL] [MDRES] [SSL]		381 [PAL] [ORNL] [MDRES] [SSL]		587 [PAL] [ORNL] [MDRES] [SSL]		254 [PAL] [ORNL] [MDRES] [SSL]		356 [PAL] [ORNL] [MDRES] [SSL]							
7439-97-6	**MERCURY**	0.16	0.058	0.049	L	0.053	J	0.029	J	**0.18 [BKG] [PAL] [BTAG]**	K	0.046	K	0.049	K	0.032	K						
7440-02-0	**NICKEL**	15.4	38	13.9		14.1		17.5 [BKG]		12.1		12.7		34.1 [BKG]		22.1 [BKG]							
7440-09-7	POTASSIUM	1470	NA	1450		1550 [BKG]		1420		1780 [BKG]		1730 [BKG]		1190		1410							
7782-49-2	SELENIUM	1.2	0.52	0.12	L	0.19	J	0.064	UL	0.14	J	0.066	U	0.066	U	0.064	U						
7440-22-4	SILVER	0.84	4.2	0.082	U	0.16	U	0.16	U	0.08	U	0.083	U	0.081	U	0.081	U						
7440-23-5	SODIUM	120	NA	43.8	K	43.4	J	31.3	J	43.3	K	47.5	K	43.4	K	51.7	K						
7440-24-6	STRONTIUM	NA	120	6.9	K	6.1	K	5.9	K	6.8	K	7.2	K	7.5	K	7.6	K						
7440-31-5	TIN	NA	0.89	0.82	U	1.7	U	1.6	U	0.80	U	0.83	U	0.81	U	0.82	U						
7440-62-2	VANADIUM	53.3	7.8	29.1 [PAL] [MDRES] [SSL]	K	31 [PAL] [MDRES] [SSL]	K	33.1 [PAL] [MDRES] [SSL]	K	33.1 [PAL] [MDRES] [SSL]	K	30.2 [PAL] [MDRES] [SSL]	K	29 [PAL] [MDRES] [SSL]	K	26.9 [PAL] [MDRES] [SSL]	K						
7440-66-6	**ZINC**	37.5	46	39.2 [BKG]		**50 [BKG] [PAL] [SSL]**		46 [BKG]		36.8		36.5		**52.6 [BKG] [PAL] [SSL]**		43.4 [BKG]							
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																						
TTNUS288	PERCENT MOISTURE (%)																						
TTNUS002	PH (S.U.)	**8.8**																					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																					
TTNUS046	TOTAL SOLIDS (%)	**79.2**																					

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				a45		a47		a09		a11		a51		a53		a55	
				045		047		009		011		051		053		055	
	nsample			X05SS0090006		X05SS0090024		X05SS0100006		X05SS0100024		X05SS0110024		X05SS0120006		X05SS0120024	
	location			X05SB009	X05SB009	X05SB009	X05SB009	X05SB010	X05SB001	X05SB010	X05SB001	X05SB011	X05SB011	X05SB012	X05SB012	X05SB012	X05SB012
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X05SS0090006		X05SS0090024		X05SS0100006		X05SS0100024		X05SS0110024		X05SS0120006		X05SS0120024	
	gis_date			20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100123	20100123	20100123	20100123
	qc_type			NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate																
	top_depth			0		0		0		0		0		0		0	
	bottom_dep			0.5	2		2		0.5		2		2		0.5		2
	depth_unit			FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS	
cas	x	utl95val	minorpal	c_045		c_047		c_009		c_011		c_051		c_053		c_055	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
618-87-1	3,5-DINITROANILILNE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
	Inorganics (mg/kg)																
7429-90-5	**ALUMINUM**	19700	7700	5950 [SSL]		9410 [PAL] [ORNL] [MDRES] [SSL]		12400 [PAL] [ORNL] [MDRES] [SSL]		9410 [PAL] [ORNL] [MDRES] [SSL]		14600 [PAL] [ORNL] [MDRES] [SSL]		11800 [PAL] [ORNL] [MDRES] [SSL]		5680 [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.033	UL	0.12	J	0.033	UL	0.033	UL	0.037	J	0.065	UL	0.033	UL
7440-38-2	**ARSENIC**	14.9	0.026	4.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	**15.7 [BKG] [PAL] [ORNL] [MDRES] [MDSGW]**	L	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	0.82 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	80.4	330	31.9	L	104 [BKG]	L	38.1	L	49.7	L	44.3	L	80.1	K	86.5 [BKG]	K
7440-41-7	BERYLLIUM	1.1	16	0.32	J	0.50	K	0.73	K	0.47	J	0.51	L	0.82		0.89	
7440-43-9	CADMIUM	2.5	0.36	0.21	J	0.083	UL	0.78 [PAL] [SSL]	L	0.27	L	0.55 [PAL] [SSL]	L	0.083	U	0.083	U
7440-70-2	CALCIUM	2060	NA	626	L	387	L	1970	L	897	L	809	L	290	K	237	K
7440-47-3	**CHROMIUM**	33.4	**26**	12.4	L	15.3	L	15.8	L	12.9	L	17.8	L	18.1	K	20.4	K
7440-48-4	COBALT	22.3	2.3	3.2 [PAL] [ORNL]	L	4.5 [PAL] [ORNL]	L	7.6 [PAL] [ORNL]	L	4.5 [PAL] [ORNL]	L	4.6 [PAL] [ORNL]	L	16.5 [PAL] [ORNL] [SSL]		15.8 [PAL] [ORNL] [SSL]	
7440-50-8	**COPPER**	20.3	28	12.1	L	22.8 [BKG]	L	13.4	L	13.1	L	**35.7 [BKG] [PAL] [SSL]**	L	9.5		9.1	
7439-89-6	IRON	38500	5500	8090 [PAL] [ORNL] [MDRES] [SSL]		14900 [PAL] [ORNL] [MDRES] [SSL]		11900 [PAL] [ORNL] [MDRES] [SSL]		12400 [PAL] [ORNL] [MDRES] [SSL]		14800 [PAL] [ORNL] [MDRES] [SSL]		16100 [PAL] [ORNL] [MDRES] [SSL]		17400 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	11	10.1	L	8.9	L	11.1 [PAL] [SSL]	L	7.4	L	11.4 [PAL] [SSL]	L	19.5 [PAL] [SSL]		14.4 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	2	4.4 [PAL] [OPLNT]	L	6.1 [PAL] [OPLNT]	L	7.3 [PAL] [OPLNT]	L	8.4 [PAL] [OPLNT]	L	13.9 [PAL] [OPLNT]	L	14.8 [PAL] [OPLNT]		15.7 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620	4400	508		433		1130		754		1260		1180		1420	
7439-95-5	**MANGANESE**	1390	160	365 [PAL] [ORNL] [MDRES] [SSL]		170 [PAL] [MDRES]		99.9		68.9		68.4		1250 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]		975 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]	
7439-97-6	**MERCURY**	0.16	0.058	**0.93 [BKG] [PAL] [BTAG]**	J	**0.48 [BKG] [PAL] [BTAG]**	J	**1.2 [BKG] [PAL] [BTAG]**		**0.38 [BKG] [PAL] [BTAG]**		0.025	J	0.056	L	0.012	L
7440-02-0	**NICKEL**	15.4	38	7.9	L	14.6	L	18.6 [BKG]	L	14.2	L	11.3	L	15.8 [BKG]		17.7 [BKG]	
7440-09-7	POTASSIUM	1470	NA	772		697		958		881		1520 [BKG]		1300		1240	
7782-49-2	SELENIUM	1.2	0.52	0.18	L	0.42	L	0.045	L	0.10	L	0.032	UL	0.058	L	0.033	UL
7440-22-4	SILVER	0.84	4.2	0.08	UL	0.083	UL	0.082	UL	0.083	UL	0.083	UL	0.37		0.14	J
7440-23-5	SODIUM	120	NA	12.6	J	21	J	20.9	J	20.3	J	44	L	44.3	K	46.4	K
7440-24-6	STRONTIUM	NA	120	7	L	13.6	L	10.7	L	8	L	7.5	L	7.3	K	6.9	K
7440-31-5	TIN	NA	0.89	0.80	U	0.83	U	0.83	U	1.1 [PAL] [BTAG]	K	0.83	U	0.83	U	0.83	U
7440-62-2	VANADIUM	53.3	7.8	22.4 [PAL] [MDRES] [SSL]	L	21.5 [PAL] [MDRES] [SSL]	L	24.8 [PAL] [MDRES] [SSL]	L	18.8 [PAL] [MDRES] [SSL]	L	23.9 [PAL] [MDRES] [SSL]	L	33.2 [PAL] [MDRES] [SSL]	K	32.6 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	18.7	L	16.1	L	38.7 [BKG]	L	25.5	L	33.3	L	**46.8 [BKG] [PAL] [SSL]**		**51.1 [BKG] [PAL] [SSL]**	
	Miscellaneous Parameters																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)											89					
TTNUS288	PERCENT MOISTURE (%)											1.8					
TTNUS002	PH (S.U.)	**8.8**										5.42					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200										4770					
TTNUS046	TOTAL SOLIDS (%)	**79.2**										98.2					

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			a57		a59		a61		a63		a65		a67		a69							
				057		059		061		063		065		067		069							
	location			X05SS0130006		X05SS0130024		X05SS0140006		X05SS0140024		X05SS0150006		X05SS0150024		X05SS0160006							
	project_no			X05SB013	X05SB013	X05SB013	X05SB013	X05SB014	X05SB014	X05SB014	X05SB014	X05SB015	X05SB015	X05SB015	X05SB015	X05SB016	X05SB016						
	sample_coc			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042							
	gis_date			X05SS0130006		X05SS0130024		X05SS0140006		X05SS0140024		X05SS0150006		X05SS0150024		X05SS0160006							
	qc_type			20100123	20100123	20100123	20100123	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100123	20100123						
	sacode			NM		NM		NM		NM		NM		NM		NM							
	matrix			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL							
	duplicate			SO		SO		SO		SO		SO		SO		SO							
	top_depth				0		0		0		0		0		0		0						
	bottom_dep				0.5		2		0.5		2		0.5		2		0.5						
	depth_unit			FT		FT		FT		FT		FT		FT		FT							
	submatrix			SS		SS		SS		SS		SS		SS		SS							
cas	x	utl95val	minorpal	c_057		c_059		c_061		c_063		c_065		c_067		c_069							
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.25	U	0.25	U	2.5	U	0.25	U	0.25	U						
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2		2	U	0.062	J	0.2	U						
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	2.5	U	0.25	U	0.25	U						
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	18.3	K	5.2	K	0.2	U						
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	0.94 [PAL] [ORNL]	J	0.22	J	1.2	U						
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	12	U	1.2	U	1.2	U						
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U	0.2	U						
	Inorganics (mg/kg)																						
7429-90-5	**ALUMINUM**	19700	7700	18900 [PAL] [ORNL] [MDRES] [SSL]	J	12000 [PAL] [ORNL] [MDRES] [SSL]	J	15800 [PAL] [ORNL] [MDRES] [SSL]		14100 [PAL] [ORNL] [MDRES] [SSL]		8170 [PAL] [ORNL] [MDRES] [SSL]		12600 [PAL] [ORNL] [MDRES] [SSL]		12600 [PAL] [ORNL] [MDRES] [SSL]							
7440-36-0	ANTIMONY	NA	0.27	0.065	UL	0.064	UL	0.033	UL	0.065	UL	0.044	J	0.032	UL	0.066	UL						
7440-38-2	**ARSENIC**	14.9	0.026	2.1 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.2 [PAL] [ORNL] [MDRES] [MDSGW]	L						
7440-39-3	BARIUM	80.4	330	35.6	K	56.1	K	42.6	L	41.6	L	27.5	L	30.7	L	57.5	K						
7440-41-7	BERYLLIUM	1.1	16	0.39	J	0.55		0.53	L	0.51	L	0.30	J	0.35	J	0.65	J						
7440-43-9	CADMIUM	2.5	0.36	0.14	J	0.18	J	0.31	L	0.15	J	0.30	L	0.081	UL	0.16	U						
7440-70-2	CALCIUM	2060	NA	191	K	174	K	857	L	751	L	1830	L	713	L	207	K						
7440-47-3	CHROMIUM	33.4	26	11.6	K	14.5	K	16.6	L	17.3	L	12.5	L	14.4	L	19.7	K						
7440-48-4	COBALT	22.3	2.3	8.2 [PAL] [ORNL]		10.4 [PAL] [ORNL]		4.9 [PAL] [ORNL]	L	4 [PAL] [ORNL]	L	2.4 [PAL] [ORNL]	L	4 [PAL] [ORNL]	L	7.7 [PAL] [ORNL]							
7440-50-8	**COPPER**	20.3	28	6.2		6.1		15.6	L	18.9	L	17.8	L	20.5 [BKG]	L	15.8							
7439-89-6	IRON	38500	5500	9060 [PAL] [ORNL] [MDRES] [SSL]		11200 [PAL] [ORNL] [MDRES] [SSL]		16400 [PAL] [ORNL] [MDRES] [SSL]		15800 [PAL] [ORNL] [MDRES] [SSL]		8860 [PAL] [ORNL] [MDRES] [SSL]		11300 [PAL] [ORNL] [MDRES] [SSL]		24600 [PAL] [ORNL] [MDRES] [SSL]							
7439-92-1	LEAD	62.5	11	15.8 [PAL] [SSL]		11.3 [PAL] [SSL]		9.3	L	9.6	L	15.1 [PAL] [SSL]	L	19 [PAL] [SSL]	L	25.9 [PAL] [SSL]							
7439-93-2	LITHIUM	NA	2	9.6 [PAL] [OPLNT]		12.7 [PAL] [OPLNT]		13.3 [PAL] [OPLNT]	L	14.2 [PAL] [OPLNT]	L	6.9 [PAL] [OPLNT]	L	10.1 [PAL] [OPLNT]	L	21.5 [PAL] [ORNL] [OPLNT]							
7439-95-4	MAGNESIUM	1620	4400	680		891		1060		1100		725		737		1410							
7439-96-5	**MANGANESE**	1390	160	235 [PAL] [ORNL] [MDRES] [SSL]		253 [PAL] [ORNL] [MDRES] [SSL]		87.6		82.5		68.5		58.7		465 [PAL] [ORNL] [MDRES] [SSL]							
7439-97-6	**MERCURY**	0.16	0.058	0.043	K	0.026	K	0.033	J	0.035	J	0.044		0.018	J	0.054	L						
7440-02-0	**NICKEL**	15.4	38	8.3		10.5		**230 [BKG] [PAL] [ORNL] [MDRES] [SSL]**	L	**73 [BKG] [PAL] [SSL]**	L	7.1	L	7.5	L	15.6 [BKG]							
7440-09-7	POTASSIUM	1470	NA	958		1040		1580 [BKG]		1550 [BKG]		844		1160		1720 [BKG]							
7782-49-2	SELENIUM	1.2	0.52	0.13	J	0.064	U	0.033	UL	0.033	UL	0.044	L	0.032	UL	0.30	L						
7440-22-4	SILVER	0.84	4.2	0.083	U	0.082	U	0.083	UL	0.083	UL	0.083	UL	0.081	UL	0.16	U						
7440-23-5	SODIUM	120	NA	25.2	K	27.4	K	48.7	L	56.9	L	18.2	J	27.4	L	51.1	K						
7440-24-6	STRONTIUM	NA	120	5.1	K	5.6	K	7.1	L	7.1	L	6.7	L	5.4	L	7	K						
7440-31-5	TIN	NA	0.89	0.83	U	0.82	U	0.83	U	0.83	U	0.83	U	0.81	U	1.7	U						
7440-62-2	VANADIUM	53.3	7.8	21.9 [PAL] [MDRES] [SSL]	K	23.2 [PAL] [MDRES] [SSL]	K	25.9 [PAL] [MDRES] [SSL]	L	26.4 [PAL] [MDRES] [SSL]	L	20.1 [PAL] [MDRES] [SSL]	L	20.8 [PAL] [MDRES] [SSL]	L	33.7 [PAL] [MDRES] [SSL]	K						
7440-66-6	**ZINC**	37.5	46	26.3		33.5		33.1	L	33.6	L	29.9	L	24	L	45.4 [BKG]							
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																						
TTNUS288	PERCENT MOISTURE (%)																						
TTNUS002	PH (S.U.)	8.8						5.61		5.28 [		6.79		6.32									
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																					
TTNUS046	TOTAL SOLIDS (%)	79.2																					

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
PAGE 6 OF 8

	nsample			a71		a73		a75		a77		a79		a81		a83		a85					
				071		073		075		077		079		081		083		085					
				X05SS0160024		X05SS0170006		X05SS0170024		X05SS0180006		X05SS0180024		X05SS0190006		X05SS0190024		X05SS0200006					
	location			X05SB016	X05SB016	X05SB017	X05SB017	X05SB017	X05SB017	X05SB018	X05SB018	X05SB018	X05SB018	X05SB019	X05SB019	X05SB019	X05SB019	X05SB020	X05SB020				
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042					
	sample_coc			X05SS0160024		X05SS0170006		X05SS0170024		X05SS0180006		X05SS0180024		X05SS0190006		X05SS0190024		X05SS0200006					
	gis_date			20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123				
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM					
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL					
	matrix			SO		SO		SO		SO		SO		SO		SO		SO					
	duplicate																						
	top_depth			0		0		0		0		0		0		0		0					
	bottom_dep			2		0.5		2		0.5		2		0.5		2		0.5					
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT					
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS					
cas	x	utl95val	minorpal	c_071		c_073		c_075		c_077		c_079		c_081		c_083		c_085					
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U				
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.25		0.13	J	0.2	U				
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U				
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.94	K	4	K	0.2	U				
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	0.22	J	0.087	J	1.2	U				
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U				
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U				
	Inorganics (mg/kg)																						
7429-90-5	**ALUMINUM**	19700	7700	8090 [PAL] [ORNL] [MDRES] [SSL]		18100 [PAL] [ORNL] [MDRES] [SSL]	J	14100 [PAL] [ORNL] [MDRES] [SSL]	J	6970 [SSL]	J	7070 [SSL]	J	10300 [PAL] [ORNL] [MDRES] [SSL]	J	9090 [PAL] [ORNL] [MDRES] [SSL]	J	11000 [PAL] [ORNL] [MDRES] [SSL]	J				
7440-36-0	ANTIMONY	NA	0.27	0.033	UL	0.064	UL	0.066	UL	0.071	B	0.065	UJ	0.078	B	0.066	UL	0.063	UJ				
7440-38-2	**ARSENIC**	14.9	0.026	2 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.7 [PAL] [ORNL] [MDRES] [MDSGW]		3 [PAL] [ORNL] [MDRES] [MDSGW]		2.2 [PAL] [ORNL] [MDRES] [MDSGW]		3.2 [PAL] [ORNL] [MDRES] [MDSGW]		3 [PAL] [ORNL] [MDRES] [MDSGW]		2.6 [PAL] [ORNL] [MDRES] [MDSGW]		2.3 [PAL] [ORNL] [MDRES] [MDSGW]					
7440-39-3	BARIUM	80.4	330	55.9	K	28.1	K	42	K	25.9	K	35.7	K	37.4	K	34.6	K	36.5	K				
7440-41-7	BERYLLIUM	1.1	16	0.64	J	0.33	J	0.51		0.29	J	0.47	J	0.46	J	0.43	J	0.61					
7440-43-9	CADMIUM	2.5	0.36	0.16	U	0.08	U	0.082	U	0.11	J	0.082	U	0.74 [PAL] [SSL]		0.49 [PAL] [SSL]		1.2 [PAL] [SSL]					
7440-70-2	CALCIUM	2060	NA	125	K	168	K	164	K	634	K	594	K	3230 [BKG]	K	2140 [BKG]	K	2830 [BKG]	K				
7440-47-3	**CHROMIUM**	33.4	**26**	17	K	13.2	K	18.1	K	10.8	K	15.1	K	16	K	15.5	K	14.4	K				
7440-48-4	COBALT	22.3	2.3	8.3 [PAL] [ORNL]		7.3 [PAL] [ORNL]		8.1 [PAL] [ORNL]		2.8 [PAL] [ORNL]		3.3 [PAL] [ORNL]		4.4 [PAL] [ORNL]		3.8 [PAL] [ORNL]		5.7 [PAL] [ORNL]					
7440-50-8	**COPPER**	20.3	28	12.6		11.1		10.2		26.4 [BKG]		19.2		**60.1 [BKG] [PAL] [SSL]**		**53.8 [BKG] [PAL] [SSL]**		23 [BKG]					
7439-89-6	IRON	38500	5500	21000 [PAL] [ORNL] [MDRES] [SSL]		11400 [PAL] [ORNL] [MDRES] [SSL]		15200 [PAL] [ORNL] [MDRES] [SSL]		9450 [PAL] [ORNL] [MDRES] [SSL]		13600 [PAL] [ORNL] [MDRES] [SSL]		12700 [PAL] [ORNL] [MDRES] [SSL]		11400 [PAL] [ORNL] [MDRES] [SSL]		12000 [PAL] [ORNL] [MDRES] [SSL]					
7439-92-1	LEAD	62.5	11	16.1 [PAL] [SSL]		18.2 [PAL] [SSL]		12.9 [PAL] [SSL]		16.6 [PAL] [SSL]		9.8		23.6 [PAL] [SSL]		20 [PAL] [SSL]		16.6 [PAL] [SSL]					
7439-93-2	LITHIUM	NA	2	17.8 [PAL] [ORNL] [OPLNT]		9.5 [PAL] [OPLNT]		12.9 [PAL] [OPLNT]		6.8 [PAL] [OPLNT]		11.2 [PAL] [OPLNT]		9.9 [PAL] [OPLNT]		10 [PAL] [OPLNT]		7.7 [PAL] [OPLNT]					
7439-95-4	MAGNESIUM	1620	4400	1210		723		1090		574		872		1090		953		965					
7439-96-5	**MANGANESE**	1390	160	262 [PAL] [ORNL] [MDRES] [SSL]		223 [PAL] [ORNL] [MDRES] [SSL]		182 [PAL] [ORNL] [MDRES]		103		87		166 [PAL] [MDRES]		109		166 [PAL] [MDRES]					
7439-97-6	**MERCURY**	0.16	0.058	0.022	L	0.051	K	0.042	K	0.075 [PAL] [BTAG]	K	0.066 [PAL] [BTAG]	K	0.16 [PAL] [BTAG]	K	0.089 [PAL] [BTAG]	K	**0.21 [BKG] [PAL] [BTAG]**	K				
7440-02-0	**NICKEL**	15.4	38	12.9		8		11.3		11.7		14.3		15.9 [BKG]		10.1		10.7					
7440-09-7	POTASSIUM	1470	NA	1480 [BKG]		977		1390		939		1520 [BKG]		1270		1340		995					
7782-49-2	SELENIUM	1.2	0.52	0.033	UL	0.075	J	0.066	U	0.065	U	0.065	U	0.065	U	0.066	U	0.088	J				
7440-22-4	SILVER	0.84	4.2	0.16	U	0.08	U	0.082	U	0.083	U	0.082	U	0.082	U	0.083	U	0.083	U				
7440-23-5	SODIUM	120	NA	37	K	22.2	K	31	K	27.6	K	49.1	K	42.8	K	35.1	K	28.2	K				
7440-24-6	STRONTIUM	NA	120	5.8	K	4.7	K	5.7	K	5.2	K	6.7	K	11	K	8.6	K	11	K				
7440-31-5	TIN	NA	0.89	1.6	U	0.81	U	0.83	U	0.83	U	0.83	U	0.82	U	0.83	U	0.83	U				
7440-62-2	VANADIUM	53.3	7.8	27.3 [PAL] [MDRES] [SSL]	K	24 [PAL] [MDRES] [SSL]	K	29.7 [PAL] [MDRES] [SSL]	K	16.8 [PAL] [MDRES] [SSL]	K	22.5 [PAL] [MDRES] [SSL]	K	27.3 [PAL] [MDRES] [SSL]	K	24.5 [PAL] [MDRES] [SSL]	K	26.6 [PAL] [MDRES] [SSL]	K				
7440-66-6	**ZINC**	37.5	46	37.8 [BKG]		24.3		31.7		30.2		29.5		45.9 [BKG]		33.6		39.7 [BKG]					
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																						
TTNUS288	PERCENT MOISTURE (%)																						
TTNUS002	PH (S.U.)	**8.8**																					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																					
TTNUS046	TOTAL SOLIDS (%)	**79.2**																					

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			a87		a89		a90		a92		a95		a97		a99					
				087		089		090		092		095		097		099					
				X05SS0200024		X05SS0210006		X05SS0210006-AVG		X05SS0210006-D		X05SS0210024		X05SS0220006		X05SS0220024					
	location			X05SB020	X05SB020	X05SB021	X05SB021	X05SB021	X05SB021	X05SB021	X05SB021	X05SB021	X05SB021	X05SB022	X05SB022	X05SB022	X05SB022				
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042					
	sample_coc			X05SS0200024		X05SS0210006		X05SS0210006-AVG		FD012410-01		X05SS0210024		X05SS0220006		X05SS0220024					
	gis_date			20100123	20100123	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100123	20100123	20100123	20100123				
	qc_type			NM		NM		NM		FD		NM		NM		NM					
	sacode			NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL					
	matrix			SO		SO		SO		SO		SO		SO		SO					
	duplicate									X05SS0210006											
	top_depth			0		0		0		0		0		0		0					
	bottom_dep			2		0.5		0.5		0.5		2		0.5		2					
	depth_unit			FT		FT		FT		FT		FT		FT		FT					
	submatrix			SS		SS		SS		SS		SS		SS		SS					
cas	x	utl95val	minorpal	c_087		c_089		c_090		c_092		c_095		c_097		c_099					
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U				
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U				
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U				
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U				
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U				
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	19700	7700	11200 [PAL] [ORNL] [MDRES] [SSL]		10300 [PAL] [ORNL] [MDRES] [SSL]		9890 [PAL] [ORNL] [MDRES] [SSL]		9480 [PAL] [ORNL] [MDRES] [SSL]		11000 [PAL] [ORNL] [MDRES] [SSL]		7590 [SSL]		11300 [PAL] [ORNL] [MDRES] [SSL]		J			
7440-36-0	ANTIMONY	NA	0.27	0.033	UL	0.033	UL	0.0495	UL	0.066	UL	0.033	UL	0.12	L	0.033	UL				
7440-38-2	**ARSENIC**	14.9	0.026	1.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.9 [PAL] [ORNL] [MDRES] [MDSGW]	L				
7440-39-3	BARIUM	80.4	330	39.1	L	33.8	L	34.3	L	34.8	L	35.9	L	76.2	K	113 [BKG]	K				
7440-41-7	BERYLLIUM	1.1	16	0.69	L	0.42	L	0.41	L	0.40	L	0.41	L	0.74	J	0.95	J				
7440-43-9	CADMIUM	2.5	0.36	0.66 [PAL] [SSL]	L	0.14	J	0.245	K	0.35	K	0.31	L	0.17	U	0.16	U				
7440-70-2	CALCIUM	2060	NA	2130 [BKG]	K	1490	J	1995	J	2500 [BKG]	J	2210 [BKG]	L	488	K	338	K				
7440-47-3	**CHROMIUM**	33.4	**26**	15.2	L	14.4	L	13.85	L	13.3	L	14.1	L	21.3	K	22.3	K				
7440-48-4	COBALT	22.3	2.3	6.6 [PAL] [ORNL]	L	4.8 [PAL] [ORNL]	L	4.8 [PAL] [ORNL]	L	4.8 [PAL] [ORNL]	L	5.1 [PAL] [ORNL]	L	15.3 [PAL] [ORNL] [SSL]		19.8 [PAL] [ORNL] [SSL]					
7440-50-8	**COPPER**	20.3	28	22.5 [BKG]	L	10	L	10.55	L	11.1	L	12.4	L	17.3		11.8					
7439-89-6	IRON	38500	5500	13400 [PAL] [ORNL] [MDRES] [SSL]		13100 [PAL] [ORNL] [MDRES] [SSL]		12650 [PAL] [ORNL] [MDRES] [SSL]		12200 [PAL] [ORNL] [MDRES] [SSL]		12800 [PAL] [ORNL] [MDRES] [SSL]		18200 [PAL] [ORNL] [MDRES] [SSL]		18800 [PAL] [ORNL] [MDRES] [SSL]					
7439-92-1	LEAD	62.5	11	12.8 [PAL] [SSL]	L	8.1	L	8.95	L	9.8	L	10.8	L	40.3 [PAL] [SSL]		23.3 [PAL] [SSL]					
7439-93-2	LITHIUM	NA	2	7.8 [PAL] [OPLNT]	L	11.5 [PAL] [OPLNT]	L	11.15 [PAL] [OPLNT]	L	10.8 [PAL] [OPLNT]	L	11.1 [PAL] [OPLNT]	L	14 [PAL] [OPLNT]		16.5 [PAL] [ORNL] [OPLNT]					
7439-95-4	MAGNESIUM	1620	4400	872		821		843		865		876		1000		1130					
7439-96-5	**MANGANESE**	1390	160	95.2		90.9		101.45		112		115		1270 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]		1170 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]					
7439-97-6	**MERCURY**	0.16	0.058	**0.39 [BKG] [PAL] [BTAG]**		0.018	J	0.02	J	0.022	J	0.03	J	0.099 [PAL] [BTAG]	L	0.037	L				
7440-02-0	**NICKEL**	15.4	38	14.4	L	10.6	L	10.2	L	9.8	L	9.8	L	13.7		16.8 [BKG]					
7440-09-7	POTASSIUM	1470	NA	947		1200		1220		1240		1280		1110		1440					
7782-49-2	SELENIUM	1.2	0.52	0.07	J	0.033	UL	0.033	UL	0.033	UL	0.033	UL	0.072	L	0.24	L				
7440-22-4	SILVER	0.84	4.2	0.082	UL	0.082	UL	0.0825	UL	0.083	UL	0.083	UL	0.53		0.19	J				
7440-23-5	SODIUM	120	NA	32.2	L	26.8	L	27.95	L	29.1	L	28.5	L	37.3	J	48.7	K				
7440-24-6	STRONTIUM	NA	120	10.6	L	7	L	7.85	L	8.7	L	8.8	L	8.5	K	8.4	K				
7440-31-5	TIN	NA	0.89	0.82	U	0.82	U	0.825	U	0.83	U	0.83	U	1.7	U	1.6	U				
7440-62-2	VANADIUM	53.3	7.8	24.6 [PAL] [MDRES] [SSL]	L	21.4 [PAL] [MDRES] [SSL]	L	21.6 [PAL] [MDRES] [SSL]	L	21.8 [PAL] [MDRES] [SSL]	L	23 [PAL] [MDRES] [SSL]	L	34.6 [PAL] [MDRES] [SSL]	K	33.5 [PAL] [MDRES] [SSL]	K				
7440-66-6	**ZINC**	37.5	46	36.8	L	27.5	L	28.8	L	30.1	L	30.6	L	**55.9 [BKG] [PAL] [SSL]**		**51.4 [BKG] [PAL] [SSL]**					
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																				
TTNUS288	PERCENT MOISTURE (%)																				
TTNUS002	PH (S.U.)	**8.8**				6.96		6.96				7.38									
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																			
TTNUS046	TOTAL SOLIDS (%)	**79.2**																			

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			a011		a031		a051		a071		a091		a111					
				101		103		105		107		109		111					
	location			X05SS0230006		X05SS0230024		X05SS0240006		X05SS0240024		X05SS0250006		X05SS0250024					
	project_no			X05SB023	X05SB023	X05SB023	X05SB023	X05SB024	X05SB024	X05SB024	X05SB024	X05SB025	X05SB025	X05SB025	X05SB025				
	sample_coc			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042					
	gis_date			X05SS0230006		X05SS0230024		X05SS0240006		X05SS0240024		X05SS0250006		X05SS0250024					
	qc_type			20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123				
	sacode			NM		NM		NM		NM		NM		NM					
	matrix			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL					
	duplicate			SO		SO		SO		SO		SO		SO					
	top_depth			0		0		0		0		0		0					
	bottom_dep			0.5		2		0.5		2		0.5		2					
	depth_unit			FT		FT		FT		FT		FT		FT					
	submatrix			SS		SS		SS		SS		SS		SS					
cas	x	utl95val	minorpal	c_101		c_103		c_105		c_107		c_109		c_111					
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.24	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U				
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
88-72-2	2-NITROTOLUENE	0.15	2.9	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U				
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
99-99-0	4-NITROTOLUENE	0.21	30	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
2691-41-0	HMX	NA	380	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U				
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U				
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U				
	Inorganics (mg/kg)																		
7429-90-5	**ALUMINUM**	19700	7700	3610 [SSL]		11600 [PAL] [ORNL] [MDRES] [SSL]		13700 [PAL] [ORNL] [MDRES] [SSL]	J	14900 [PAL] [ORNL] [MDRES] [SSL]	J	7570 [SSL]	J	9410 [PAL] [ORNL] [MDRES] [SSL]	J				
7440-36-0	ANTIMONY	NA	0.27	0.033	UL	0.064	UL	0.065	UL	0.065	UL	0.065	UL	0.066	UL				
7440-38-2	**ARSENIC**	14.9	0.026	0.88 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.6 [PAL] [ORNL] [MDRES] [MDSGW]		3.8 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.2 [PAL] [ORNL] [MDRES] [MDSGW]					
7440-39-3	BARIUM	80.4	330	37.4	K	48.5	K	48.8	K	49.6	K	32	K	46.1	K				
7440-41-7	BERYLLIUM	1.1	16	0.37	J	0.48	J	0.49		0.58		0.33	J	0.44	J				
7440-43-9	CADMIUM	2.5	0.36	0.081	U	0.081	U	0.098	J	0.083	U	0.081	U	0.083	U				
7440-70-2	CALCIUM	2060	NA	156	K	121	K	247	K	183	L	192	K	168	K				
7440-47-3	**CHROMIUM**	33.4	**26**	13.8	K	14.9	K	18	K	21.8	K	10.9	K	10.6	K				
7440-48-4	COBALT	22.3	2.3	6.6 [PAL] [ORNL]		8.5 [PAL] [ORNL]		5.9 [PAL] [ORNL]		5.8 [PAL] [ORNL]		6.2 [PAL] [ORNL]		9.9 [PAL] [ORNL]					
7440-50-8	**COPPER**	20.3	28	9.4		9.1		10.4		11.4		11.8		6.6					
7439-89-6	IRON	38500	5500	11700 [PAL] [ORNL] [MDRES] [SSL]		11800 [PAL] [ORNL] [MDRES] [SSL]		12300 [PAL] [ORNL] [MDRES] [SSL]		13600 [PAL] [ORNL] [MDRES] [SSL]		8380 [PAL] [ORNL] [MDRES] [SSL]		7470 [PAL] [ORNL] [MDRES] [SSL]					
7439-92-1	LEAD	62.5	11	19.6 [PAL] [SSL]		12.6 [PAL] [SSL]		20.4 [PAL] [SSL]		14.7 [PAL] [SSL]		17 [PAL] [SSL]		9.7					
7439-93-2	LITHIUM	NA	2	11.6 [PAL] [OPLNT]		13.9 [PAL] [OPLNT]		14.6 [PAL] [OPLNT]		19.2 [PAL] [ORNL] [OPLNT]		8.9 [PAL] [OPLNT]		8.6 [PAL] [OPLNT]					
7439-95-4	MAGNESIUM	1620	4400	778		910		1140		1510		715		699					
7439-96-5	**MANGANESE**	1390	160	306 [PAL] [ORNL] [MDRES] [SSL]		294 [PAL] [ORNL] [MDRES] [SSL]		117		73.8		200 [PAL] [ORNL] [MDRES]		335 [PAL] [ORNL] [MDRES] [SSL]					
7439-97-6	**MERCURY**	0.16	0.058	0.015	L	0.046	L	0.042	K	0.018	K	0.031	K	0.014	K				
7440-02-0	**NICKEL**	15.4	38	10.2		11.8		10.7		13.3		7.5		7.8					
7440-09-7	POTASSIUM	1470	NA	977		1380		1920 [BKG]		1940 [BKG]		963		800					
7782-49-2	SELENIUM	1.2	0.52	0.033	UL	0.10	L	0.065	U	0.065	U	0.14	J	0.12	J				
7440-22-4	SILVER	0.84	4.2	0.081	U	0.081	U	0.082	U	0.083	U	0.081	U	0.083	U				
7440-23-5	SODIUM	120	NA	20.3	K	33	K	47.3	K	41.6	K	24.5	K	21.5	K				
7440-24-6	STRONTIUM	NA	120	4.9	K	5.7	K	7.3	K	6.8	K	5.2	K	4.9	K				
7440-31-5	TIN	NA	0.89	0.82	U	0.81	U	0.82	U	0.83	U	0.81	U	0.83	U				
7440-62-2	VANADIUM	53.3	7.8	26.2 [PAL] [MDRES] [SSL]	K	25.2 [PAL] [MDRES] [SSL]	K	33.7 [PAL] [MDRES] [SSL]	K	32.7 [PAL] [MDRES] [SSL]	K	21.8 [PAL] [MDRES] [SSL]	K	16.7 [PAL] [MDRES] [SSL]	K				
7440-66-6	**ZINC**	37.5	46	29.4		31.9		32.4		39.4 [BKG]		23.6		24.5					
	Miscellaneous Parameters																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																		
TTNUS288	PERCENT MOISTURE (%)																		
TTNUS002	PH (S.U.)	**8.8**																	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																	
TTNUS046	TOTAL SOLIDS (%)	**79.2**																	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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	parameter			column2		column4		column6		column8		column10		column12		column14		column16		column18	
	nsample			X05SB0010204		X05SB0010406		X05SB0020204		X05SB0020406		X05SB0030204		X05SB0030406		X05SB0040204		X05SB0040406		X05SB0050204	
	location			X05SB001		X05SB001		X05SB002		X05SB002		X05SB003		X05SB003		X05SB004		X05SB004		X05SB005	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0010204		X05SB0010406		X05SB0020204		X05SB0020406		X05SB0030204		X05SB0030406		X05SB0040204		X05SB0040406		X05SB0050204	
	gis_date			20100315		20100315		20100315		20100315		20100314		20100314		20100314		20100314		20100315	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			001		003		005		007		009		011		013		015		017	
cas	x	utl95conv	minorpal	c_001		c_003		c_005		c_007		c_009		c_011		c_013		c_015		c_017	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
3552-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
99-99-0	4-NITROTOLUENE	NA	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
2691-41-0	HMX	NA	380	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	U	0.18	UL
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.18	U
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.2	UJ	0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	UJ	0.18	U
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	35400	7700	16100 [PAL] [ORNL] [MDRES]		12700 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]		24400 [PAL] [ORNL] [MDRES]		30400 [PAL] [ORNL] [MDRES]		**38900 [BKG] [PAL] [ORNL] [MDRES]**		19300 [PAL] [ORNL] [MDRES]		**50800 [BKG] [PAL] [ORNL] [MDRES]**		14000 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.064	UL	0.065	UL	0.066	UL	0.064	UL	0.065	UL	0.065	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	5.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	5.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	0.71 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	**BARIUM**	134	330	71.3	L	24.9	L	84.8	L	95.8	L	80.9	L	83.6	L	75.9	L	**354 [BKG] [PAL] [SSL]**	L	72.4	L
7440-41-7	BERYLLIUM	3.3	16	0.89	J	0.56	J	0.79	J	1	L	0.86	J	0.93	J	0.71		1.8		0.67	J
7440-43-9	**CADMIUM**	0.61	0.36	0.16	U	0.17	U	0.16	U	0.17	U	0.16	U	0.16	U	0.082	U	0.081	U	0.16	U
7440-70-2	CALCIUM	2590	NA	194	L	68.1		261	L	131	L	280	L	290	L	256	L	1340	L	232	L
7440-47-3	CHROMIUM	60.1	26	27 [PAL] [SSL]	L	10.5		26.9 [PAL] [SSL]	L	28.9 [PAL] [SSL]	L	30.9 [PAL] [SSL]		34.6 [PAL] [SSL]		16.8		42 [PAL] [SSL]		19.3	L
7440-48-4	COBALT	133	2.3	4.3 [PAL] [ORNL]	J	2.3	L	13.6 [PAL] [ORNL] [SSL]	L	11.4 [PAL] [ORNL]	L	7.8 [PAL] [ORNL]	L	12.9 [PAL] [ORNL]	L	13.6 [PAL] [ORNL] [SSL]	L	6 [PAL] [ORNL]	L	14.8 [PAL] [ORNL] [SSL]	L
7440-50-8	COPPER	48.6	28	12.2	L	5		12.2	L	14	L	10.2	L	10.1	L	8.3	L	17.9	L	7.1	L
7439-89-6	IRON	83100	5500	27500 [PAL] [ORNL] [MDRES]		15400 [PAL] [ORNL] [MDRES]		23700 [PAL] [ORNL] [MDRES]		30400 [PAL] [ORNL] [MDRES]		29400 [PAL] [ORNL] [MDRES]		30700 [PAL] [ORNL] [MDRES]		14700 [PAL] [ORNL] [MDRES]		10700 [PAL] [ORNL] [MDRES]		15400 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	9.6	L	5		13.2 [PAL] [SSL]	L	18.8 [PAL] [SSL]	L	11.9 [PAL] [SSL]	L	13.3 [PAL] [SSL]	L	10.4	L	15.5 [PAL] [SSL]	L	13.3 [PAL] [SSL]	L
7439-93-2	**LITHIUM**	NA	2	**15.2 [PAL] [OPLNT]**	L	**7.4 [PAL] [OPLNT]**		**23 [PAL] [ORNL] [OPLNT]**	L	**33 [PAL] [ORNL] [OPLNT]**	L	**24.1 [PAL] [ORNL] [OPLNT]**	L	**24.3 [PAL] [ORNL] [OPLNT]**	L	**13.8 [PAL] [OPLNT]**	L	**41 [PAL] [ORNL] [OPLNT]**	L	**15 [PAL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	2000		686		1890		2420		2210		2170		1040		2740 [BKG]		1230	
7439-96-5	MANGANESE	4130	160	40		30.6	K	300 [PAL] [ORNL] [MDRES] [SSL]		197 [PAL] [ORNL] [MDRES]		127		218 [PAL] [ORNL] [MDRES]		722 [PAL] [ORNL] [MDRES] [SSL]		165 [PAL] [MDRES]		598 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	MERCURY	0.18	0.058	0.0069	UL	0.0069	U	0.028	J	0.015	J	0.043	K	0.046	K	0.025	J	0.073 [PAL] [BTAG]	K	0.022	J
7440-02-0	NICKEL	18.2	38	13	J	5.8	K	16.6	L	20 [BKG]	J	16.7	J	17	J	12	L	25 [BKG]	L	12.7	J
7440-09-7	POTASSIUM	2610	NA	2590	K	784	L	2260	K	3020 [BKG]	K	2150		2350		1270		4180 [BKG]		1380	K
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	U	0.16	UL	0.16	UL	0.066	UL	0.064	UL	0.065	UL	0.065	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.16	UL	0.17	U	0.16	UL	0.17	UL	0.16	U	0.16	U	0.082	U	0.12	J	0.16	UL
7440-23-5	SODIUM	258	NA	93.9	K	25.9	J	64.3	K	108	K	108	L	108	L	27.5	L	184	L	39.2	J
7440-24-6	STRONTIUM	NA	120	10.6	L	3.9		9.3	L	10.4	L	10.6		11.1		7.5		27.6		7.2	L
7440-31-5	**TIN**	NA	0.89	1.6	UL	1.7	U	1.6	UL	1.7	U	1.6	U	1.6	U	0.82	U	**1.5 [PAL] [BTAG]**	J	1.7	UL
7440-62-2	VANADIUM	194	7.8	36.9 [PAL] [MDRES] [SSL]	J	14.4 [PAL] [MDRES] [SSL]		40.9 [PAL] [ORNL] [MDRES] [SSL]	J	43.3 [PAL] [ORNL] [MDRES] [SSL]	J	54.6 [PAL] [ORNL] [MDRES] [SSL]		58.8 [PAL] [ORNL] [MDRES] [SSL]		28.7 [PAL] [MDRES] [SSL]		63.1 [PAL] [ORNL] [MDRES] [SSL]		29.7 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	37.5	L	17.5		50.3 [PAL] [SSL]	L	58 [PAL] [SSL]	L	51.4 [PAL] [SSL]	L	52.3 [PAL] [SSL]	L	33.9	L	**78.7 [BKG] [PAL] [SSL]**	L	39.3	L
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA					35.1		55.3											
TTNUS288	PERCENT MOISTURE (%)	NA	NA					20.2		19.5											
TTNUS002	PH (s.u.)	NA	NA					4.8		4.63											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA					2060	L	1450	L										
TTNUS046	TOTAL SOLIDS (%)	NA	NA					79.8		80.5											

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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	parameter			column20		column22		column23		column25		column28		column30		column32		column34		column36	
	nsample			X05SB0050406		X05SB0060204		X05SB0060204-AVG		X05SB0060204-D		X05SB0060406		X05SB0070204		X05SB0070406		X05SB0080204		X05SB0080406	
	location			X05SB005		X05SB006		X05SB006		X05SB006		X05SB006		X05SB007		X05SB007		X05SB008		X05SB008	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0050406		X05SB0060204		X05SB0060204-AVG		FD031510-01		X05SB0060406		X05SB0070204		X05SB0070406		X05SB0080204		X05SB0080406	
	gis_date			20100315		20100315		20100315		20100315		20100315		20100315		20100315		20100315		20100315	
	qc_type			NM		NM		NM		FD		NM		NM		NM		NM		NM	
	sacode			NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate									X05SB0060204											
	top_depth			4.00		2.00		2.00		2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			6.00		4.00		4.00		4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			019		021		022		024		027		029		031		033		035	
cas	x	utl95conv	minorpal	c_019		c_021		c_022		c_024		c_027		c_029		c_031		c_033		c_035	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.245	U	0.24	U	0.25	U	0.24	U	0.24	U	0.24	U	0.24	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.245	U	0.24	U	0.25	U	0.24	U	0.24	U	0.24	U	0.24	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.195	UL	0.19	UL	0.2	UL	0.19	UL	0.19	UL	0.19	UL	0.19	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.195	UJ	0.19	UJ	0.2	U	0.19	UJ	0.19	UJ	0.19	UJ	0.19	UJ
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	35400	7700	20400 [PAL] [ORNL] [MDRES]		33700 [PAL] [ORNL] [MDRES]		30900 [PAL] [ORNL] [MDRES]		28100 [PAL] [ORNL] [MDRES]		14700 [PAL] [ORNL] [MDRES]		21300 [PAL] [ORNL] [MDRES]		22900 [PAL] [ORNL] [MDRES]		16900 [PAL] [ORNL] [MDRES]		20600 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.049	UL	0.066	UL	0.033	UL	0.033	UL	0.066	UL	0.032	UL	0.032	UL
7440-38-2	ARSENIC	18.9	0.026	3.8 [PAL] [ORNL] [MDRES] [MDSGW]		3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.6 [PAL] [ORNL] [MDRES] [MDSGW]		2.7 [PAL] [ORNL] [MDRES] [MDSGW]		3.2 [PAL] [ORNL] [MDRES] [MDSGW]		3.3 [PAL] [ORNL] [MDRES] [MDSGW]		2.9 [PAL] [ORNL] [MDRES] [MDSGW]		3.3 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	**BARIUM**	134	330	81.4	L	40.3	L	49.95	L	59.6	L	40.6	L	93.3	L	73.3	L	71.4	L	33.5	L
7440-41-7	BERYLLIUM	3.3	.16	0.93	J	0.76	J	0.83	J	0.9	J	0.56	J	0.97	J	0.86	J	0.83	J	0.4	J
7440-43-9	**CADMIUM**	0.61	0.36	0.17	U	0.17	U	0.165	U	0.16	U	0.17	U	0.17	U	0.17	U	0.16	U	0.083	U
7440-70-2	CALCIUM	2590	NA	275	L	87.7		104.35	L	121	L	111	L	263	L	203	L	351	L	178	L
7440-47-3	CHROMIUM	60.1	26	27.8 [PAL] [SSL]	L	22.9		25.35	L	27.8 [PAL] [SSL]	L	19.3	L	28.8 [PAL] [SSL]	L	27.1 [PAL] [SSL]	L	26.4 [PAL] [SSL]	L	14.6	L
7440-48-4	COBALT	133	2.3	12 [PAL] [ORNL]	L	4.7 [PAL] [ORNL]	L	5.4 [PAL] [ORNL]	L	6.1 [PAL] [ORNL]	L	6.1 [PAL] [ORNL]	L	15.2 [PAL] [ORNL] [SSL]	L	13.9 [PAL] [ORNL] [SSL]	L	11.8 [PAL] [ORNL]	L	4.1 [PAL] [ORNL]	L
7440-50-8	COPPER	48.6	28	11.4	L	13.5		13.65	L	13.8	L	10.1	L	11	L	13.1	L	11.6	L	5.9	L
7439-89-6	IRON	83100	5500	25600 [PAL] [ORNL] [MDRES]		27900 [PAL] [ORNL] [MDRES]		27950 [PAL] [ORNL] [MDRES]		28000 [PAL] [ORNL] [MDRES]		17900 [PAL] [ORNL] [MDRES]		22700 [PAL] [ORNL] [MDRES]		25400 [PAL] [ORNL] [MDRES]		23800 [PAL] [ORNL] [MDRES]		12800 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	12.5 [PAL] [SSL]	L	10.6		10.7	L	10.8	L	9.2	L	13.2 [PAL] [SSL]	L	11.5 [PAL] [SSL]	L	11.2 [PAL] [SSL]	L	12 [PAL] [SSL]	L
7439-93-2	**LITHIUM**	NA	2	**20.2 [PAL] [ORNL] [OPLNT]**	L	**17.2 [PAL] [ORNL] [OPLNT]**		**19.55 [PAL] [ORNL] [OPLNT]**	L	**21.9 [PAL] [ORNL] [OPLNT]**	L	**14.7 [PAL] [OPLNT]**	L	**20.4 [PAL] [ORNL] [OPLNT]**	L	**21.5 [PAL] [ORNL] [OPLNT]**	L	**19.5 [PAL] [ORNL] [OPLNT]**	L	**9 [PAL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	3010 [BKG]		1500		1665		1830		1170		2060		2450		2650 [BKG]		1420	
7439-96-5	MANGANESE	4130	160	300 [PAL] [ORNL] [MDRES] [SSL]		68	K	77.9	K	87.8		95.6		664 [PAL] [ORNL] [MDRES] [SSL]		349 [PAL] [ORNL] [MDRES] [SSL]		369 [PAL] [ORNL] [MDRES] [SSL]		105	
7439-97-6	MERCURY	0.18	0.058	0.007	UL	0.014	U	0.0125	J	0.018	J	0.018	J	0.036	J	0.039	J	0.02	L	0.016	J
7440-02-0	NICKEL	18.2	38	18.8 [BKG]	J	13		14.2	L	15.4	L	10.9	L	17.4	L	16.3	L	16	L	7.7	J
7440-09-7	POTASSIUM	2610	NA	1820	K	1390	J	2055	J	2720 [BKG]	J	1720	J	2200	K	2070	K	2120	K	983	K
7782-49-2	SELENIUM	13.3	0.52	0.17	UL	0.16	U	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.17	UL	0.17	U	0.165	UL	0.16	UL	0.17	UL	0.17	UL	0.17	UL	0.16	UL	0.083	UL
7440-23-5	SODIUM	258	NA	64.9	K	31.4	J	49	J	66.6	K	41.3	J	66.1	K	92.3	K	168	K	94.3	K
7440-24-6	STRONTIUM	NA	120	9.8	L	5.5		7.15	L	8.8	L	6.1	L	10	L	8.9	L	10.4	L	5.2	L
7440-31-5	**TIN**	NA	0.89	1.7	U	1.7	U	1.65	UL	1.6	UL	1.7	UL	1.7	UL	1.7	UL	1.7	UL	0.83	UL
7440-62-2	VANADIUM	194	7.8	45.4 [PAL] [ORNL] [MDRES] [SSL]	J	29.7 [PAL] [MDRES] [SSL]		33.45 [PAL] [MDRES] [SSL]	J	37.2 [PAL] [MDRES] [SSL]	J	25.7 [PAL] [MDRES] [SSL]	J	44.2 [PAL] [ORNL] [MDRES] [SSL]	J	44.4 [PAL] [ORNL] [MDRES] [SSL]	J	42.3 [PAL] [ORNL] [MDRES] [SSL]	J	21.9 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	51.8 [PAL] [SSL]	L	35.5		37.5	L	39.5	L	30.6	L	50.4 [PAL] [SSL]	L	48.2 [PAL] [SSL]	L	42.1	L	21	L
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (s.u.)	NA	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																		
TTNUS046	TOTAL SOLIDS (%)	NA	NA																		

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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	parameter			column38		column40		column42		column44		column46		column48		column50		column52		column54	
	nsample			X05SB0090204		X05SB0090406		X05SB0100204		X05SB0100406		X05SB0110204		X05SB0110406		X05SB0120204		X05SB0120406		X05SB0130204	
	location			X05SB009		X05SB009		X05SB010		X05SB010		X05SB011		X05SB011		X05SB012		X05SB012		X05SB013	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0090204		X05SB0090406		X05SB0100204		X05SB0100406		X05SB0110204		X05SB0110406		X05SB0120204		X05SB0120406		X05SB0130204	
	gis_date			20100314		20100315		20100315		20100315		20100315		20100315		20100314		20100314		20100314	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			037		039		041		043		045		047		049		051		053	
cas	x	utl95conv	minorpal	c_037		c_039		c_041		c_043		c_045		c_047		c_049		c_051		c_053	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	35400	7700	31500 [PAL] [ORNL] [MDRES]		**37700 [BKG] [PAL] [ORNL] [MDRES]**		32500 [PAL] [ORNL] [MDRES]		28700 [PAL] [ORNL] [MDRES]		**41600 [BKG] [PAL] [ORNL] [MDRES]**		**35600 [BKG] [PAL] [ORNL] [MDRES]**		29000 [PAL] [ORNL] [MDRES]		18400 [PAL] [ORNL] [MDRES]		29800 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.032	UL	0.033	UL	0.032	UL	0.032	UL	0.033	UL	0.032	UL	0.065	UL	0.066	UL
7440-38-2	ARSENIC	18.9	0.026	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.1 [PAL] [ORNL] [MDRES] [MDSGW]	L	3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.4 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	**BARIUM**	134	330	63.3		63.2		76.3		74.8		58.6		83.8		59.9	L	49.4	L	79.2	L
7440-41-7	BERYLLIUM	3.3	16	0.7	J	0.87	J	0.78	J	0.79		0.73	J	0.85		0.67	J	0.58		0.98	
7440-43-9	**CADMIUM**	0.61	0.36	0.17	U	0.16	U	0.16	U	0.083	U	0.32	J	0.083	U	0.16	U	0.081	U	0.16	U
7440-70-2	CALCIUM	2590	NA	235		354		140		193		143		191		192	L	77	L	274	L
7440-47-3	CHROMIUM	60.1	26	27 [PAL] [SSL]		24.6		27.1 [PAL] [SSL]		24.4		26.5 [PAL] [SSL]		24.9		22.5		17.8		27.9 [PAL] [SSL]	
7440-48-4	COBALT	133	2.3	3.1 [PAL] [ORNL]	L	6.4 [PAL] [ORNL]		4.5 [PAL] [ORNL]		6.6 [PAL] [ORNL]		6.4 [PAL] [ORNL]		9.6 [PAL] [ORNL]		9.8 [PAL] [ORNL]	L	4.6 [PAL] [ORNL]	L	8 [PAL] [ORNL]	L
7440-50-8	COPPER	48.6	28	13.4		13.6		12.2		13.4		14.1		13.2		12.1	L	8.8	L	13.5	L
7439-89-6	IRON	83100	5500	18200 [PAL] [ORNL] [MDRES]		23000 [PAL] [ORNL] [MDRES]		21300 [PAL] [ORNL] [MDRES]		14000 [PAL] [ORNL] [MDRES]		20700 [PAL] [ORNL] [MDRES]		15100 [PAL] [ORNL] [MDRES]		20300 [PAL] [ORNL] [MDRES]		17100 [PAL] [ORNL] [MDRES]		24900 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	10.9		13.3 [PAL] [SSL]		11.2 [PAL] [SSL]		10.6		13.3 [PAL] [SSL]		12.1 [PAL] [SSL]		9.8	L	8.8	L	12.2 [PAL] [SSL]	L
7439-93-2	**LITHIUM**	NA	2	**23.2 [PAL] [ORNL] [OPLNT]**		**23 [PAL] [ORNL] [OPLNT]**		**21.6 [PAL] [ORNL] [OPLNT]**		**21.8 [PAL] [ORNL] [OPLNT]**		**23.2 [PAL] [ORNL] [OPLNT]**		**28.3 [PAL] [ORNL] [OPLNT]**		**18.4 [PAL] [ORNL] [OPLNT]**	L	**14.3 [PAL] [OPLNT]**	L	**24.5 [PAL] [ORNL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	1520		2170		1650		2220		2390		2500		2120		1210		2480	
7439-96-5	MANGANESE	4130	160	42.9	K	91.5	K	30	K	47.4	K	57.3	K	84.9	K	191 [PAL] [ORNL] [MDRES]		133		143	
7439-97-6	MERCURY	0.18	0.058	0.04	K	0.026	K	0.011	J	0.0076	J	0.0068	U	0.0075	J	0.021	J	0.014	U	0.014	U
7440-02-0	NICKEL	18.2	38	10.1		15.4		11.4		15.2		15.2		19.2 [BKG]		13.9	L	9.9	L	17.1	L
7440-09-7	POTASSIUM	2610	NA	2950 [BKG]	L	2140	L	2660 [BKG]	L	2220	L	1930	L	2780 [BKG]	L	1730		1580		3120 [BKG]	
7782-49-2	SELENIUM	13.3	0.52	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.064	UL	0.033	UL	0.066	UL
7440-22-4	SILVER	11.4	4.2	0.17	U	0.16	U	0.16	U	0.083	U	0.16	U	0.083	U	0.16	U	0.081	U	0.16	U
7440-23-5	SODIUM	258	NA	77.1		53.5		93.1		98.5		72.8		112		68.3	L	78.9	L	73.1	L
7440-24-6	STRONTIUM	NA	120	13.2		12.8		11.3		10.9		9.2		13.7		7.8		5.3		12.1	
7440-31-5	**TIN**	NA	0.89	1.7	U	1.7	U	1.7	U	0.83	U	1.6	U	0.83	U	1.6	U	0.81	U	1.6	U
7440-62-2	VANADIUM	194	7.8	39.1 [PAL] [ORNL] [MDRES] [SSL]		33.7 [PAL] [MDRES] [SSL]		37.7 [PAL] [MDRES] [SSL]		31.1 [PAL] [MDRES] [SSL]		33.7 [PAL] [MDRES] [SSL]		34.2 [PAL] [MDRES] [SSL]		39.4 [PAL] [ORNL] [MDRES] [SSL]		30.7 [PAL] [MDRES] [SSL]		42.1 [PAL] [ORNL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	27.8		52.5 [PAL] [SSL]		31.9		45.7		43.8		59.5 [PAL] [SSL]		38.9	L	27.6	L	45.9	L
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (s.u.)	NA	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																		
TTNUS046	TOTAL SOLIDS (%)	NA	NA																		

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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	parameter			column56		column58		column60		column62		column64		column66		column68		column70		column72	
	nsample			X05SB0130406		X05SB0140204		X05SB0140406		X05SB0150204		X05SB0150406		X05SB0160204		X05SB0160406		X05SB0170204		X05SB0170406	
	location			X05SB013		X05SB014		X05SB014		X05SB015		X05SB015		X05SB016		X05SB016		X05SB017		X05SB017	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0130406		X05SB0140204		X05SB0140406		X05SB0150204		X05SB0150406		X05SB0160204		X05SB0160406		X05SB0170204		X05SB0170406	
	gis_date			20100314		20100314		20100314		20100314		20100314		20100314		20100314		20100314		20100314	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			6.00		4.00		4.00		4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			055		057		059		061		063		065		067		069		071	
cas	x	utl95conv	minorpal	c_055		c_057		c_059		c_061		c_063		c_065		c_067		c_069		c_071	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	0.12	J	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	35400	7700	9500 [PAL] [ORNL] [MDRES]		27600 [PAL] [ORNL] [MDRES]		27800 [PAL] [ORNL] [MDRES]		18000 [PAL] [ORNL] [MDRES]		32900 [PAL] [ORNL] [MDRES]		34400 [PAL] [ORNL] [MDRES]		25700 [PAL] [ORNL] [MDRES]		29700 [PAL] [ORNL] [MDRES]		22700 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.033	UL	0.033	UL	0.033	UL	0.032	UL	0.032	UL	0.066	UL	0.065	UL
7440-38-2	ARSENIC	18.9	0.026	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	5.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.9 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	**BARIUM**	134	33	45.9		70.5		41.9		42		52.6		192 [BKG]	L	136 [BKG]	L	73.5	L	61.3	L
7440-41-7	BERYLLIUM	3.3	16	0.82	J	0.88	J	0.59	J	0.56		0.8	J	1.2		1.1	J	0.87	J	0.77	J
7440-43-9	**CADMIUM**	0.61	0.36	0.16	U	0.17	U	0.17	U	0.083	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
7440-70-2	CALCIUM	2590	NA	119		606		273		440		163		349	L	306	L	122	L	143	L
7440-47-3	CHROMIUM	60.1	26	28.3 [PAL] [SSL]		26.8 [PAL] [SSL]		22.6		17.4		23.1		31.3 [PAL] [SSL]		31.4 [PAL] [SSL]		23.5		21.1	
7440-48-4	COBALT	133	2.3	12.1 [PAL] [ORNL]		8.9 [PAL] [ORNL]		4.4 [PAL] [ORNL]		6.2 [PAL] [ORNL]		22.3 [PAL] [ORNL] [SSL]		9.1 [PAL] [ORNL]	L	7.4 [PAL] [ORNL]	L	18 [PAL] [ORNL] [SSL]	L	8.9 [PAL] [ORNL]	L
7440-50-8	COPPER	48.6	28	14.3		15.2		12.2		9.2		11.7		18	L	16.4	L	12.3	L	11.2	L
7439-89-6	IRON	83100	5500	24100 [PAL] [ORNL] [MDRES]		19400 [PAL] [ORNL] [MDRES]		22600 [PAL] [ORNL] [MDRES]		15600 [PAL] [ORNL] [MDRES]		24700 [PAL] [ORNL] [MDRES]		21700 [PAL] [ORNL] [MDRES]		20700 [PAL] [ORNL] [MDRES]		24400 [PAL] [ORNL] [MDRES]		28600 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	7.8		12.1 [PAL] [SSL]		9.4		8.5		14.1 [PAL] [SSL]		14 [PAL] [SSL]	L	14.4 [PAL] [SSL]	L	12.3 [PAL] [SSL]	L	9.8	L
7439-93-2	**LITHIUM**	NA	2	**16.1 [PAL] [ORNL] [OPLNT]**		**23.9 [PAL] [ORNL] [OPLNT]**		**18.5 [PAL] [ORNL] [OPLNT]**		**14.7 [PAL] [OPLNT]**		**17 [PAL] [ORNL] [OPLNT]**		**35.3 [PAL] [ORNL] [OPLNT]**	L	**33.4 [PAL] [ORNL] [OPLNT]**	L	**22.7 [PAL] [ORNL] [OPLNT]**	L	**17.5 [PAL] [ORNL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	1710		2160		1010		1010		1560		2630		2450		1870		2050	
7439-96-5	MANGANESE	4130	160	216 [PAL] [ORNL] [MDRES]	K	130	K	65.3	K	77.7	K	521 [PAL] [ORNL] [MDRES] [SSL]	K	54.7		42.7		439 [PAL] [ORNL] [MDRES] [SSL]		258 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	MERCURY	0.18	0.058	0.011	J	0.039	K	0.042	K	0.015	J	0.021	K	0.017	J	0.012	J	0.014	U	0.014	U
7440-02-0	NICKEL	18.2	38	12.7		16		8.2		9.9		13.3	K	20.9 [BKG]	L	18	L	17.9	L	14.1	J
7440-09-7	POTASSIUM	2610	NA	2470	L	2420	L	1810	L	1440	L	1780	L	2980 [BKG]		3290 [BKG]		2240		1880	
7782-49-2	SELENIUM	13.3	0.52	0.033	U	0.032	U	0.033	U	0.033	U	0.16	U	0.065	UL	0.064	UL	0.066	UL	0.065	UL
7440-22-4	SILVER	11.4	4.2	0.16	U	0.17	U	0.17	U	0.083	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
7440-23-5	SODIUM	258	NA	43	J	163		58		33.5		47.8	J	465 [BKG]	L	381 [BKG]	L	102	L	248	L
7440-24-6	STRONTIUM	NA	120	6.3		11.8		7.6		5.6		7.2		13.5		13.9		8.9		8.5	
7440-31-5	**TIN**	NA	0.89	1.6	U	1.7	U	1.7	U	0.83	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U
7440-62-2	VANADIUM	194	7.8	39 [PAL] [MDRES] [SSL]		35 [PAL] [MDRES] [SSL]		29.2 [PAL] [MDRES] [SSL]		26.8 [PAL] [MDRES] [SSL]		34.3 [PAL] [MDRES] [SSL]		41.7 [PAL] [ORNL] [MDRES] [SSL]		42 [PAL] [ORNL] [MDRES] [SSL]		38 [PAL] [MDRES] [SSL]		29.8 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	39.8		47 [PAL] [SSL]		24.5		30		36.4		67.1 [PAL] [SSL]	L	50.6 [PAL] [SSL]	L	45.8	L	39	L
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (s.u.)	NA	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																		
TTNUS046	TOTAL SOLIDS (%)	NA	NA																		

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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	parameter			column74		column76		column78		column80		column82		column84		column86		column88		column90	
	nsample			X05SB0180204		X05SB0180406		X05SB0190204		X05SB0190406		X05SB0200204		X05SB0200406		X05SB0210204		X05SB0210406		X05SB0220204	
	location			X05SB018		X05SB018		X05SB019		X05SB019		X05SB020		X05SB020		X05SB021		X05SB021		X05SB022	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0180204		X05SB0180406		X05SB0190204		X05SB0190406		X05SB0200204		X05SB0200406		X05SB0210204		X05SB0210406		X05SB0220204	
	gis_date			20100314		20100314		20100314		20100314		20100315		20100315		20100315		20100315		20100314	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		ORIG	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			073		075		077		079		081		083		085		087		089	
cas	x	utl95conv	minorpal	c_073		c_075		c_077		c_079		c_081		c_083		c_085		c_087		c_089	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24	U	0.24	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.11	J	0.05	J	0.19	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24	U	0.24	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UL	0.19	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	35400	7700	**43600 [BKG] [PAL] [ORNL] [MDRES]**		30600 [PAL] [ORNL] [MDRES]		24400 [PAL] [ORNL] [MDRES]		31900 [PAL] [ORNL] [MDRES]		9170 [PAL] [ORNL] [MDRES]		12200 [PAL] [ORNL] [MDRES]		15800 [PAL] [ORNL] [MDRES]		3320		16400 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.032	UL	0.033	UL	0.033	UL	0.059	J	0.033	UL	0.032	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.7 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	0.61 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	**BARIUM**	134	330	98.1		71.9		64.4		63.7		41.8	L	57.6	L	30.9		54.8		112	L
7440-41-7	BERYLLIUM	3.3	16	1.3		0.72		0.83	J	0.76	J	0.72	L	0.66	L	0.4	J	0.56		1	
7440-43-9	**CADMIUM**	0.61	0.36	0.17	U	0.081	U	0.16	U	0.17	U	0.56 [PAL] [SSL]	J	**8.5 [BKG] [PAL] [ORNL] [MDRES] [SSL]**	J	0.083	U	0.38 [PAL] [SSL]	K	0.16	U
7440-70-2	CALCIUM	2590	NA	300		302		429		284		2130	L	1490	L	763		720		314	L
7440-47-3	CHROMIUM	60.1	26	29.1 [PAL] [SSL]		21.9		25.6		30.3 [PAL] [SSL]		16.2	L	18.4	L	13.9		15.9		27.2 [PAL] [SSL]	
7440-48-4	COBALT	133	2.3	15.1 [PAL] [ORNL] [SSL]		6.3 [PAL] [ORNL]		10.4 [PAL] [ORNL]		9.4 [PAL] [ORNL]		6.4 [PAL] [ORNL]	L	8.8 [PAL] [ORNL]	L	5.3 [PAL] [ORNL]		7.9 [PAL] [ORNL]		14.6 [PAL] [ORNL] [SSL]	L
7440-50-8	COPPER	48.6	28	13.4		11.9		12.3		13.4		19.8	L	19.2	L	13.6		25.2		11.5	L
7439-89-6	IRON	83100	5500	21200 [PAL] [ORNL] [MDRES]		12300 [PAL] [ORNL] [MDRES]		23200 [PAL] [ORNL] [MDRES]		20400 [PAL] [ORNL] [MDRES]		13300 [PAL] [ORNL] [MDRES]		14500 [PAL] [ORNL] [MDRES]		13200 [PAL] [ORNL] [MDRES]		11900 [PAL] [ORNL] [MDRES]		22300 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	11.2 [PAL] [SSL]		8.5		11.1 [PAL] [SSL]		9.2		11.6 [PAL] [SSL]	L	12.7 [PAL] [SSL]	L	9.9		21.4 [PAL] [SSL]		13.7 [PAL] [SSL]	L
7439-93-2	**LITHIUM**	NA	2	**31.1 [PAL] [ORNL] [OPLNT]**		**24.4 [PAL] [ORNL] [OPLNT]**		**21.3 [PAL] [ORNL] [OPLNT]**		**21.4 [PAL] [ORNL] [OPLNT]**		**8.7 [PAL] [OPLNT]**	L	**13.4 [PAL] [OPLNT]**	L	**11.6 [PAL] [OPLNT]**		**13.1 [PAL] [OPLNT]**		**21.5 [PAL] [ORNL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	2930 [BKG]		2210		1930		2060		955		1310		730		972		1530	
7439-96-5	MANGANESE	4130	160	207 [PAL] [ORNL] [MDRES]	K	69.2	K	154	K	170 [PAL] [MDRES]	K	64.8		184 [PAL] [ORNL] [MDRES]		79	K	119	K	616 [PAL] [ORNL] [MDRES] [SSL]	J
7439-97-6	MERCURY	0.18	0.058	0.0076	J	0.013	J	0.019	K	0.011	J	0.043	J	0.04	J	0.014	J	0.013	J	0.025	J
7440-02-0	NICKEL	18.2	38	20.5 [BKG]		17.8		15.5		20.3 [BKG]		11.2	L	12	L	7.8		9.8		17.1	L
7440-09-7	POTASSIUM	2610	NA	3640 [BKG]	L	2270	L	2360	L	2070	L	1080	K	1420	K	1030	L	1420	L	2600	
7782-49-2	SELENIUM	13.3	0.52	0.16	U	0.16	U	0.16	U	0.16	U	0.033	UL	0.16	UL	0.16	U	0.032	U	0.065	UL
7440-22-4	SILVER	11.4	4.2	0.17	U	0.081	U	0.16	U	0.17	U	0.083	U	0.082	UL	0.083	U	0.082	U	0.16	U
7440-23-5	SODIUM	258	NA	260 [BKG]		190		60.5		59.3		36.6	K	39.7	K	21.5	J	36.3		60.7	L
7440-24-6	STRONTIUM	NA	120	16		12.2		10.7		7.9		10.8	L	10	L	5.1		7.2		12	
7440-31-5	**TIN**	NA	0.89	1.7	U	0.81	U	1.6	U	1.7	U	0.83	UL	0.82	U	0.83	U	0.83	U	1.6	U
7440-62-2	VANADIUM	194	7.8	40.7 [PAL] [ORNL] [MDRES] [SSL]		26.9 [PAL] [MDRES] [SSL]		39.9 [PAL] [ORNL] [MDRES] [SSL]		31.5 [PAL] [MDRES] [SSL]		28.6 [PAL] [MDRES] [SSL]	J	30 [PAL] [MDRES] [SSL]	J	20.7 [PAL] [MDRES] [SSL]		24.4 [PAL] [MDRES] [SSL]		42 [PAL] [ORNL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	60.7 [PAL] [SSL]		52.4 [PAL] [SSL]		40.9		41		35.9	L	63.8 [PAL] [SSL]	L	37.4		42.8		46.1 [PAL] [SSL]	L
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (s.u.)	NA	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																		
TTNUS046	TOTAL SOLIDS (%)	NA	NA																		

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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	parameter			column91		column93		column96		column98		column100		column102		column104		column106	
	nsample			X05SB0220204-AVG		X05SB0220204-D		X05SB0220406		X05SB0230204		X05SB0230406		X05SB0240204		X05SB0240406		X05SB0250204	
	location			X05SB022		X05SB022		X05SB022		X05SB023		X05SB023		X05SB024		X05SB024		X05SB025	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0220204-AVG		FD031410-02		X05SB0220406		X05SB0230204		X05SB0230406		X05SB0240204		X05SB0240406		X05SB0250204	
	gis_date			20100314		20100314		20100314		20100314		20100314		20100315		20100315		20100315	
	qc_type			NM		FD		NM		NM		NM		NM		NM		NM	
	sacode			AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate					X05SB0220204													
	top_depth			2.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			4.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB	
	z			090		092		095		097		099		101		103		105	
cas	x	utl95conv	minorpal	c_090		c_092		c_095		c_097		c_099		c_101		c_103		c_105	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	U	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	0.084	J	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	UJ
	Inorganics (mg/kg)																		
7429-90-5	**ALUMINUM**	35400	7700	15350 [PAL] [ORNL] [MDRES]		14300 [PAL] [ORNL] [MDRES]		19100 [PAL] [ORNL] [MDRES]		20100 [PAL] [ORNL] [MDRES]		22200 [PAL] [ORNL] [MDRES]		12000 [PAL] [ORNL] [MDRES]		17500 [PAL] [ORNL] [MDRES]		22600 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.0325	UL	0.032	UL	0.033	UL	0.033	UL	0.065	UL	0.064	UL	0.065	UL	0.063	UL
7440-38-2	ARSENIC	18.9	0.026	2.3 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	J	4 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	4 [PAL] [ORNL] [MDRES] [MDSGW]		3.7 [PAL] [ORNL] [MDRES] [MDSGW]		3.3 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	**BARIUM**	134	330	98	L	84	L	53.5	L	58.6	L	72.2	L	35.1	L	39.5	L	64.1	L
7440-41-7	BERYLLIUM	3.3	16	0.95	J	0.9	J	0.54	J	0.81	J	0.88	J	0.59	J	0.65	J	0.81	J
7440-43-9	**CADMIUM**	0.61	0.36	0.165	U	0.17	U	0.16	U	0.16	U	0.16	U	0.17	U	0.16	U	0.16	U
7440-70-2	CALCIUM	2590	NA	325	L	336		130	L	171	L	194	L	108	L	131	L	218	L
7440-47-3	CHROMIUM	60.1	26	28.05 [PAL] [SSL]		28.9 [PAL] [SSL]		23		26.2 [PAL] [SSL]		26.6 [PAL] [SSL]		21.5	L	23.9	L	24.6	L
7440-48-4	COBALT	133	2.3	11.75 [PAL] [ORNL]	L	8.9 [PAL] [ORNL]		4.2 [PAL] [ORNL]	L	13 [PAL] [ORNL]	L	13.2 [PAL] [ORNL] [SSL]	L	6.4 [PAL] [ORNL]	L	23.5 [PAL] [ORNL] [SSL]	L	12.2 [PAL] [ORNL]	L
7440-50-8	COPPER	48.6	28	13	L	14.5		11.5	L	11.4	L	12.6	L	9.5	L	10	L	11	L
7439-89-6	IRON	83100	5500	24550 [PAL] [ORNL] [MDRES]		26800 [PAL] [ORNL] [MDRES]		20400 [PAL] [ORNL] [MDRES]		20700 [PAL] [ORNL] [MDRES]		23300 [PAL] [ORNL] [MDRES]		15500 [PAL] [ORNL] [MDRES]		17000 [PAL] [ORNL] [MDRES]		22500 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	13.35 [PAL] [SSL]	L	13 [PAL] [SSL]		8	L	10.7	L	11.3 [PAL] [SSL]	L	8.5	L	9.8	L	10.7	L
7439-93-2	**LITHIUM**	NA	2	**23.4 [PAL] [ORNL] [OPLNT]**	L	**25.3 [PAL] [ORNL] [OPLNT]**		**16.6 [PAL] [ORNL] [OPLNT]**	L	**19.3 [PAL] [ORNL] [OPLNT]**	L	**22.5 [PAL] [ORNL] [OPLNT]**	L	**13.8 [PAL] [OPLNT]**	L	**14 [PAL] [OPLNT]**	L	**18.5 [PAL] [ORNL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	1645		1760		1110		1690		2360		1090		1210		1890	
7439-96-5	MANGANESE	4130	160	452 [PAL] [ORNL] [MDRES] [SSL]	J	288 [PAL] [ORNL] [MDRES] [SSL]	J	49.1		293 [PAL] [ORNL] [MDRES] [SSL]		327 [PAL] [ORNL] [MDRES] [SSL]		54.5		211 [PAL] [ORNL] [MDRES]		248 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	MERCURY	0.18	0.058	0.0142	J	0.0068	U	0.022	J	0.0083	J	0.014	U	0.0075	J	0.011	J	0.028	J
7440-02-0	NICKEL	18.2	38	17.05	L	17		8.8	L	13.8	L	18.7 [BKG]	L	8.6	L	10.7	L	15.4	L
7440-09-7	POTASSIUM	2610	NA	2615 [BKG]	L	2630 [BKG]	L	2380		2290		1930		1410	K	1530	K	1960	K
7782-49-2	SELENIUM	13.3	0.52	0.0485	UL	0.032	U	0.033	UL	0.065	UL	0.065	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.165	UL	0.17	UL	0.16	U	0.16	U	0.16	U	0.17	UL	0.16	UL	0.16	UL
7440-23-5	SODIUM	258	NA	68.05	L	75.4		49.2	J	66.7	L	116	L	32.8	J	39.7	J	57.1	K
7440-24-6	STRONTIUM	NA	120	12.25		12.5		7.8		8.5		8.7	L	5.1	L	5.4	L	8.4	L
7440-31-5	**TIN**	NA	0.89	1.65	UL	1.7	UL	1.6	U	1.6	U	1.6	U	1.7	UL	1.6	UL	1.6	UL
7440-62-2	VANADIUM	194	7.8	41.75 [PAL] [ORNL] [MDRES] [SSL]		41.5 [PAL] [ORNL] [MDRES] [SSL]		34.3 [PAL] [MDRES] [SSL]		38.9 [PAL] [MDRES] [SSL]		40.8 [PAL] [ORNL] [MDRES] [SSL]		27 [PAL] [MDRES] [SSL]	J	30.1 [PAL] [MDRES] [SSL]	J	39.5 [PAL] [ORNL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	45.35	L	44.6		27	L	38.4	L	49.1 [PAL] [SSL]	L	26.6	L	29.5	L	43.5	L
	Miscellaneous																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																
TTNUS288	PERCENT MOISTURE (%)	NA	NA																
TTNUS002	PH (s.u.)	NA	NA																
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																
TTNUS046	TOTAL SOLIDS (%)	NA	NA																

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column108		column109		column111	
	nsample			X05SB0250406		X05SB0250406-AVG		X05SB0250406-D	
	location			X05SB025		X05SB025		X05SB025	
	project_no			00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0250406		X05SB0250406-AVG		FD031510-02	
	gis_date			20100315		20100315		20100315	
	qc_tyge			NM		NM		FD	
	sacode			ORIG		AVG		DUP	
	matrix			SO		SO		SO	
	duplicate							X05SB0250406	
	top_depth			4.00		4.00		4.00	
	bottom_dep			6.00		6.00		6.00	
	depth_unit			FT		FT		FT	
	submatrix			SB		SB		SB	
	z			107		108		110	
cas	x	utl95conv	minorpal	c_107		c_108		c_110	
	Explosives (mg/kg)								
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.195	U	0.19	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.195	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.245	U	0.24	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.195	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.195	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.195	U	0.19	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.195	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.245	U	0.24	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.195	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.195	U	0.19	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.195	U	0.19	U
2691-41-0	HMX	NA	380	0.2	UL	0.195	UL	0.19	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.195	U	0.19	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.195	U	0.19	U
479-45-8	TETRYL	NA	24	0.2	UJ	0.195	UJ	0.19	U
	Inorganics (mg/kg)								
7429-90-5	**ALUMINUM**	35400	7700	13100 [PAL] [ORNL] [MDRES]	J	19200 [PAL] [ORNL] [MDRES]	J	25300 [PAL] [ORNL] [MDRES]	J
7440-36-0	ANTIMONY	1.8	0.27	0.066	UL	0.0655	UL	0.065	UL
7440-38-2	ARSENIC	18.9	0.026	3.3 [PAL] [ORNL] [MDRES] [MDSGW]		3.2 [PAL] [ORNL] [MDRES] [MDSGW]		3.1 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	**BARIUM**	134	330	63.7	L	57.9	L	52.1	L
7440-41-7	BERYLLIUM	3.3	16	0.73	J	0.68	J	0.63	J
7440-43-9	**CADMIUM**	0.61	0.36	0.17	U	0.165	U	0.16	U
7440-70-2	CALCIUM	2590	NA	161	L	143.5	L	126	L
7440-47-3	CHROMIUM	60.1	26	24.9	L	22.85	L	20.8	L
7440-48-4	COBALT	133	2.3	8.3 [PAL] [ORNL]	L	8.7 [PAL] [ORNL]	L	9.1 [PAL] [ORNL]	L
7440-50-8	COPPER	48.6	28	10.9	L	10.55	L	10.2	L
7439-89-6	IRON	83100	5500	22000 [PAL] [ORNL] [MDRES]		21200 [PAL] [ORNL] [MDRES]		20400 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	10	L	9.75	L	9.5	L
7439-93-2	**LITHIUM**	NA	2	**19.7 [PAL] [ORNL] [OPLNT]**	L	**18.55 [PAL] [ORNL] [OPLNT]**	L	**17.4 [PAL] [ORNL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	1900		1790		1680	
7439-96-5	MANGANESE	4130	160	194 [PAL] [ORNL] [MDRES]		204 [PAL] [ORNL] [MDRES]		214 [PAL] [ORNL] [MDRES]	
7439-97-6	MERCURY	0.18	0.058	0.013	J	0.0135	J	0.014	J
7440-02-0	NICKEL	18.2	38	14.6	L	13.75	L	12.9	L
7440-09-7	POTASSIUM	2610	NA	1980	K	1660	K	1340	K
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.17	UL	0.165	UL	0.16	U
7440-23-5	SODIUM	258	NA	68.7	K	58.25	J	47.8	J
7440-24-6	STRONTIUM	NA	120	7.6	L	6.7	L	5.8	L
7440-31-5	**TIN**	NA	0.89	1.7	UL	1.65	UL	1.6	U
7440-62-2	VANADIUM	194	7.8	37.3 [PAL] [MDRES] [SSL]	J	34.65 [PAL] [MDRES] [SSL]	J	32 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	40.3	L	38.45	L	36.6	L
	Miscellaneous								
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA						
TTNUS288	PERCENT MOISTURE (%)	NA	NA						
TTNUS002	PH (s.u.)	NA	NA						
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA						
TTNUS046	TOTAL SOLIDS (%)	NA	NA						

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

P:/GIS/INDIANHEAD_NSWC_NEW/MAPDOCS/MXD/SN_ADVANCED_IED_MEC.MXD 5/28/10 KM

1244000 1244500 1245000 1245500 1246000

322000 321500 321000

Open Area
(2.5 foot line spacing)

Berm Area
(5 foot line spacing)

Archer Avenue

Parker Road

Porter Avenue

Inset Area

Berm

Open Area

SWMU 27
IR Site 65

UXO Detector-Aided Sweep
(50-foot line spacing shown)
Follow-up Detector-Aided Sweep and
Geophysical Survey of Selected Anomalies

Geophysical Survey
(2.5-foot line spacing - open berm)
(5-foot spacing - berm area)

100% UXO Detector-Aided Sweep

N

150 75 0 150
Feet

Legend

- MRP Area Boundary Identified During PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	8/24/07
CHECKED BY	DATE
E. BERKLITE	5/28/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

ADVANCED IED AREA (UXO-5)
MEC INVESTIGATION LOCATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 7-1	0

P:/GIS/INDIANHEAD_NSWC_NEW/MXD/SN_ADVANCED_IED_MEC_FINDS.MXD 5/7/10 KM

1244500 1245000 1245500

321500

Open Area

Archer Avenue

Parker Road

Inset Area

Berm

Open Area

SWMU 27
IR Site 65

15 20 25 30 10

N

Legend

- Munitions Debris
- MPPEH
- MRP Area Boundary Identified During PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

100 50 0 100 Feet

DRAWN BY K. MOORE	DATE 8/24/07
CHECKED BY E. BERKLITE	DATE 5/7/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

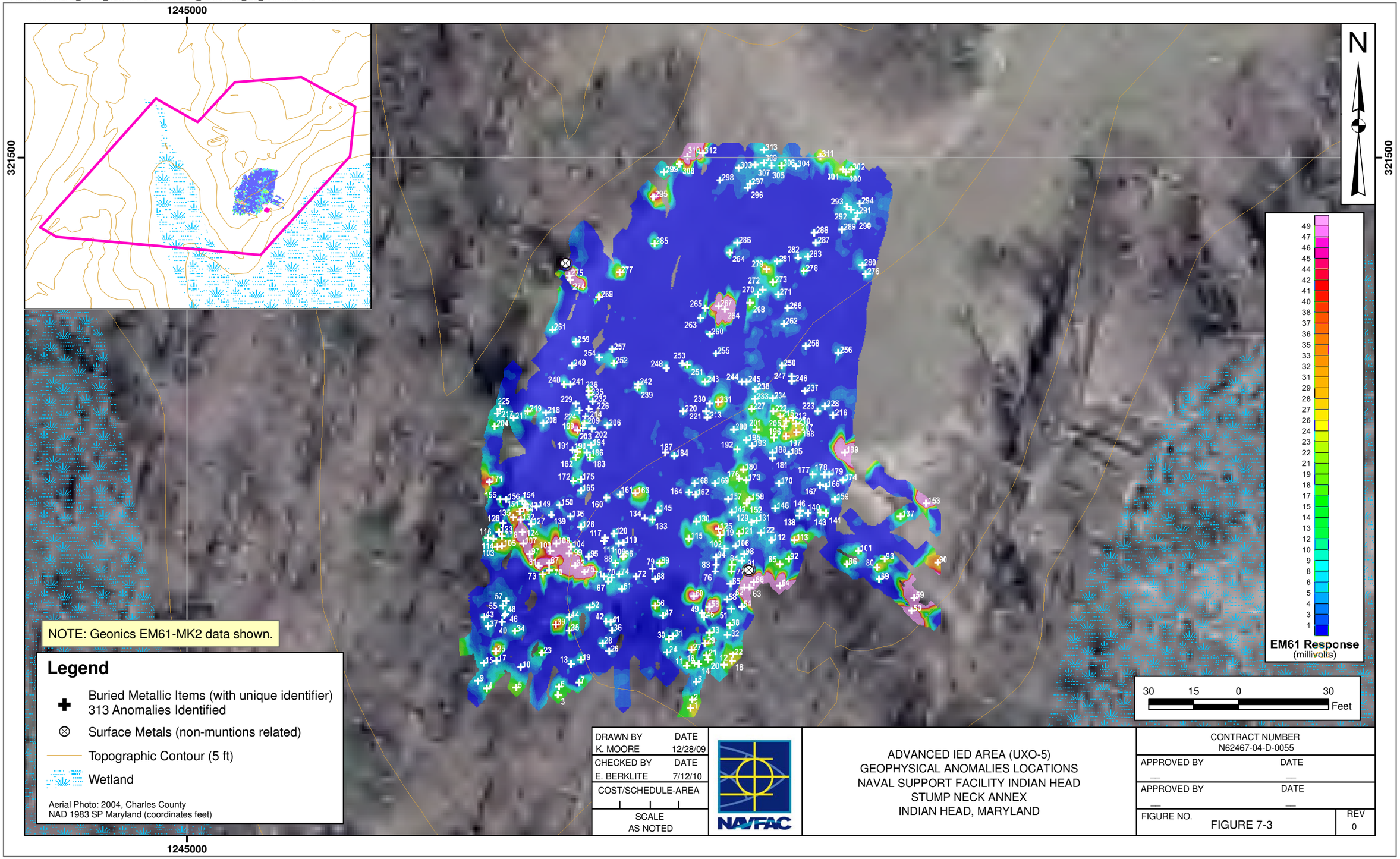
ADVANCED IED AREA (UXO-5)
MEC FINDS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055	
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 7-2	REV 0

1244500 1245000 1245500

321500

P:/GIS/INDIANHEAD_NSWC_NEW/MAPDOCS/MXD/SN_ADVANCED_IED_MAG.MXD 7/12/10 KM



DRAWN BY	DATE
K. MOORE	12/28/09
CHECKED BY	DATE
E. BERKLITE	7/12/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

ADVANCED IED AREA (UXO-5)
GEOPHYSICAL ANOMALIES LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	
N62467-04-D-0055	
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 7-3	0

P:/GIS/INDIANHEAD_NSWC_NEW/MXD/SN_ADVANCED_IED_SAMPLING.MXD 7/9/10 KM

1244500 1245000 1245500

321500

N

Archer Avenue

Parker Road

Open Area

Inset Area

Berm

SWMU 27
IR Site 65

X05SB001 X05SB002 X05SB003 X05SB003D X05SB004 X05SB005 X05SB006 X05SB007 X05SB008 X05SB009 X05SB010 X05SB011 X05SB012 X05SB013 X05SB014 X05SB015 X05SB016 X05SB017 X05SB018 X05SB019 X05SB020 X05SB021 X05SB022 X05SB023 X05SB023S X05SB024 X05SB025

NOTE: Geonics EM61-MK2 data shown.

Legend

- Soil Sample Location
- Munitions Debris
- MPPEH
- MRP Area Boundary Identified During PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

EM61 Response (millivolts)
49 47 46 45 44 42 41 40 38 37 36 35 33 32 31 29 28 27 26 24 23 22 21 19 18 17 15 14 13 12 10 9 8 6 5 4 3 1

100 50 0 100 Feet

DRAWN BY K. MOORE	DATE 8/24/07
CHECKED BY E. BERKLITE	DATE 7/9/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

ADVANCED IED AREA (UXO-5)
SAMPLE LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 7-4	0

1244500 1245000 1245500

P:/GIS/INDIANHEAD_NSWC_NEW/MXD/SN_ADVANCED_IED_SS_TAGS.MXD 7/9/10 KM

1244500 1245000 1245500

321500

Archer Avenue

Parker Road

X05SB001 (DUP)
Depth = 0 - 0.5'
Inorganics (mg/kg)
ZINC 47.7 [BKG] [PAL] [SSL]
X05SB001
Depth = 0 - 2'
Inorganics (mg/kg)
ZINC 51.9 [BKG] [PAL] [SSL]

X05SB002
Depth = 0 - 2'
Inorganics (mg/kg)
ALUMINUM 12400 [BKG] [PAL] [ORNL] [MDRES] [SSL]
ZINC 53.6 [BKG] [PAL] [SSL]

X05SB004
Depth = 0 - 0.5'
Inorganics (mg/kg)
ZINC 46.6 [BKG] [PAL] [SSL]
Depth = 0 - 2'
ALUMINUM 20300 [BKG] [PAL] [ORNL] [MDRES] [SSL]

X05SB006
Depth = 0 - 0.5'
Inorganics (mg/kg)
ZINC 50 [BKG] [PAL] [SSL]
Depth = 0 - 2'
ALUMINUM 20600 [BKG] [PAL] [ORNL] [MDRES] [SSL]

X05SB005
NO EXC

X05SB007
Depth = 0 - 0.5'
Inorganics (mg/kg)
COPPER 38.6 [BKG] [PAL] [SSL]
MERCURY 0.18 [BKG] [PAL] [BTAG]

X05SB003
Depth = 0 - 0.5'
Inorganics (mg/kg)
ZINC 73.6 [BKG] [PAL] [SSL]
Depth = 0 - 2'
MANGANESE 1700 [BKG] [PAL] [ORNL] [MDRES] [MDSGW] [SSL]
ZINC 61 [BKG] [PAL] [SSL]
X05SB003 (DUP)
Depth = 0 - 2'
Inorganics (mg/kg)
MANGANESE 1640 [BKG] [PAL] [ORNL] [MDRES] [MDSGW] [SSL]
ZINC 54 [BKG] [PAL] [SSL]

X05SB008
Depth = 0 - 0.5'
Inorganics (mg/kg)
ZINC 52.6 [BKG] [PAL] [SSL]

X05SB009
Depth = 0 - 0.5'
Inorganics (mg/kg)
MERCURY 0.93 [BKG] [PAL] [BTAG]
Depth = 0 - 2'
ARSENIC 15.7 [BKG] [PAL] [ORNL] [MDRES] [MDSGW]
MERCURY 0.48 [BKG] [PAL] [BTAG]

X05SB014
Depth = 0 - 0.5'
Inorganics (mg/kg)
NICKEL 230 [BKG] [PAL] [ORNL] [MDRES] [SSL]
Depth = 0 - 2'
NICKEL 73 [BKG] [PAL] [SSL]

X05SB010
Depth = 0 - 0.5'
Inorganics (mg/kg)
MERCURY 1.2 [BKG] [PAL] [BTAG]
Depth = 0 - 2'
MERCURY 0.38 [BKG] [PAL] [BTAG]

X05SB012
Depth = 0 - 0.5'
Inorganics (mg/kg)
ZINC 46.8 [BKG] [PAL] [SSL]
Depth = 0 - 2'
ZINC 51.1 [BKG] [PAL] [SSL]

X05SB011
Depth = 0 - 2'
Inorganics (mg/kg)
COPPER 35.7 [BKG] [PAL] [SSL]

X05SB013
NO EXC

X05SB018
NO EXC

X05SB015
Depth = 0 - 0.5
Explosives (mg/kg)
NITROGLYCERIN 0.94 J [PAL] [ORNL]

X05SB016
NO EXC

X05SB017
NO EXC

X05SB021
NO EXC

X05SB022
Depth= 0 - 0.5
Inorganics (mg/kg)
ZINC 55.9 [BKG] [PAL] [SSL]
Depth = 0 - 2'
ZINC 51.4 [BKG] [PAL] [SSL]

X05SB019
Depth= 0 - 0.5
Inorganics (mg/kg)
COPPER 60.1 [BKG] [PAL] [SSL]
Depth = 0 - 2'
COPPER 53.8 [BKG] [PAL] [SSL]

X05SB020
Depth= 0 - 0.5
Inorganics (mg/kg)
MERCURY 0.21 [BKG] [PAL] [BTAG]
Depth = 0 - 2'
MERCURY 0.39 [BKG] [PAL] [BTAG]

X05SB023
NO EXC

X05SB025
NO EXC

X05SB024
NO EXC

N

100 50 0 100
Feet

Legend

- Soil Boring Location
- MRP Area Boundary Identified During PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	5/25/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

ADVANCED IED AREA (UXO-5)
SURFACE SOIL METALS EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055		
APPROVED BY —	DATE —	
APPROVED BY —	DATE —	
FIGURE NO. FIGURE 7-5		REV 0

P:/GIS/INDIANHEAD_NSWC_NEW/MXD/SN_ADVANCED_IED_SS_TAGS.MXD 7/9/10 KM

1244500 1245000 1245500

321500

X05SB001
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 15.2 L [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 7.4 [PAL] [OPLNT]

X05SB002
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 23 L [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 33 L [PAL] [ORNL] [OPLNT]
POTASSIUM 3020 K [BKG]

X05SB003
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 24.1 L [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
ALUMINUM 38900 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 24.3 L [PAL] [ORNL] [OPLNT]

X05SB004
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 13.8 L [PAL] [OPLNT]
Depth = 4.00 - 6.00'
ALUMINUM 50800 [BKG] [PAL] [ORNL] [MDRES]
BARIUM 354 L [BKG] [PAL] [SSL]
LITHIUM 41 L [PAL] [ORNL] [OPLNT]
POTASSIUM 4180 [BKG]
TIN 1.5 J [PAL] [BTAG]
ZINC 78.7 L [BKG] [PAL] [SSL]

X05SB005
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 15 L [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 20.2 L [PAL] [ORNL] [OPLNT]

X05SB006
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 17.2 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 14.7 L [PAL] [OPLNT]
X05SB006 (DUP)
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 21.9 L [PAL] [ORNL] [OPLNT]
POTASSIUM 2720 J [BKG]

X05SB007
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 20.4 L [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 21.5 L [PAL] [ORNL] [OPLNT]

X05SB008
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 19.5 L [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 9 L [PAL] [OPLNT]

X05SB009
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 23.2 [PAL] [ORNL] [OPLNT]
POTASSIUM 2950 L [BKG]
Depth = 4.00 - 6.00'
ALUMINUM 37700 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 23 [PAL] [ORNL] [OPLNT]

X05SB010
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 21.6 [PAL] [ORNL] [OPLNT]
POTASSIUM 2660 L [BKG]
Depth = 4.00 - 6.00'
LITHIUM 21.8 [PAL] [ORNL] [OPLNT]

X05SB011
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
ALUMINUM 41600 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 23.2 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
ALUMINUM 35600 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 28.3 [PAL] [ORNL] [OPLNT]
POTASSIUM 2780 L [BKG]

X05SB012
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 18.4 L [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 14.3 L [PAL] [OPLNT]

X05SB013
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 24.5 L [PAL] [ORNL] [OPLNT]
POTASSIUM 3120 [BKG]
Depth = 4.00 - 6.00'
LITHIUM 16.1 [PAL] [ORNL] [OPLNT]

X05SB014
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 23.9 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 18.5 [PAL] [ORNL] [OPLNT]

X05SB015
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 14.7 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 17 [PAL] [ORNL] [OPLNT]

X05SB016
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 35.3 L [PAL] [ORNL] [OPLNT]
POTASSIUM 2980 [BKG]
SODIUM 465 L [BKG]
Depth = 4.00 - 6.00'
LITHIUM 33.4 L [PAL] [ORNL] [OPLNT]
POTASSIUM 3290 [BKG]
SODIUM 381 L [BKG]

X05SB017
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 22.7 L [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 17.5 L [PAL] [ORNL] [OPLNT]

X05SB018
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
ALUMINUM 43600 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 31.1 [PAL] [ORNL] [OPLNT]
POTASSIUM 3640 L [BKG]
SODIUM 260 [BKG]
Depth = 4.00 - 6.00'
LITHIUM 24.4 [PAL] [ORNL] [OPLNT]

X05SB019
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 21.3 [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 21.4 [PAL] [ORNL] [OPLNT]

X05SB020
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 8.7 L [PAL] [OPLNT]
Depth = 4.00 - 6.00'
CADMIUM 8.5 J [BKG] [PAL] [ORNL] [MDRES] [SSL]
LITHIUM 13.4 L [PAL] [OPLNT]

X05SB021
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 11.6 [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 13.1 [PAL] [OPLNT]

X05SB022
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 21.5 L [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 16.6 L [PAL] [ORNL] [OPLNT]
X05SB022 (DUP)
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 25.3 [PAL] [ORNL] [OPLNT]
POTASSIUM 2630 L [BKG]

X05SB023
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 19.3 L [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 22.5 L [PAL] [ORNL] [OPLNT]

X05SB024
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 13.8 L [PAL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 14 L [PAL] [OPLNT]

X05SB025
Depth = 2.00 - 4.00'
Inorganics (mg/kg)
LITHIUM 18.5 L [PAL] [ORNL] [OPLNT]
Depth = 4.00 - 6.00'
LITHIUM 19.7 L [PAL] [ORNL] [OPLNT]
X05SB025 (DUP)
Depth = 4.00 - 6.00'
Inorganics (mg/kg)
LITHIUM 17.4 L [PAL] [ORNL] [OPLNT]

Other Avenue
Parker Road

25 30 20

N

100 50 0 100 Feet

Legend

- Soil Boring Sample Location
- MRP Area Boundary Identified During PA
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	5/25/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

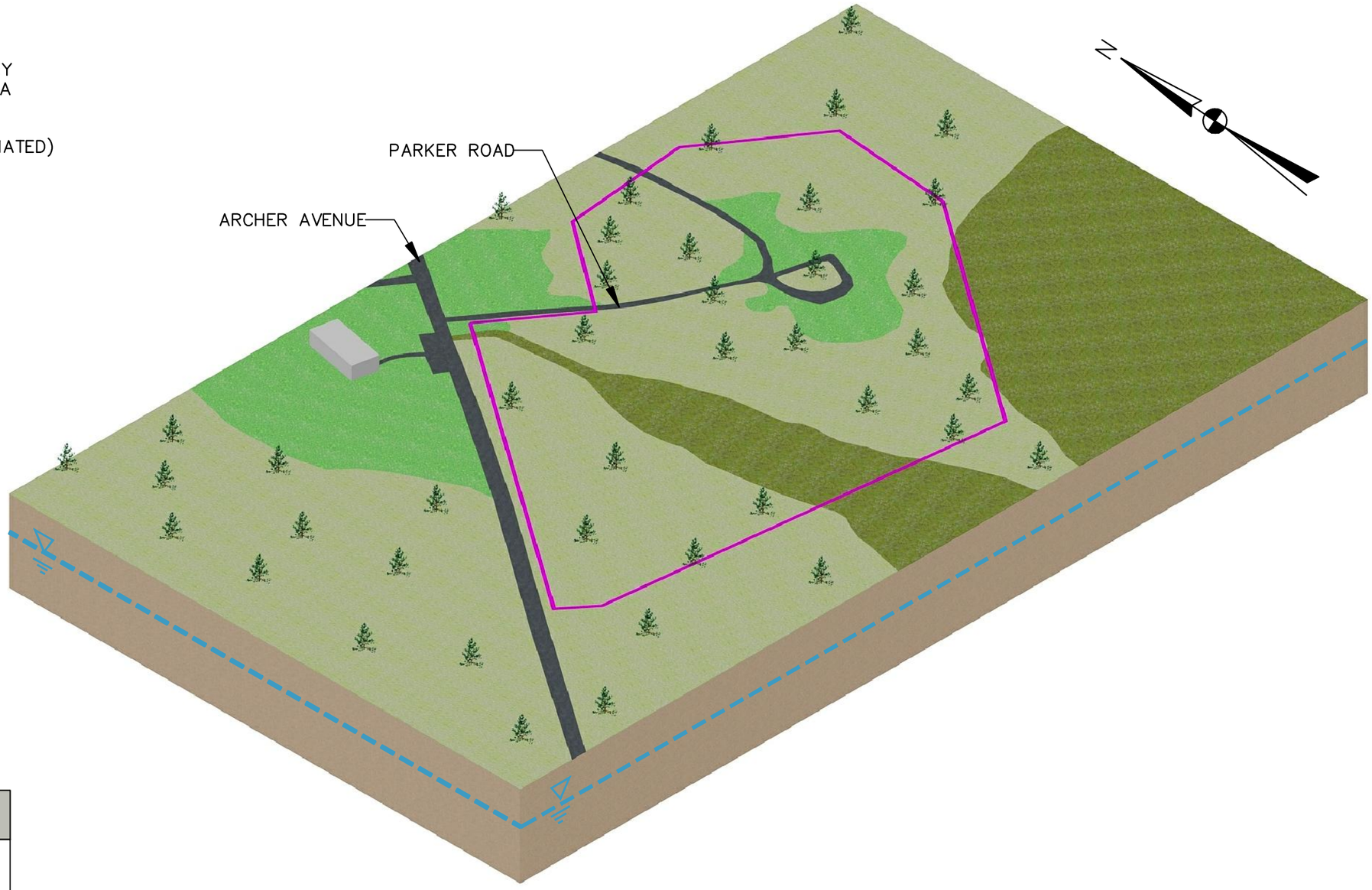
NAVFAC

ADVANCED IED AREA (UXO-5)
SUBSURFACE SOIL METALS EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055	
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 7-6	REV 0

LEGEND

- MRP AREA BOUNDARY IDENTIFIED DURING PA
- WATER TABLE (ESTIMATED)
- BUILDINGS
- TREE
- GRASS
- PAVED ROAD
- FOREST
- WETLANDS



CURRENT AND FUTURE RECEPTORS FOR STUMP NECK IMPACT AREA
HUMAN: –MILITARY/CIVILIAN PERSONNEL –CONTRACTORS –TRESPASSERS
ECOLOGICAL: –PLANTS –INVERTEBRATES –BIRDS –MAMMALS

DRAWN BY ND	DATE 6–16–10	ADVANCED IED (UXO–05) CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND	CONTRACT NO. 0810
CHECKED BY	DATE		OWNER NO.
REVISED BY	DATE		APPROVED BY DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 7–7 / REV. 0

R:\0810\CSM\0810CSM015.dwg PIT NICHOLE.DILLA 7/1/2010 8:03:19 AM

FIGURE 7-8A

MEC EXPOSURE PATHWAY ANALYSIS

ADVANCED IED AREA UXO 05

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

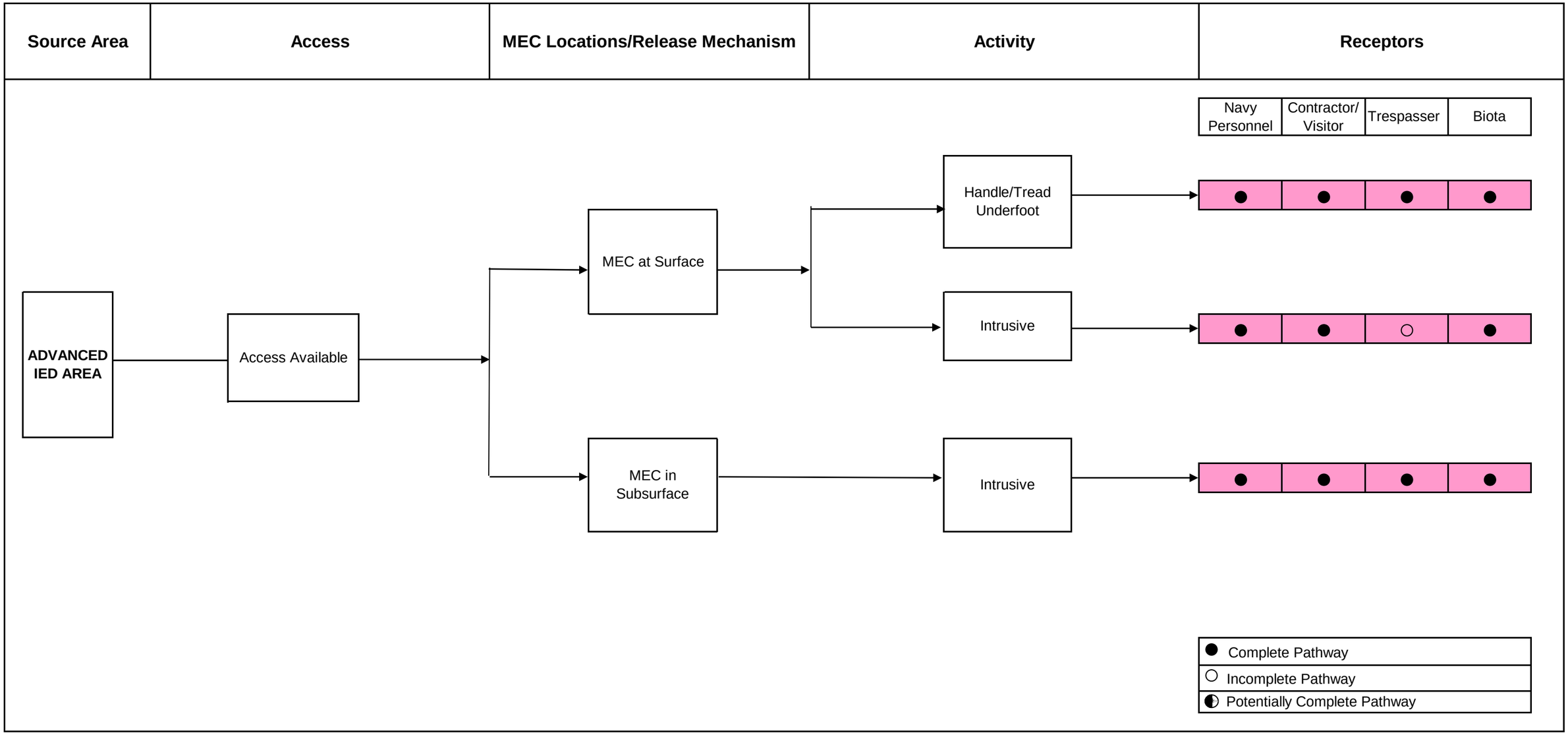
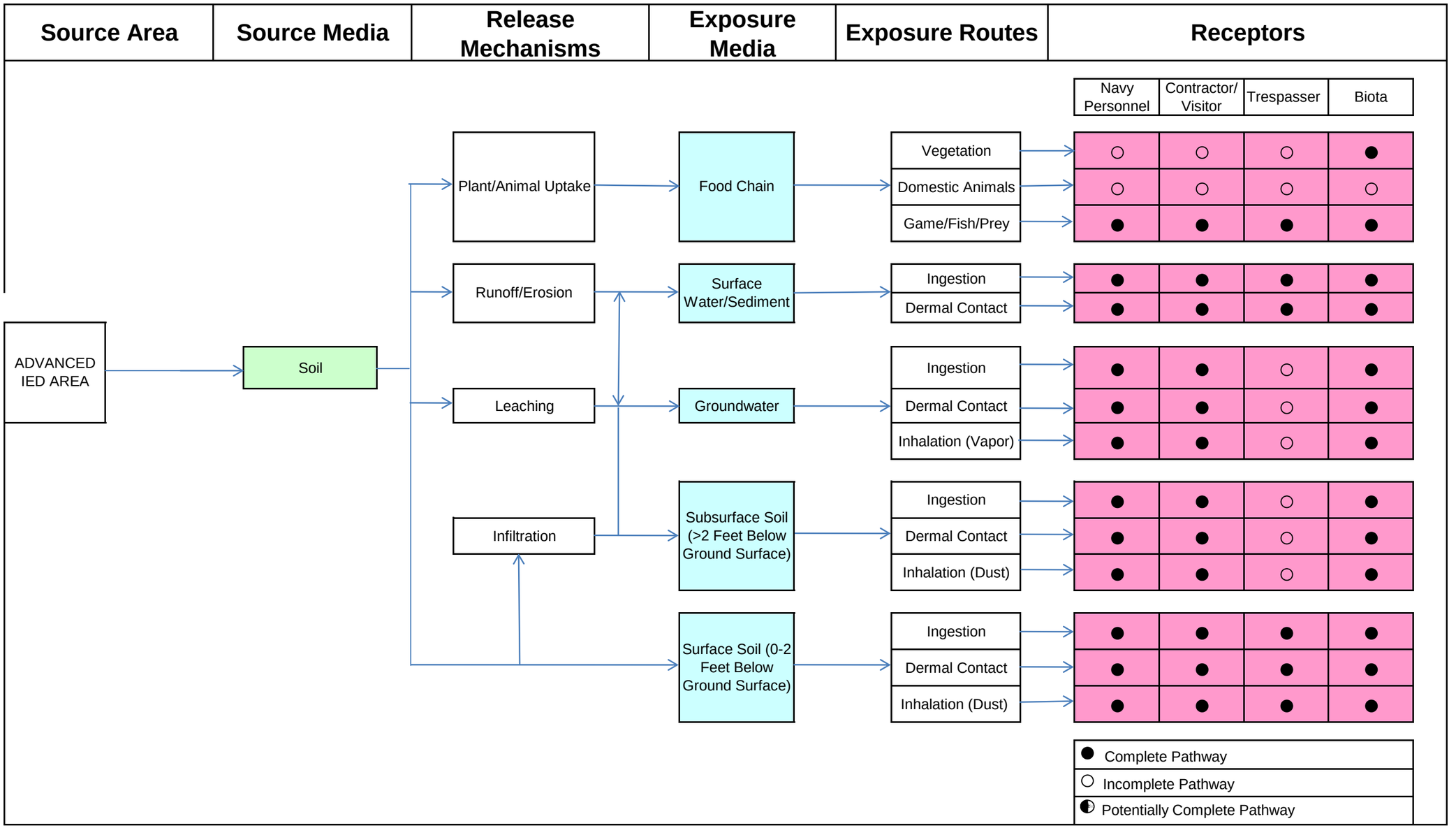


FIGURE 7-8B

MC EXPOSURE PATHWAY ANALYSIS

ADVANCED IED AREA UXO 04

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



8.0 STUMP NECK IMPACT AREA – UXO-10

8.1 LOCATION AND SETTING

The Stump Neck Impact Area is a 32.9-acre range located in the central portion of Stump Neck Annex. The range was initially identified as SWMU 23 in the 1983 IAS and in a 1990 draft RCRA Facility Assessment (RFA). The range has since been identified as IR Site #30. Sources indicate the area was once a target/impact area for several firing activities.

8.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

There are no buildings in close proximity to the Stump Neck Impact Area. There is no evidence of any former structures at the range. There is no evidence of utilities in use in the Stump Neck Impact Area. There is no additional information about this range's land use other than as an impact area and munitions testing area. According to the Installation, there are no planned future activities at the range.

8.3 TOPOGRAPHY

The impact area is a wetland composed of scattered vegetation, tidal pools, and marsh. Surrounding hydrologic features and drainage patterns suggest a slight slope from north to south.

8.4 GEOLOGY

Site-specific geology was classified for Stumpneck Impact Area during this SI's shallow surface boring investigation. Soils for the 0 to 6 feet bgs interval was designated as a mixture of silt, clay, and organics, with some very fine sand. As described in Section 2.2.3 - Regional Geology, in most of the study area, the surficial sediments consist of Pleistocene paleochannel deposits and Holocene alluvial and paludal deposits (Hiortdahl, 1997). These deposits consist of gravel, sand, silt, clay, and peat mixtures with irregular bedding and with an aggregate thickness of 0 to approximately 40 feet. No waste material was encountered during the shallow surface investigation. Soil and sediment log sheets are included in Appendix F.6.

8.5 SOIL AND VEGETATION

According to the Soil Survey of Charles County, the soil at the Stump Neck Impact Area is classified as tidal marsh (USDA, 1974). The vegetation at the Stump Neck Impact Area is characterized by heavy

shrubs and small trees. This range is classified by the installation as Palustrine emergent/broad-leaved deciduous scrub-shrub wetland. Hardwood forests surround the range.

SNIA-2. Wetlands at the Stump Neck Impact

8.6 HYDROLOGY

Chicamuxen Creek surrounds the Stump Neck Impact Area. The area is dotted with small pools of standing water and small streams that weave through the marsh. The extent of surface water coverage and level of ground saturation varies with the tidal flow, seasonal climates, and rainfall. Water that does not percolate to groundwater will drain into Chicamuxen Creek and eventually reach the Potomac River.

8.7 HYDROGEOLOGY

There is no range-specific hydrogeology information for the Stump Neck Impact Area; however, groundwater was encountered during the installation of borings immediately below the ground surface within the boundaries of the Stump Neck Impact Area. Surrounding hydrolic features and drainage patterns suggest a slight southerly flow direction.

8.8 WETLANDS

The site encompasses about 33 acres of low-elevation wetlands, tidal pools, and marsh areas surrounded by Chicamuxen Creek in the central portion of Stump Neck Annex. The area is dotted with small pools of standing water and small streams that weave through the marsh. The percentage of surface water coverage and level of ground saturation varies with the tidal flow, seasonal climates, and rainfall. Water that does not percolate to groundwater will drain into Chicamuxen Creek and eventually reach the Potomac River. The wetlands are protected under Executive Order 11990, which prohibits construction in a wetland area unless there is no practicable alternative and all possible measures are taken to minimize the environmental impacts. Wetlands are also protected under Section 404 of the Clean Water Act, which requires a permit to be obtained from USACE before any work in a wetland can commence. The wetland associated with this range is categorized as a Palustrine emergent/broad-leaved deciduous scrub-shrub wetland.

8.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

The Stump Neck Impact Area is within an eagle protection area and a wildlife protection area. According to the 1996 Phase I Cultural Resources Survey of Stump Neck Annex, there are no archeological/cultural sites within the Stump Neck Impact Area.

8.10 HISTORICAL INFORMATION

The Stump Neck Impact Area was used as a long-range naval gunnery target from the early 1890s through the early 1920s and sporadically in the 1930s and 1940s. Historical documentation also indicates that Marine Corps Base Quantico was also permitted to fire large artillery at Stump Neck Annex for several years until 1934. Sources indicate that rockets may also have been fired at the impact area as late as 1947; however, the duration of this activity and the location of the firing point are not known. Information provided by a Navy historian indicates that the Stump Neck Impact Area may have been used to support a variety of other training activities including land surface demolitions testing and underwater demolitions testing prior to the construction of the Area 8 pond in 1957. However, there is no physical or historical evidence to support those assertions.

8.11 MUNITIONS USED

This section describes the munitions and munitions-related materials known or suspected to be present at the range. This includes both MEC and non-hazardous munitions-related debris (e.g., fragmentation, base plates, inert mortar fins). Historical documentation indicates that rockets and various calibers of

guns (1-inch through 16-inch) were proved at the Valley Impact Area, and that several other projectiles ranging from 75-mm to 155-mm were fired from Quantico. These projectiles contained different types of high explosives and explosive fillers including black powder, smokeless powder, brown prismatic powder, emmensite, joveite, wet gun cotton, and randite. No physical evidence of MEC/MC was observed in this area. Based on the information obtained during the data collection process, the Stump Neck Impact Area is not suspected to contain CWM-filled munitions, electrically fuzed munitions, or DU-associated munitions. The estimated ordnance penetration of the munitions fired on the Stump Neck Impact Area (1-inch to 16-inch projectiles) is between 4 and 12 feet bgs.

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 8-1.

8.12 MUNITIONS CONSTITUENTS

No surface or subsurface sampling has been conducted at the Stump Neck Impact Area to determine what specific MC may be present. Potential MC could include metals, various explosives, and various chemicals associated with pyrotechnics, such as perchlorate and propellants. A partial list of known explosives tested in the Valley Impact Area was documented and is as follows:

- 1894 Annual Report - Powder expended during testing: 56,981 pounds.
- 1897 Annual Report - Powder expended during testing: 50,000 pounds, including:
  - Wet gun cotton: 47 pounds.
  - Shell powder: 220.25 pounds.
  - Randite: 4 pounds and 3.2 ounces.
  - Joveite: 10.75 pounds.
  - Picric acid: 2 pounds.
- 1901 Annual Report - Powder: 46 pounds.
- 1901 Annual Report - Powder: 350 pounds.
- 1919 Annual Report - Smokeless powder: 831, 033 pounds.
- 1920 Annual Report - Smokeless powder: 419,607 pounds.

MC commonly found in 75-mm, 37-mm, and 155-mm ammunition include the following:

- TNT
- HMX
- Composition B

- Composition D
- Perchlorate

The relative concentrations of these MC are not known but are not anticipated to exceed 10 percent in soil.

No MC were observed during the visual survey.

8.13 MEC SITE FIELDWORK

8.13.1 Background

The Stump Neck Impact Area is an undeveloped marshy and aquatic site that was used as a target area for artillery (37-mm and larger, and possibly rockets). The site is approximately 33 acres, and the target locations unknown; therefore, a geophysical investigation was conducted using 40-foot-spaced transects to reconnoiter (by foot) the accessible portions of the site identified during the PA. The 40-foot-transect spacing was selected using a visual sample plan (VSP) model (Appendix B) for an assumed 200-foot-radius circular target. The recommended transect spacings of 38 to greater than 73 feet (corresponding to expected target densities above background ranging from 10 to 30 per acre) were calculated using a background density of five per acre to give a 90-percent probability of detection (see VSP model results attached in Appendix B). The survey depth ranged from 0 to 5 feet depending on target size for artillery projectiles, and increased for larger items (more metal mass and diameter).

The MEC site investigation at the Stump Neck Impact Area was limited to detector-aided surface and subsurface geophysical investigations.

The initial horizontal boundary for the MEC investigation was the area within the MRP boundary identified on Figure 8-1 that was accessible by foot and survey instrument. Other areas of wetlands at the site were not investigated.

The initial vertical boundary for the MEC investigation (detector-aided surface sweeps and geophysical investigation) was 1 foot bgs within the accessible land area. The vertical boundary for the geophysical investigation was 0 to 5 feet bgs. The PA indicated that estimated penetration depths for munitions believed to have been fired into this area are between 4 and 12 feet bgs. The Stump Neck Impact Area is overlapped by the firing fan from the Valley located at the Main Installation; therefore, there is the

potential for munitions associated with the Valley to be present in this area. Data from this investigation were also used in the assessment of impacts from munitions fired from the Valley.

8.13.2 Scope

The scope of survey activities at the Stump Neck Impact Area is summarized below (see Figure 8-1).

- Brush and vegetation clearing as necessary to support the detector-aided surface sweeps and geophysical investigation.

- UXO detector-aided surface sweeping of the geophysical survey area.

- Geophysical surveying across portions of the site accessible by foot and instrument, using a planned 40-foot transect spacing.

- Consulting with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate MC UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH IR Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items left in place were avoided during subsequent geophysical surveying. No MEC items were moved or disturbed during this phase of the project. Surface MD were reported on the log sheet and in the logbook for the site.

8.13.3 Site Preparation

Brush cutting and vegetation removal to support the detector-aided surface sweep were conducted to the degree necessary to allow the metal detector to get within a few inches of the ground surface. The magnetic detector is approximately 1 inch in diameter and is durable; therefore, it is possible to push the detector through brush and vegetation, and as a result, less brush cutting and vegetation removal was required. The all-metals detector has a detection head of approximately 8 inches and is more fragile than the magnetometer. Therefore, brush and vegetation were cleared to within a few inches of the ground surface.

The site is mostly wetlands and required vegetation cutting along the above mentioned geophysical survey transects. The transects were cleared of brush smaller than 2 inches in diameter, and other vegetation was cleared to a level no greater than 12 inches above the ground surface along 3-foot-wide

corridors on each transect to permit the passage of the survey equipment. Trees and brush 2 inches and larger were not cut. The survey crew worked around these obstacles.

8.13.4 UXO Detector-Aided Surface Survey

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix E.

Detector-aided surface sweeps of the established survey areas were conducted as shown on Figure 8-1. Sweeps, at 40-foot spaced transects along accessible portions of the site, were conducted. A 100 percent detector-aided surface sweep was also conducted of accessible areas within 50 feet of any anomaly clusters identified along transects during detector-aided surface sweeps, or during the subsurface geophysical investigation. The sweeps were conducted by UXO Technicians using hand held metal detectors (Schonstedt). The detector-aided surface sweeps were initially conducted using a magnetic locator (magnetic gradiometer) such as the Schonstedt GA-52Cx instrument or equivalent. During the surface sweep, if visual observations or other information showed that non-ferrous metals from suspect MEC were present, then an all-metals detector such as the White's Spectrum XLT or equivalent were used. The all- metals detector was either used in place of, or in conjunction with, the magnetic locator. The decision as to whether one or both detectors was used was based on the ability to place the sensor of the all-metals detector within 1 foot of the ground surface, the relative proportion of ferrous MEC items to non-ferrous MEC items, and the types of items visually observed and their relative potential to be MEC or MPPEH.

The UXO team worked with the site geophysicist to establish transects for both the detector-aided sweep and geophysical survey. Metal detectors were used to locate surface metal and debris. The transects were spaced 40 feet apart, and transect length was determined by accessibility (mainly related to wetlands and standing water). Rationale for terminating the transects was recorded in the field notes. The general UXO detector-aided survey was conducted as described in Section 3a.3. Locations where visual observations of suspect MEC, MPPEH, MD or subsurface anomalies were observed were marked with a stake. Pictures were taken of items observed on the surface. In clear areas, the locations were recorded using a GPS. In areas where tree canopy precluded use of a GPS, locations were established using a tape measure and compass measurements from a known location(s). All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and

procedures. The MEC hazard assessment methodology is described in Section 3a.5. MEC documentation is described in Section 3a.7.

8.13.5 Geophysical Surveying

A Geometrics G-858G magnetometer was used at the site because the expected targets at the site (e.g., projectiles) were expected to be predominantly ferrous metal objects, and the survey area was tidal marsh (which can limit the effectiveness of electromagnetic instruments). The geophysicist conducted the geophysical survey along accessible portions of 40-foot-spaced transects. GPS data were integrated at 1 second intervals to position the geophysical data. Small subsurface objects such as individual mortar or artillery rounds can generally only be detected at shallow burial depths. However, these items may be buried relatively deep in the marshy (soft) ground of the Stump Neck Impact Area, thereby possibly escaping detection by the geophysical survey. Targets of the geophysical investigation ranged from small to large object sizes at this site, and therefore survey depths varied as well.

Before the geophysical survey began, the UXO team conducted a visual and detector-aided surface sweep of the survey area. No suspect MEC were found during the surface sweep.

8.14 DEVIATIONS FROM WORK PLAN

Transect 1 on the west end of Stump Neck area could not be staked as it is in the Chicamuxen Creek and is not accessible. Transect 31 (east end) was inaccessible by foot.

8.15 MEC SURVEY RESULTS

The Field Forms are included in Appendix C. The UXO Surface Survey Activities are summarized from the daily and weekly logs at the Stump Neck Impact Area in the sections below.

8.15.1 UXO Detector-Aided Surface Survey Results

On December 15 and 16, transects 2 through 30 were swept with Schonstedts; no MEC or MD were located onsite, however an MD find near the site (Table ES-2) was discovered, as discussed below :

While traveling to the location of the Stump Neck Impact Area transects, and near the Stump Neck Impact Area boundary, the UXO team visually located a pile of unfuzed ceramic Japanese Type-3 mines (MD, no filler). Most were broken into pieces, but one was complete.

Figure 8-2 illustrates the Stump Neck Impact Area offsite MEC Finds Locations and Table 8-2 details the MEC/MPPEH find. Appendix D presents a photograph of the MD item discovered near the Stump Neck Impact Area boundary and is shown below.

8.15.2 Geophysical Survey Results

Figure 8-3 displays the interpretation of the site data. Anomalies auto-selected (picked) using the Blakely Test from the UX-Detect module of Geosoft are shown by "+" symbols with a number identifier, and are identified as buried ferrous metallic items. Items were selected based on an anomaly amplitude threshold of 5nT and higher, and 119 items are shown on Figure 8-3 with their corresponding georeferenced coordinates listed separately in Appendix E, Table 8-3. Although the items are scattered around the site, many tend to be located in clusters. The nature of the buried ferrous metallic items cannot be determined from the geophysical data alone; however, given the site's history of military training and the quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond.

8.16 MC SAMPLING PROGRAM

Information from the detector-aided surface sweep about the presence of MD and shallow subsurface anomalies was utilized to identify surface and subsurface MC soil sampling locations , and to determine if contamination exists. Tetra Tech consulted with the Navy and stakeholders to discuss results and

establish SI sampling locations for MC (in accordance with the separate UFP SAP). A total of 59 soil/sediment samples were collected at 15 locations at Stump Neck Impact Area. A total of 40 soil/sediment samples were proposed at 10 locations at Stump Neck Impact Area in the UFP SAP. Soil/sediment samples were collected at an additional five locations to cover the anomalies reported during the geophysical survey. Table 8-3 lists the sampling locations and the justification for selecting those locations.

If no suspect MEC, MPPEH, or subsurface anomaly clusters were observed, the samples were collected at the UFP SAP proposed locations. Figure 8-4 illustrates the sampling locations in conjunction with the MEC detector-aided surface sweep and geophysical survey findings at Stump Neck Impact Area. All soil/sediment samples were collected via hand auger because of the marshy conditions, and submitted to the fixed-base laboratory for explosives analysis. Three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis.

The CSM (detailed in Appendix B of Volume I of the UFP SAP) indicated that potentially complete exposure pathways existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist. The updated CSM is included in Section 8.22.

8.16.1 MC Sample Collection and Analysis

Soil sample locations were selected based on a bias towards areas that were believed to be most likely contaminated by past operations at the site. The total area of the site is 32.9 acres as indicated in Table ES-1. Figure 8-4 shows all sample locations. Prior to initiating sample collection, all sample locations were marked by colored pin flags bearing the sample location ID number. Collected sample locations identified in the approved UFP SAP were located by GPS and by measurements from stationary objects (e.g., roadways, existing buildings).

Surface and Subsurface Soil/Sediment

Although all samples were logged as sediment because of the saturated conditions of the marsh land, they were compared to soil criteria as outlined in the UFP SAP.

a) Thirty composite surface sediment/soil samples were collected from the 0- to 6-inch bgs and 0- to 24-inch bgs intervals at 15 sample locations. The 0- to 6-inch bgs interval is of interest for ecological risk screening while the 0- to 24-inch bgs interval is of interest for the human health risk screening.

Surface soil samples at each location sampled were composites of seven discrete samples collected using the seven-point wheel approach. Explosives present on the surface would have resulted from low order detonations releasing particles of explosives. These particles would be heterogeneously distributed in surface soil. In order to form a composite in which explosives would be evenly dispersed, the entire composite was processed in the laboratory using SW 846 Method 8330B, as described in Appendix A of the UFP SAP. This methodology consists of air drying and sieving the entire sample and conducting particle size reduction (grinding) of the entire sample.

b) Twenty-nine discrete subsurface sediment/soil samples were collected from 2 to 6 feet bgs at 15 surface soil sample locations. Two samples were collected within that depth interval at all but one of the locations (see section 8.17), based on visual observations of staining or other relevant indications (odors, discoloration, etc.). If these indications were not observed, samples were collected at 2 to 4 feet bgs and 4 to 5 feet or 4 to 6 feet bgs, depending on saturated conditions. All subsurface sediment/soil samples were analyzed for explosives (SW-846 Method 8330B).

c) Three sediment/soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

Anomaly avoidance techniques were followed for collection of all sediment/soil samples. Soil sample log sheets are included in Appendix F of this document.

8.17 WORK PLAN DEVIATIONS

Subsurface soil/sediment sample SB-0100406 was unable to be collected because of the saturated conditions. Soil/sediment samples were collected at an additional five locations to cover the anomalies reported during the geophysical survey.

8.18 SITE INSPECTION DATA COLLECTION RESULTS

8.18.1 MC Sampling Results

All soil samples collected were compared to the PALs and background sampling results, and a statistical evaluation was done to compare the background data with the site sampling results. The summary tables of the site background screening and PALs are presented in Appendix H and the MC analytical results are also presented in Appendix H. The data validation reports are presented in Appendix I. The statistical summary and calculations are presented in Appendix J. Tables 8-4 and 8-5 summarize the results as compared to the calculated screening values for explosives in surface soil and subsurface soil,

respectively. The PAL was the reference limit, unless the background and screening calculations exceeded this value. In Tables 8-4 and 8-5, if a parameter had an exceedance at any sampling point, the parameter is highlighted; individual sample exceedances are also highlighted.

8.19 DATA QUALITY REVIEW/USABILITY

8.19.1 Data Quality Review of Samples at Stump Neck Impact Area

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for the Stump Neck Impact Area were of acceptable quality for use in decision-making. The review began with data validation, which is a comparison of DQIs against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as "U," "J," "R," "L," "K," or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the DQOs of the project. The DQOs presented in the Munitions Response Program Site Inspections at Ten Munitions Response Program Ranges QAPP (September 2009) were maintained through the course of the sampling event. The Worksheets #19 and #15 of the QAPP present the analytical methods and compounds analyzed.

Table 5A in Appendix I presents all the qualified data and the reason for the data qualification. The laboratory control sample percent recovery for tetryl was less than 10 percent. The low LCS recovery resulted in the rejection of 12 out of 62 tetryl results. These 12 tetryl results are considered unusable. Table 5B in Appendix I presents all the qualified data and the reason for the data qualification. All data for samples collected at the Stump Neck Impact Area, except for 12 tetryl results, are considered valid for their intended purposes.

Soil saturation prevented the collection of sample X10SB0100406. The sample completeness was 98 percent. The laboratory analytical completeness was 100 percent.

The PQLGs are listed in Worksheet #15 in the QAPP (April 2009). Analytical sensitivity was generally satisfactory to meet DQOs presented in the QAPP. However, at the inception of the project, the laboratory could not meet the PQLGs for 2,4-dinitrotoluene, 2,4,6-trinitrotoluene, and RDX in sediment samples. Worksheet #15 highlights the exceedances of the PQLGs.

The amount of sample volume collected affects the ability of the laboratory to achieve the desired PQLGs. There are instances where the non-detected sample results exceeded the PQLGs because the laboratory did not use enough sample volume. The PALs) for 2,4-dinitrotoluene, 2,4,6-trinitrotoluene, and RDX were not met. The LQL exceeds the ecological screening criteria, but is below the human health screening criteria for COPC selection. For comparison to ecological screening criteria for COPC selection, one half the laboratory QL was be used.

Table 5A in Appendix I shows that twelve tetryl several results were rejected because of an LCS percent recovery less than 10 percent. There is a low tetryl bias for the tetryl results and the laboratory was not able to detect tetryl at the stated detection limit. The noncompliances listed in Table 5B in Appendix I do not show any directional bias with the data except for HMX, RDX, and tetryl. HMX had LCS recoveries less than the laboratory quality control limit but greater than 30 percent, indicating a slight low bias. RDX and tetryl had matrix spike recoveries less than the laboratory quality control limit but greater than 30 percent for one sample (X10SD0010024). This indicates a slight low bias for RDX and tetryl in sample X10SD0010024 only; all other matrix spikes had acceptable percent recoveries. Overall, the laboratory accuracy was acceptable, with the exceptions noted. There were no quality control deficiencies noted for field accuracy.

No data were qualified because of laboratory or field duplicate precision noncompliances.

No comparability issues were noted during the data validation process.

Based on field logs indicating the conditions during sample collection and laboratory audits, all reported data are adequately representative of site conditions and intended populations.

8.20 DATA COMPARISON TO PROJECT ACTION LIMITS

Thirty composite surface (0- to 6-inch and 0- to 24-inch bgs) soil/sediment samples and 29 discrete subsurface (2 to 4 feet and 4 to 5 or 6 feet bgs) soil/sediment samples were sent to the FBL for explosives analyses using SW 846 Method 8330B.

8.20.1 Surface Soil

Table 8-4 summarizes the results as compared to the calculated screening values for explosives in surface soil. There were 5 low level J detections of nitroglycerin in the composite surface soils. No other explosive constituents were detected.

8.20.2 Subsurface Soil

Table 8-5 summarizes the results as compared to the calculated screening values for explosives in subsurface soil. The nitroglycerin PAL was exceeded at one discrete subsurface soil sampling location, X10SD0030204 at a concentration of 0.91 J mg/kg, and was detected at one discrete subsurface soil sampling location, X10SD0090204 at a concentration of 0.19 J mg/kg. No other explosive constituents were detected. Figure 8-5 illustrates the location of X10SD0030204, which is at the northwestern portion of the site.

Three soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

Based on the statistical calculations, a human health risk screening evaluation was not performed. Explosives screening values were not exceeded at any surface sampling locations, which is the interval of interest for ecological risk screening. The statistical evaluation is discussed in Section 8.21.

8.20.3 CEC, pH, and TOC

One representative soil sample per sampling depth (0 to 2 feet, 2 to 4 feet, and 4 to 5 feet) was shipped to the FBL for CEC, pH, and TOC analyses. CEC was detected at 175 mEq/100 at X10SD0150024, 232 mEq/100 at X10SD0130204, and 109 mEq/100 at X10SD0130405. PH was detected at 6.53 S.U. at X10SD0150024, 6.4 S.U. at X10SD0130204, and 7.14 S.U. at X10SD0130405. TOC was detected at 137,000 mg/kg at X10SD0150024, 327,000 mg/kg at X10SD0130204 and 4820 mg/kg at X10SD0130405. There are no PALs for CEC or pH. The surface background TOC is 57,200 mg/kg and the subsurface background TOC is 66,500 mg/kg. TOC is a measure of the total amount of nonvolatile, volatile, partially volatile, and particulate organic compounds in a sample. These values were exceeded, most likely due to the high organic content found in swampy areas. The mobility of metals is influenced by pH and CEC. CEC is a calculated value that is an estimate of the ability of the soil to attract, retain, and exchange cations. Soils with CEC above 10 mEq have a higher clay content and a lower sand content with many positions to hold cations. In general, metal cations are most mobile under acidic conditions, and a pH of 7 is neutral. The pH level in this sample would be considered neutral. The mobility of metals generally increases with decreasing soil pH and CEC.

8.21 STATISTICAL EVALUATION

A 95 percent UCL is the upper bound of the associated confidence interval on the mean. Exposure assessment and cleanup decisions in support of U.S. EPA projects are often made based upon the mean concentrations of the contaminants of potential concern. A 95 percent *UCL* of the unknown population arithmetic mean is often used to estimate the EPC term (EPA 1992; EPA 2002). It is, therefore, important to compute a reliable, conservative, and stable 95 percent *UCL* of the population mean using the available data. There are several methods for calculating 95 percent UCLs depending on the data distribution that can be used to model the sample data and the amount of censoring that is present (percent of non-detected concentrations). For chemicals with maximum concentrations greater than the PAL or 95 percent background UTL, PRO UCL version 4.00.04 was used to calculate the appropriate UCL. Then the UCL was compared to the PAL. If the UCL was less than the PAL, it was determined that the chemical would not pose a risk. If the UCL was greater than the PAL, then it was determined that further evaluations should be conducted.

There were too few detected concentrations to calculate a UCL.

The purpose of the ecological risk screening evaluation is to conservatively estimate risks posed to potential human receptors from chemicals present at the Stump Neck Impact Area. Based on the results of the statistical evaluation, it was determined that no further action was required in regards to ecological exposures or human health screening.

8.22 UPDATED CSM

A three dimensional depiction of the Stump Neck Impact Area is shown as Figure 8-6. Only MC associated with the Stump Neck Impact Area are considered in the CSM exposure pathway analysis. This general description of the CSM exposure pathway analysis was included in Section 10.6.11 of the SAP: “The following CSM exposure pathways analysis focuses only on the Stump Neck Impact Area and does not consider impacts from the Valley firing fan. Historical evidence indicates that MEC may be present at the range. One pathway is runoff from precipitation. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil, soil, and sediment. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses. Only MC associated with the Stump Neck Impact Area are considered in the CSM exposure pathway analysis.

8.23 EXPOSURE PATHWAY ANALYSIS

As such, an Exposure Pathway Analysis for MEC was created and is shown on Figure 8-7A. No MD/MEC were discovered during the MEC surface survey, however 119 anomalies were logged during the subsurface geophysics survey. A potentially complete pathway exists for all human and ecological receptors for hand/tread underfoot contact at the Stump Neck Impact Area. Wetland areas are protected against intrusive activities such as digging, excavation, and construction; therefore, exposure pathways are incomplete for MEC for intrusive work in the surface and subsurface for human receptors. Ecological receptors may come in contact with MEC through burrowing, nesting, or feeding activities that disturb surface soil. Trespassers are anticipated to be exposed via nonintrusive surface soil activities at the range, but it is unlikely they would be exposed to subsurface soil through intrusive activities. Soil and surface water/sediment impacted by MC represents a primary potential source medium, as illustrated in the Exposure Pathway Analysis Figure for MC, Figure 8-7B. Exposures to surface soil, subsurface soil, and surface water/sediment containing MC present complete pathways for human and ecological receptors. All human and ecological receptors have complete exposure pathways for direct contact with MC in surface soil, which includes dermal contact, ingestion, and inhalation (dust). Recreational fishing occurs in this area. Therefore, human and ecological receptors have complete pathways by ingesting fish that have previously consumed contaminated vegetation or prey. Runoff, discharges, and/or erosion may transport MC from surface soil to surface water/sediment. The Stump Neck Impact Area is a wetland area, so complete pathways also exist for all human and ecological receptors of surface water/sediment. There is also the potential for the MC present in surface water and soil to infiltrate to the subsurface. Because construction or excavation is prohibited within the wetland areas, potentially complete exposure pathways exist for MC in subsurface soil for any human receptors. Although confining layers are expected to prevent the migration of MC to the lower aquifers used for water supplies, potentially complete pathways exist for MC in shallow groundwater for human receptors.

Figure 8-7A graphically presents an Exposure Pathway Analysis for MEC. The exposure sources appear to be limited.

The Exposure Pathway Analysis for MC (Figure 8-7B) illustrates several complete exposure pathways. Explosives were detected in soil during the MC SI investigation. Soil represents the primary source medium. All human and ecological receptors have complete exposure pathways for direct contact with MC in surface soil, which includes dermal contact, ingestion, and inhalation (dust). Plants may accumulate MC as well. MC entering the food chain may provide migration pathways for human and ecological receptors. The Stump Neck Impact Area is situated in a marshy area and is surrounded on three sides by Chicamuxen Creek. Surface water runoff may transport MC in surface soil to Chicamuxen

Creek. There were detections of nitroglycerin in surface and subsurface soil/sediment samples at Stump Neck Impact Area; therefore, there are completed pathways for MC.

8.24 CONCLUSIONS

- There is no additional information about this range's land use other than as an impact area and munitions testing area. According to the installation, there are no planned future activities at the range.

- Sources indicate that rockets may also have been fired at the impact area as late as 1947, and a variety of other training activities occurred including land surface demolition testing and underwater testing prior to the construction of the Area 8 pond in 1957.

- One hundred-nineteen anomaly items of amplitude threshold of 5nT and higher were identified during the geophysical survey. The items are scattered around the site, but many tend to be located in clusters. The nature of the buried ferrous metallic items cannot be determined from the geophysical data alone; however, given the site's history of military training and the quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond.

- There were no exceedances of explosives in the surface sediment/soils; therefore there were no MC of concern identified for ecological screening. However, there were low level detections of nitroglycerin.

- There was one exceedance of nitroglycerin in the subsurface soils; therefore the extent of potential environmental contamination at the site appears to be limited.

- The CSM and Exposure Pathway Analyses indicate that potentially complete exposure pathways exist for MEC and complete exposure pathways exist for MC for both human and ecological receptors under both current and hypothetical future land uses. Unacceptable levels of human and/or ecological risk may exist. However, groundwater is not currently used at the site.

8.24.1 Data Gaps

There were no data gaps.

8.25 RECOMMENDATIONS FOR NEXT PHASE

Low level explosives were detected in surface and subsurface soil. The presence of 119 subsurface anomalies indicates the possibility that munitions-related material may be present at Stump neck Impact Area (UXO-10). Clusters were identified randomly throughout the site. The nature of these buried metallic items cannot be determined from the geophysical data, and can only be characterized through intrusive investigation. Based on these results, a more extensive evaluation, in the form of an RI, is recommended for UXO-10. The scope of effort for the RI, which will include further characterization, delineation, and intrusive investigations, will be determined during project planning.

MEC

Proceed to an RI. The RI should include:

- Clearance of surface MEC/MPPEH and non-munition debris.
- Subsurface geophysical investigation.
- Investigation of representative subset of subsurface anomaly discovered during the geophysical investigation.

MC

- No further action is recommended, however MC sampling if subsurface MEC/MPPEH are found.

TABLE 8-1

MUNITION TYPES AND CHEMICALS
STUMP NECK IMPACT AREA - UXO 10
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MUNITIONS TYPES USED/STORED AT THE FACILITY	ASSOCIATED CHEMICAL CONSTITUENTS
TNT	2,4,6-trinitrotoluene
HMX	Octogen: a powerful and relatively insensitive nitroamine high explosive, chemically related to RDX
Composition B	59/40/1/ mixture of RDX, TNT and beeswax
Composition D	TNT and RDX
Perchlorate	Perchlorates are the salts derived from perchloric acid ($HClO_4$).
black powder	Blackpowder (potassium nitrate, sulphur, charcoal or coal, nitrocellulose)
wet gun cotton	nitrocellulose
randite	calcite and beta-uranotile with some tvuvamunite.
smokeless powder	Propellants (ex. Nitrocellulose), Deterrents (ex. Dibutyl phthalate), Stabilizers (ex. Calcium carbonate), Flash reducers (ex. potassium sulfate), Additives (ex. Wax)
brown prismatic powder	prismatic grain shape substittute for black powder
emmensite	potassium picrate
joveite	potassium picrate
37-mm or Naval one-pounder	Inorganic compounds - potassium, magnesium, strontium compounds. Nitro compounds - Explosive D.
75-mm pack howitzers	Inorganic compounds - Lead azide, ammonium nitrate. Nitroamines - RDX, Tetryl. Amines - Diphenylamine. Nitrocompounds - TNT and degradation products.
155-mm guns	Inorganic compounds - Lead azide, ammonium nitrate. Nitroamines - RDX, Tetryl. Amines - Diphenylamine. Nitrocompounds - TNT and degradation products.

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 8-2

STUMP NECK IMPACT AREA
MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

FACILITY	Stump Neck Annex of Indian Head MD
SITE NUMBER & NAME	112G00810 MMRP Site Investigation

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition			Notifications Completed (indicate w/ √ as applicable)	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
12/15/2010	1500	Near Stump Neck Impact Area boundary	Type-3 mine			X	322739.94	1249068.01	Type-3 Mine, Japanese	Ceramic, unfuzed, dumped, most are broken, one is complete. Located while in transit from staging area to Stump Neck Impact Area transects			12/15/2010	X	Type-3 mine

TABLE 8-3

MC SAMPLING PROGRAM
STUMP NECK IMPACT AREA - UXO 10
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Sampling Locations	Justification
X10SB001	Geophysical Anomolies
X10SB002	Geophysical Anomolies
X10SB003	Geophysical Anomolies
X10SB004	Geophysical Anomolies
X10SB005	Geophysical Anomolies
X10SB006	Geophysical Anomolies
X10SB007	Geophysical Anomolies
X10SB008	Geophysical Anomolies
X10SB009	Geophysical Anomolies
X10SB010	Geophysical Anomolies
X10SB011	Geophysical Anomolies
X10SB011	Geophysical Anomolies
X10SB012	Geophysical Anomolies
X10SB013	Geophysical Anomolies
X10SB014	Geophysical Anomolies
X10SB015	Geophysical Anomolies

TABLE 8-4

SURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			a01		a03		a09		a11		a21		a23		a29		a31		a37		a39	
	z			001		003		009		011		021		023		029		031		037		039	
	nsample			X10SD0010006		X10SD0010024		X10SD0020006		X10SD0020024		X10SD0030006		X10SD0030024		X10SD0040006		X10SD0040024		X10SD0050006		X10SD0050024	
	location			X10SD001		X10SD001		X10SD002		X10SD002		X10SD003		X10SD003		X10SD004		X10SD004		X10SD005		X10SD005	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X10SD0010006		X10SD0010024		X10SD0020006		X10SD0020024		X10SD0030006		X10SD0030024		X10SD0040006		X10SD0040024		X10SD0050006		X10SD0050024	
	sample_dat			20100126		20100126		20100125		20100125		20100125		20100125		20100126		20100126		20100126		20100126	
	matrix			SD		SD		SD		SD		SD		SD		SD		SD		SD		SD	
	duplicate																						
	top_depth			0		0		0		0		0		0		0		0		0		0	
	bottom_dep			0.5		2		0.5		2		0.5		2		0.5		2		0.5		2	
cas	x	utl95val	minorpal	c_001		c_003		c_009		c_011		c_021		c_023		c_029		c_031		c_037		c_039	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.24	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	UJ	1.2	U	0.34	J	1.2	U	1.2	U	1.2	U	0.32	J	1.2	UJ
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.19	U	0.2	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.19	U	0.2	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC																				
TTNUS288	PERCENT MOISTURE (%)	NA	NC																				
TTNUS291	PERCENT SOLIDS (%)	NA	NC																				
TTNUS002	PH (S.U.)	8.8	NC																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NC																				

TABLE 8-4

SURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			a45		a47		a53		a55		a61		a63		a69		a71		a72		a74		a81	
	z			045		047		053		055		061		063		069		071		072		074		081	
	nsample			X10SD0060006		X10SD0060024		X10SD0070006		X10SD0070024		X10SD0080006		X10SD0080024		X10SD0090006		X10SD0090024		X10SD0090024-AVG		X10SD0090024-D		X10SD0100006	
	location			X10SD006		X10SD006		X10SD007		X10SD007		X10SD008		X10SD008		X10SD009		X10SD009		X10SD009		X10SD009		X10SD010	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X10SD0060006		X10SD0060024		X10SD0070006		X10SD0070024		X10SD0080006		X10SD0080024		X10SD0090006		X10SD0090024		X10SD0090024-AVG		FD020210-02		X10SD0100006	
	sample_dat			20100126		20100126		20100126		20100126		20100202		20100202		20100202		20100202		20100202		20100202		20100125	
	matrix			SD		SD		SD		SD		SD		SD		SD		SD		SD		SD		SD	
	duplicate																					X10SD0090024			
	top_depth			0		0		0		0		0		0		0		0		0		0		0	
	bottom_dep			0.5		2		0.5		2		0.5		2		0.5		2		2		2		0.5	
cas	x	utl95val	minorpal	c_045		c_047		c_053		c_055		c_061		c_063		c_069		c_071		c_072		c_074		c_081	
	Explosives (mg/kg)																								
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.25	U	0.25	UJ	0.25	UJ	0.25	U	0.25	U	0.25	UJ	0.25	UJ	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	UJ	0.2	UJ	0.20	UJ	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.19	U	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	0.087	J	1.2	UJ	0.3	J	1.2	UJ	1.2	U	1.2	U	1.2	UJ	1.2	UJ	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ	1.2	U	1.2	U	1.2	UJ	1.2	UJ	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
	Miscellaneous Parameters																								
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC																						
TTNUS288	PERCENT MOISTURE (%)	NA	NC																						
TTNUS291	PERCENT SOLIDS (%)	NA	NC																						
TTNUS002	PH (S.U.)	8.8	NC																						
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NC																						

TABLE 8-4

SURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			a83		a87		a89		a95		a97		a031		a051		a111		a131		a191		a211	
	z			083		087		089		095		097		103		105		111		113		119		121	
	nsample			X10SD0100024		X10SD0110006		X10SD0110024		X10SD0120006		X10SD0120024		X10SD0130006		X10SD0130024		X10SD0140006		X10SD0140024		X10SD0150006		X10SD0150024	
	location			X10SD010		X10SD011		X10SD011		X10SD012		X10SD012		X10SD013		X10SD013		X10SD014		X10SD014		X10SD015		X10SD015	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X10SD0100024		X10SD0110006		X10SD0110024		X10SD0120006		X10SD0120024		X10SD0130006		X10SD0130024		X10SD0140006		X10SD0140024		X10SD0150006		X10SD0150024	
	sample_dat			20100125		20100127		20100127		20100127		20100127		20100202		20100202		20100127		20100127		20100202		20100202	
	matrix			SD		SD		SD		SD		SD		SD		SD		SD		SD		SD		SD	
	duplicate																								
	top_depth			0		0		0		0		0		0		0		0		0		0		0	
	bottom_dep			2		0.5		2		0.5		2		0.5		2		0.5		2		0.5		2	
cas	x	utl95val	minorpal	c_083		c_087		c_089		c_095		c_097		c_103		c_105		c_111		c_113		c_119		c_121	
	Explosives (mg/kg)																								
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	UJ
99-08-1	P	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	0.53	J	1.2	U	1.2	UJ	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	UR	0.2	UR	0.2	UR	0.2	UR	0.2	U	0.2	U	0.2	UR	0.2	UR	0.2	U	0.2	U
	Miscellaneous Parameters																								
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC																					175	
TTNUS288	PERCENT MOISTURE (%)	NA	NC																					83.4	
TTNUS291	PERCENT SOLIDS (%)	NA	NC																					16.6	
TTNUS002	PH (S.U.)	8.8	NC																					6.53	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NC																					137000 [BKG]	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			a05		a07		a13		a15		a16		a18		a25		a27		a33	
	z			005		007		013		015		016		018		025		027		033	
	nsample			X10SD0010204		X10SD0010405		X10SD0020204		X10SD0020405		X10SD0020405-AVG		X10SD0020405-D		X10SD0030204		X10SD0030405		X10SD0040204	
	location			X10SD001		X10SD001		X10SD002		X10SD002		X10SD002		X10SD002		X10SD003		X10SD003		X10SD004	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X10SD0010204		X10SD0010405		X10SD0020204		X10SD0020405		X10SD0020405-AVG		FD012610-01		X10SD0030204		X10SD0030405		X10SD0040204	
	sample_dat			20100126		20100126		20100126		20100126		20100126		20100126		20100126		20100126		20100126	
	matrix			SD		SD		SD		SD		SD		SD		SD		SD		SD	
	duplicate													X10SD0020405							
	top_depth			2		4		2		4		4		4		2		4		2	
	bottom_dep			4		5		4		5		5		5		4		5		4	
cas	x	utl95val	minorpal	c_005		c_007		c_013		c_015		c_016		c_018		c_025		c_027		c_033	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	**NA**	9	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
99-65-0	1,3-DINITROBENZENE	**0.75**	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.25	U	0.25	U	0.245	U	0.24	U	0.45	U	0.23	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.245	U	0.24	U	0.45	U	0.23	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
55-63-0	**NITROGLYCERIN**	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ	**0.91 [PAL] [ORNL]**	J	1.1	UJ	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	2.2	U	1.1	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U	0.36	U	0.18	U	0.2	U
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC																		
TTNUS288	PERCENT MOISTURE (%)	NA	NC																		
TTNUS291	PERCENT SOLIDS (%)	NA	NC																		
TTNUS002	PH (S.U.)	8.8	NC																		
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC																		

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			a35		a41		a43		a49		a51		a57		a59		a65		a67		a77
	z			035		041		043		049		051		057		059		065		067		077
	nsample			X10SD0040405		X10SD0050204		X10SD0050405		X10SD0060204		X10SD0060405		X10SD0070204		X10SD0070405		X10SD0080204		X10SD0080405		X10SD009
	location			X10SD004		X10SD005		X10SD005		X10SD006		X10SD006		X10SD007		X10SD007		X10SD008		X10SD008		X10SD009
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_201
	sample_coc			X10SD0040405		X10SD0050204		X10SD0050405		X10SD0060204		X10SD0060405		X10SD0070204		X10SD0070405		X10SD0080204		X10SD0080405		X10SD009
	sample_dat			20100126		20100126		20100126		20100126		20100126		20100126		20100126		20100202		20100202		20100202
	matrix			SD		SD		SD		SD		SD		SD		SD		SD		SD		SD
	duplicate																					
	top_depth			4		2		4		2		4		2		4		2		4		
	bottom_dep			5		4		5		4		5		4		5		4		5		
cas	x	utl95val	minorpal	c_035		c_041		c_043		c_049		c_051		c_057		c_059		c_065		c_067		c_077
	Explosives (mg/kg)																					
99-35-4	1,3,5-TRINITROBENZENE	**NA**	9	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	**0.75**	0.61	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.24	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	NA	2.9	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	UJ	0.2	UJ	0.2
99-99-0	4-NITROTOLUENE	NA	30	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
55-63-0	**NITROGLYCERIN**	NA	0.61	1.1	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ	1.2	UJ	1.2	UJ	1.2	U	1.2	U	0.19
78-11-5	PETN	NA	NA	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
	Miscellaneous Parameters																					
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC																			
TTNUS288	PERCENT MOISTURE (%)	NA	NC																			
TTNUS291	PERCENT SOLIDS (%)	NA	NC																			
TTNUS002	PH (S.U.)	8.8	NC																			
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC																			

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

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J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter				a79		a85		a91		a93		a99		a011		a071		a091		a151
	z				079		085		091		093		099		101		107		109		115
	nsample			0204	X10SD0090405		X10SD0100204		X10SD0110204		X10SD0110405		X10SD0120204		X10SD0120405		X10SD0130204		X10SD0130405		X10SD014
	location				X10SD009		X10SD010		X10SD011		X10SD011		X10SD012		X10SD012		X10SD013		X10SD013		X10SD014
	project_no			0042	00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_201
	sample_coc			0204	X10SD0090405		X10SD0100204		X10SD0110204		X10SD0110405		X10SD0120204		X10SD0120405		X10SD0130204		X10SD0130405		X10SD014
	sample_dat				20100202		20100125		20100127		20100127		20100127		20100127		20100202		20100202		20100127
	matrix				SD		SD		SD		SD		SD		SD		SD		SD		SD
	duplicate																				
	top_depth			2		4		2		2		4		2		4		2		4	
	bottom_dep			4		5		4		4		5		4		5		4		5	
cas	x	utl95val	minorpal		c_079		c_085		c_091		c_093		c_099		c_101		c_107		c_109		c_115
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	**NA**	9	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	**0.75**	0.61	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	NA	2.9	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	UJ	0.2	UJ	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UJ	0.2
99-99-0	4-NITROTOLUENE	NA	30	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	UL	0.2	UL	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2
98-95-3	NITROBENZENE	NA	0.023	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
55-63-0	**NITROGLYCERIN**	NA	0.61	J	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	U	1.2
78-11-5	PETN	NA	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	U	1.2
121-82-4	RDX	NA	5.5	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	U	0.2	U	0.2	U	0.2	UR	0.2	UR	0.2	UR	0.2	UR	0.2	U	0.2	U	0.2
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC														232		109		
TTNUS288	PERCENT MOISTURE (%)	NA	NC														86.2		26.5		
TTNUS291	PERCENT SOLIDS (%)	NA	NC														13.8		73.5		
TTNUS002	PH (S.U.)	8.8	NC														6.4		7.14		
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC														**327000 [BKG]**		4820		

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter				a171		a231		a241		a261		a291	
	z				117		123		124		126		129	
	nsample			0204	X10SD0140405		X10SD0150204		X10SD0150204-AVG		X10SD0150204-D		X10SD0150406	
	location				X10SD014		X10SD015		X10SD015		X10SD015		X10SD015	
	project_no			0042	00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			0204	X10SD0140405		X10SD0150204		X10SD0150204-AVG		FD020210-01		X10SD0150406	
	sample_dat				20100127		20100202		20100202		20100202		20100202	
	matrix				SD		SD		SD		SD		SD	
	duplicate										X10SD0150204			
	top_depth			2	4		2		2		2		4	
	bottom_dep			4	5		4		4		4		6	
cas	x	utl95val	minorpal		c_117		c_123		c_124		c_126		c_129	
	Explosives (mg/kg)													
99-35-4	1,3,5-TRINITROBENZENE	**NA**	9	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	**0.75**	0.61	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	UJ	0.20	UJ	0.2	UJ	0.2	UJ
99-99-0	4-NITROTOLUENE	NA	30	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
55-63-0	**NITROGLYCERIN**	NA	0.61	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	UR	0.2	UR	0.2	U	0.20	U	0.2	U	0.2	U
	Miscellaneous Parameters													
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC											
TTNUS002	PH (S.U.)	8.8	NC											
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD\SN_IMPACT_AREA_MEC.MXD 4/16/10 KM

1249000 1250000 1251000

322000

N

UXO Detector-Aided Sweep and Geophysical Transects (40-foot line spacing shown)

Chicamuxen Creek

Roach Road

25MW01

25MW02

200 100 0 200 Feet

Legend

- Monitoring Well
- MRP Area Boundary Identified During PA
- Installation Boundary
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	8/24/07
CHECKED BY	DATE
E. BERKLITE	4/16/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

STUMP NECK IMPACT AREA (UXO-10)
MEC INVESTIGATION LOCATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	
N62467-04-D-0055	
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 8-1	0

1249000 1250000 1251000

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1249000 1250000 1251000

322000

N

Roach Road

Chicamuxen Creek

Legend

- Munitions Debris
- MPPEH
- MRP Area Boundary Identified During PA
- Installation Boundary
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

Vertical Magnetic Gradient
(nanoteslas per two feet)

29 28 28 27 26 25 25 24 23 22 22 21 20 19 18 18 17 16 15 15 14 13 12 12 11 10 9 8 8 7 6 5 5 4 3 2 2 1

200 100 0 200
Feet

DRAWN BY	DATE
K. MOORE	1/14/10
CHECKED BY	DATE
E. BERKLITE	4/16/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

STUMP NECK IMPACT AREA (UXO-10)
MEC FINDS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	
N62467-04-D-0055	
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 8-2	0

1249000 1250000 1251000

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1249000

1250000

322000

N

NOTE: Geometrics G-858G data shown.

Legend

- Buried Ferrous Metallic Items (with unique identifier)
  119 Anomalies Identified
- MRP Area Boundary Identified During PA
- Installation Boundary
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

Vertical Magnetic Gradient
(nanoteslas per two feet)

29 28 28 27 26 25 25 24 23 22 22 21 20 19 18 18 17 16 15 15 14 13 12 12 11 10 9 8 8 7 6 5 5 4 3 2 2 1

100 50 0 100
Feet

DRAWN BY	DATE
K. MOORE	1/14/10
CHECKED BY	DATE
E. BERKLITE	7/12/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

STUMP NECK IMPACT AREA (UXO-10)
GEOPHYSICAL ANOMALIES LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 8-3	0

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD\SN_IMPACT_AREA_SAMPLING.MXD 7/9/10 KM

1249000 1250000 1251000

322000

X10SD001 X10SD002 X10SD003 X10SD004 X10SD005 X10SD006 X10SD007 X10SD008 X10SD009 X10SD010 X10SD011 X10SD012 X10SD013 X10SD014 X10SD015

Roach Road

Chamuxen Creek

N

29 28 28 27 26 25 25 24 23 22 22 21 20 19 18 18 17 16 15 15 14 13 12 12 11 10 9 8 8 7 6 5 5 4 3 2 2 1

Vertical Magnetic Gradient
(nanoteslas per two feet)

200 100 0 200
Feet

Legend

- Sediment Sample Location
- Munitions Debris
- MPPEH
- Buried Ferrous Metallic Items (with unique identifier)
  119 Anomalies Identified
- MRP Area Boundary Identified During PA
- Installation Boundary
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	1/14/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

STUMP NECK IMPACT AREA (UXO-10)
SAMPLE LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 8-4	0

1249000 1250000 1251000

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1249000 1250000 1251000

322000

X10SD001 NO EXC
X10SD002 NO EXC
X10SD003 Depth = 2 - 4' Explosives (mg/kg) NITROGLYCERIN 0.91 J [PAL] [ORNL] X10SD003 NO EXC
X10SD004 NO EXC
X10SD005 NO EXC
X10SD006 NO EXC
X10SD007 NO EXC
X10SD008 NO EXC
X10SD009 NO EXC
X10SD010 NO EXC
X10SD011 NO EXC
X10SD012 NO EXC
X10SD013 NO EXC
X10SD014 NO EXC
X10SD015 NO EXC

Chicamuxen Creek

Roach Road

25MW02

N

200 100 0 200 Feet

Legend

- Soil Boring Location
- MRP Area Boundary Identified During PA
- Installation Boundary
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	5/28/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

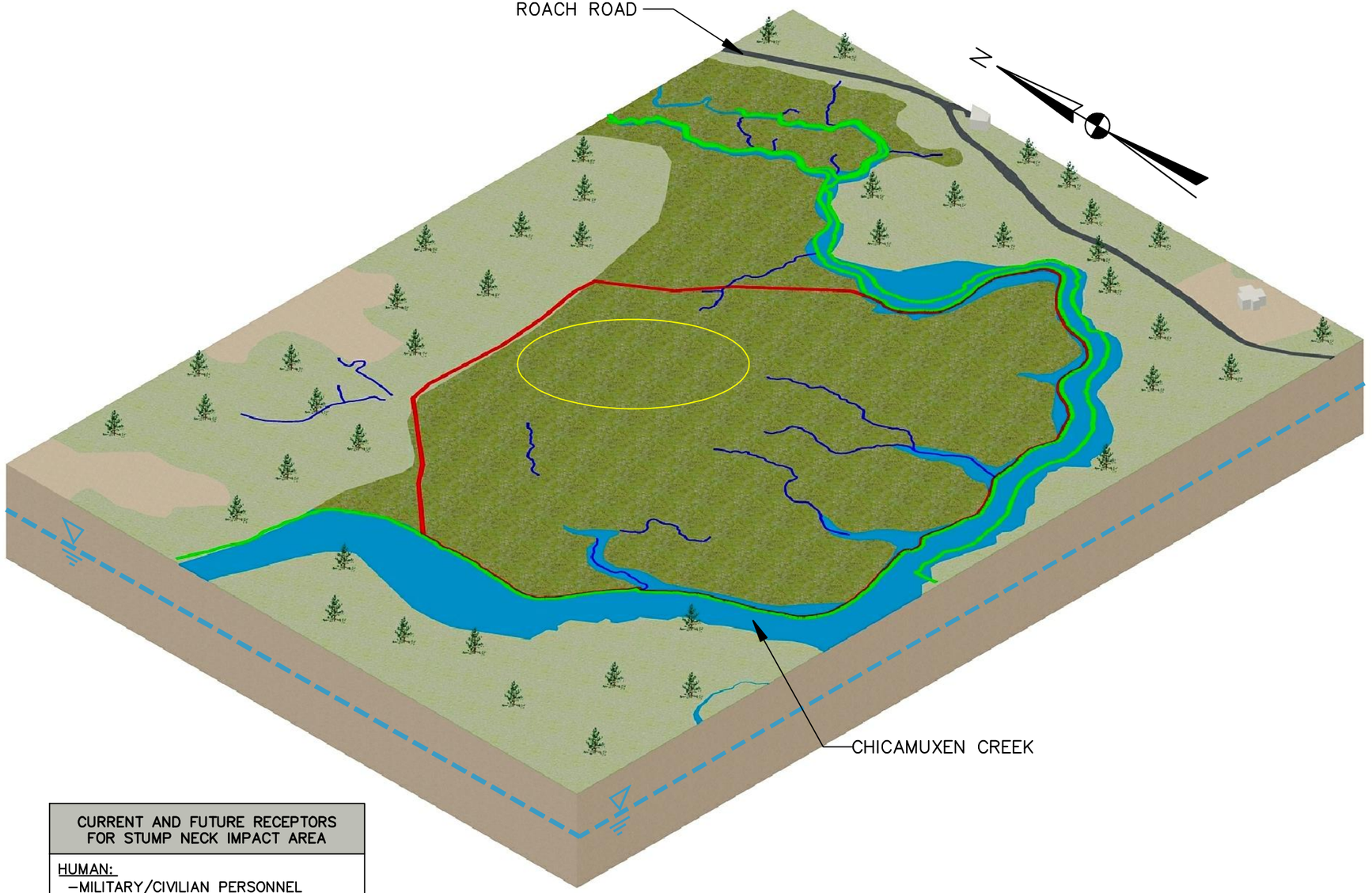
NAVFAC

STUMP NECK IMPACT AREA (UXO-10)
SUBSURFACE SOIL EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 8-5	0

LEGEND

- MRP AREA BOUNDARY IDENTIFIED DURING PA
- INSTALLATION BOUNDARY
- SURFACE DRAINAGE
- STUMP NECK IMPACT AREA
- WATER TABLE (ESTIMATED)
- BUILDINGS
- TREE
- GRASS
- PAVED ROAD
- FOREST
- WETLANDS
- WATER



NITROGLYCERIN CONCENTRATIONS OBSERVED IN SOIL SAMPLES FROM STUMP NECK IMPACT AREA	
SAMPLE I.D.	NITROGLYCERIN CONCENTRATION
X10SD0030204	*0.91J mg/kg
X10SD0030006	0.34J mg/kg
X10SD0050006	0.32J mg/kg
X10SD0070006	0.087J mg/kg
X10SD0080006	0.30J mg/kg
X10SD0120006	0.55J mg/kg
* EXCEEDANCE OF PAL–0.61 mg/kg	

CURRENT AND FUTURE RECEPTORS FOR STUMP NECK IMPACT AREA
HUMAN: –MILITARY/CIVILIAN PERSONNEL –CONTRACTORS –TRESPASSERS
ECOLOGICAL: –PLANTS –INVERTEBRATES –BIRDS –MAMMALS

DRAWN BY ND	DATE 6–10–10	STUMP NECK IMPACT AREA UXO–10 CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND
CHECKED BY	DATE	
REVISED BY	DATE	
SCALE NOT TO SCALE		

NAVFAC

CONTRACT NO. 0810	
OWNER NO.	
APPROVED BY	DATE
DRAWING NO. FIGURE 8–6	REV. 0

R: \0810\CSM\0810CSM007.dwg PIT NICHOLE.DILLA 7/14/2010 9:14:07 AM

FIGURE 8-7A

MEC EXPOSURE PATHWAY ANALYSIS

STUMP NECK IMPACT AREA

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

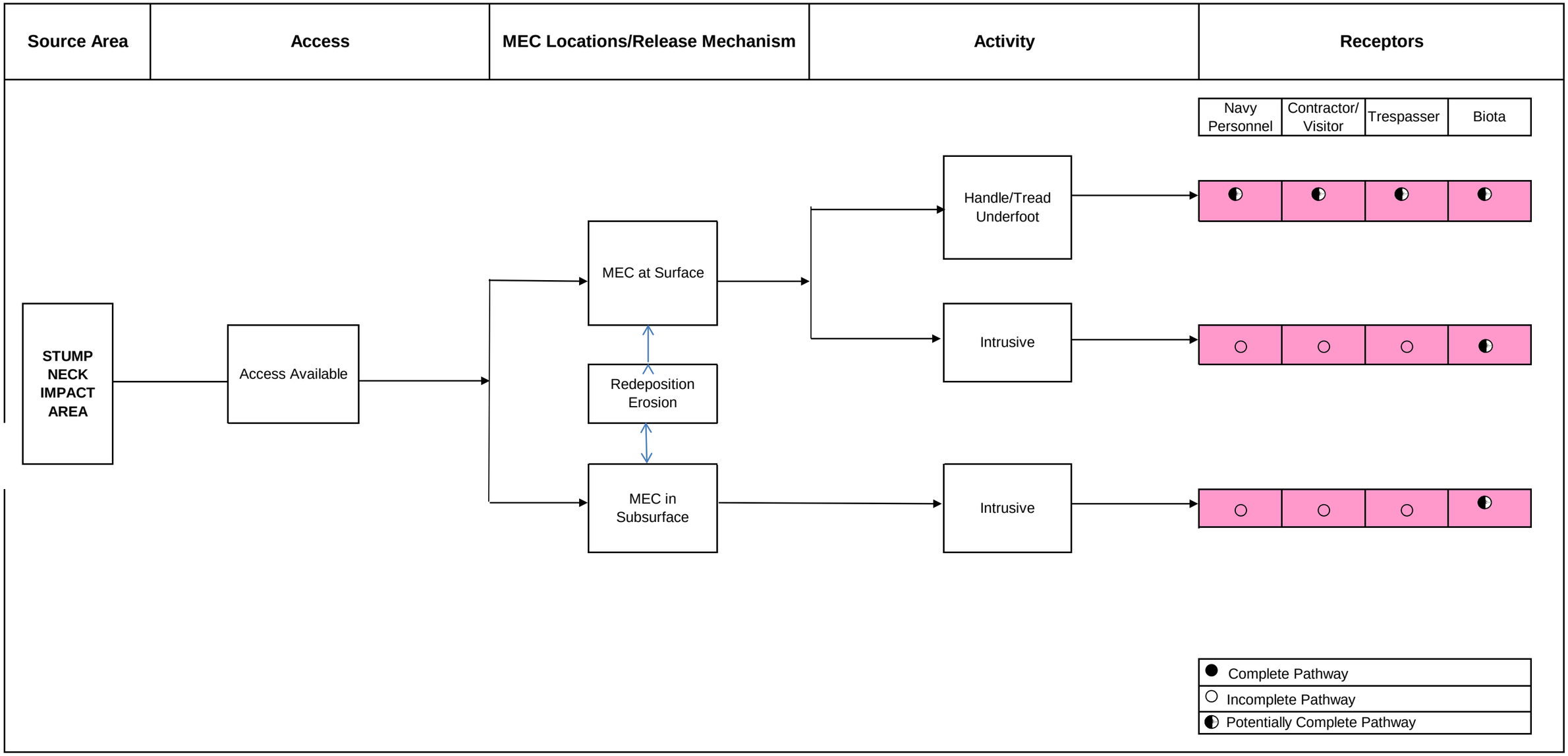
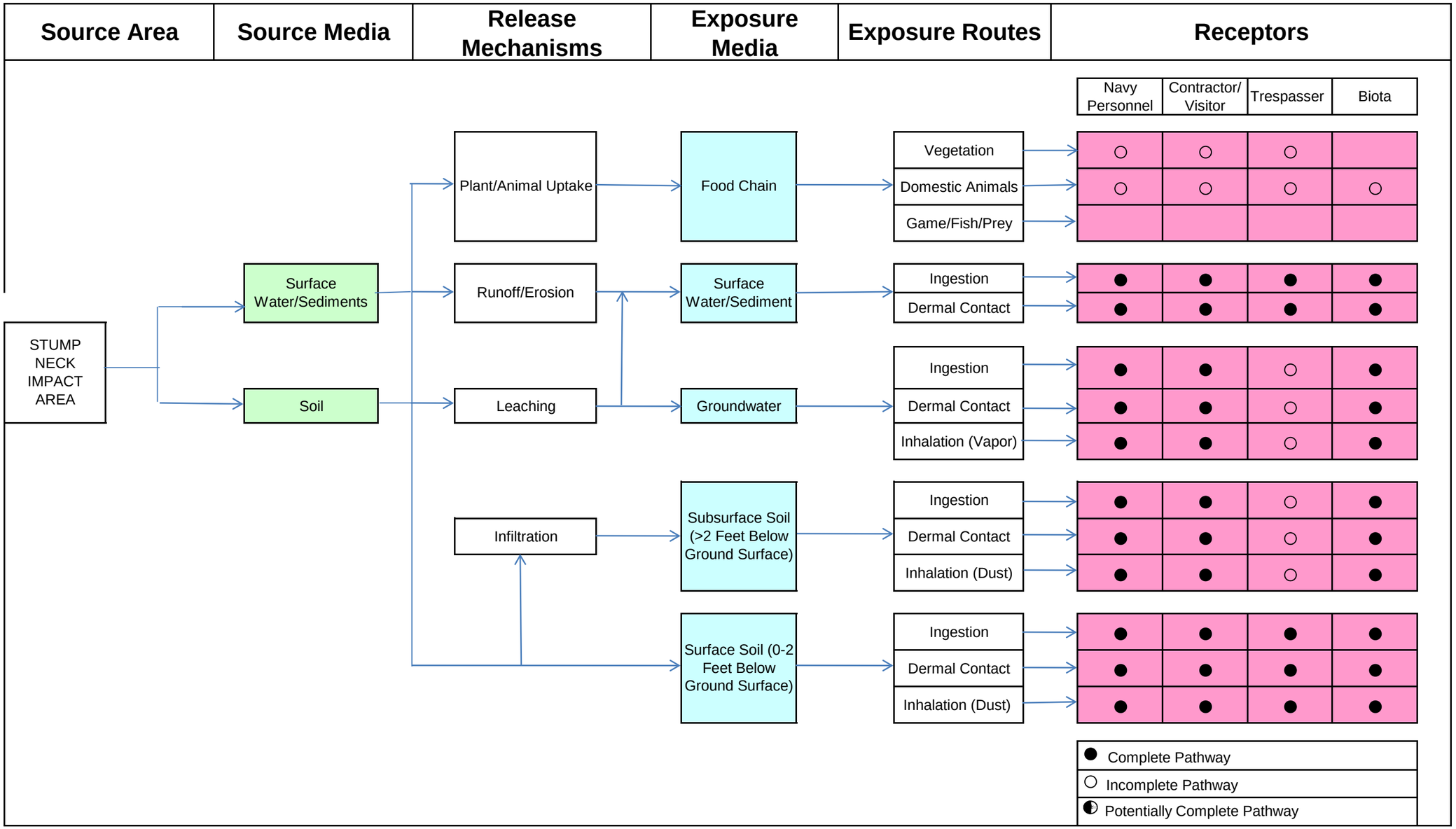


FIGURE 8-7B

MC EXPOSURE PATHWAY ANALYSIS

STUMP NECK IMPACT AREA UXO 10

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



9.0 TORPEDO BURIAL AREA – UXO-12

9.1 LOCATION AND SETTING

The Torpedo Burial Site is a 0.9-acre site located in a wooded area in the eastern portion of Stump Neck Annex, about 330 feet south of Building 2075. The site is semicircular in shape with the main axis oriented east-west. The original site boundary, as identified in the Navy's Range Inventory, was expanded after a 21-inch torpedo casing was observed during the 2003 visual survey. Additional features include a marsh wetland immediately south, and a seasonal tributary that bisects the site. The site is accessed via a southbound dirt road off Archer Avenue, then by proceeding easterly on foot along a utility right of way through the woods. The ground is wet with many small pools of standing water and is thinly covered with grass, shrubs, and trees.

9.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

Building 2075 is within approximately 330 feet of the Torpedo Burial Site and is the only building nearby. The building is now condemned. There is no evidence of any pre-existing structure at the site. This site is undeveloped, and there is no evidence of utilities on the Torpedo Burial Site. The aforementioned building is no longer in use; however, it is assumed that water and electricity were previously available. There is no additional information about this area's land use prior to and since the late 1940s and early 1950s when it was used for torpedo burial. According to installation personnel, there are no planned future activities at the site**.**

9.3 TOPOGRAPHY

The land surface at the Torpedo Burial Site gently slopes toward Chicamuxen Creek to the south. Elevations across the site range from approximately 1 to 5 feet above msl. Because of the topography of the area and the vegetative ground cover, severe erosion is not considered to be a problem.

9.4 GEOLOGY

Site-specific geology was classified for the Torpedo Burial Site during this SI's shallow surface boring investigation. Soil for the 0 to 4 feet bgs interval were characterized as a sandy clay, the 4 to approximately 6 feet bgs interval was characterized as a clayey sand, and at some locations either a hard clay or a gravelly sand was encountered at approximately 6 feet bgs. As described in Section 2.2.3 - Regional Hydrogeology, in most of the study area, the surficial sediments consist of Pleistocene

paleochannel deposits and Holocene alluvial and paludal deposits (Hiortdahl, 1997). These deposits consist of gravel, sand, silt, clay, and peat mixtures with irregular bedding and with an aggregate thickness of 0 to approximately 40 feet. Groundwater was generally encountered in the borings at approximately 5 to 6 feet bgs. No waste material was encountered during the shallow surface investigation. Soil and sediment log sheets are included in Appendix F.7. Boring logs are included in Appendix F.1.

9.5 SOIL AND VEGETATION

According to the Soil Survey of Charles County, soil at the Torpedo Burial Site is identified as Mattapex silt loam with 0 to 2 percent slopes (USDA, 1974). Logs from soil borings and test pits installed at the Tool Burial Site (IR Site #34), less than 100 feet west of the Torpedo Burial Site, indicate shallow geologic conditions consisting primarily of sand and gravelly sand overlying clay and silt. The gravels are composed of quartz and are well rounded to subrounded. The vegetation at the Torpedo Burial Site is characterized by heavy grass, shrubs, and trees approximately 10 to 30 feet tall. The wetland area south of the site is classified by the installation as a Palustrine emergent/broadleaved deciduous scrub-shrub wetland.

9.6 HYDROLOGY

The small tributary that bisects the Torpedo Burial Site is a surface runoff sink that overflows into the marsh directly south of the site during heavy rainfalls (Figure 9-1). Chicamuxen Creek, which borders the marsh on three sides, is also an important hydrologic feature because it may be another collection point for surface water runoff from the site. The wetlands and tributaries eventually drain into the Potomac River.

9.7 HYDROGEOLOGY

Data from the adjacent IR Site #34 indicate a shallow unconfined aquifer at approximately 2 to 5 feet bgs. Based on the topography, groundwater flow is expected to the northwest, away from Chicamuxen Creek, possibly along a sand lense.

9.8 WETLANDS

The small tributary that bisects the Torpedo Burial Site is a surface runoff sink that overflows into the marsh directly south of the site during heavy rainfalls. Chicamuxen Creek, which borders the marsh on three sides, is also an important hydrologic feature because it may be another collection point for surface

water runoff from the site. The wetlands and tributaries eventually drain into the Potomac River. The Torpedo Burial Site is a low-lying area bordered by wetlands on the southern edge. Surface runoff occurs either easterly into Chicamuxen Creek, southerly into the wetlands, or into the seasonal tributary that bisects the site. Runoff in the direction of Mattawoman Creek is unlikely to cross Archer Avenue.

TBS-2. Small Tributary that Bisects the Torpedo Burial Site (Looking South Towards the Wetlands)

9.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

According to the 1996 Phase I Cultural Resources Survey of Stump Neck Annex, there are no archeological/cultural sites within the Torpedo Burial Site. Several shovel test pits were excavated on the site, and all were negative for artifacts.

9.10 HISTORICAL INFORMATION

The Torpedo Burial Site consists of a semi-circular shaped parcel, measuring approximately 1 acre in area, in the eastern portion of Stump Neck Annex facility, although it is uncertain whether 15-foot long torpedoes were actually buried at this location. According to available reports, the site consists of at least one unlined earthen pit used to bury waste material including torpedoes, primers, detonators, fuzes, squibs, and other associated hardware transported from a torpedo station near Washington, D.C., in the

late 1940s or early 1950s. The site area was expanded following the discovery of a 21-inch torpedo casing during the visual survey.

The entire Torpedo Burial Site is considered a suspected MEC area, although the 21-inch torpedo casing discovered during the visual survey is the only known MEC area.

9.11 MUNITIONS USED

This section describes the munitions and munitions-related materials known or suspected to be at the site. This includes both MEC and non-hazardous munitions-related debris (e.g., fragmentation, base plates, inert mortar fins). The Torpedo Burial Site was believed to be used to dispose of torpedoes and related accessories. With the exception of the items previously discussed, no other MEC or munitions-related debris are known to be at the Torpedo Burial Site. The Torpedo Burial Site is overlapped by the firing fan from the Valley Impact Area located at the Main Installation. Thus, there is a potential for munitions associated with the Valley to be present at the Torpedo Burial Site. Information on the Valley is also provided in Section 12.1. Based on the information obtained during the data collection process, the Torpedo Burial Site may contain electrically fuzed munitions. It is not suspected to contain CWM-filled munitions or DU-associated munitions. The Torpedo Burial Site was used for the disposal of torpedoes, casings, primers, detonators, fuzes, and squibs. Historical documents report that these munitions types were buried at the site over a period of no less than 5 years.

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 9-1.

9.12 MUNITIONS CONSTITUENTS

MC are suspected to be present at this site. MC commonly found in torpedoes include the following:

- TNT
- RDX
- Composition A
- Composition B
- Composition C
- Torpex
- PETN
- Dynamite

- Nitrocellulose
- Cordite
- Perchlorate

The relative concentrations of these MC are not known, but are not anticipated to exceed 10 percent in soil. No MC were observed during the 2003 visual survey. There was no record found of any excavations or environmental sampling on the site. The Torpedo Burial Site is overlapped by the firing fan from the Valley, located at the Main Installation. Thus, there is a potential for munitions associated with the Valley to be present at the Torpedo Burial Site. Only the munitions constituents that specifically relate to the Torpedo Burial Site are considered in this section.

9.13 SITE FIELDWORK

9.13.1 Background

Limited pre-survey clearing to allow geophysical data collection on 5-foot-spaced survey lines was required.

The Torpedo Burial Site is adjacent to the EOD School Demolition Area. Reportedly, the Torpedo Burial Site is believed to have possibly been used to dispose of torpedoes (potentially live) in at least one trench. A torpedo casing was visible in a depression near the southwestern corner of the site. Therefore, a geophysical investigation was conducted using a planned 5-foot survey line spacing to provide thorough coverage for detection of buried metal caches across the accessible portions of the site identified in the PA.

The initial horizontal boundary was defined as the suspect MEC area as shown in the PA and on Figure 9-1.

The initial vertical boundary for the MEC investigation (detector-aided surface sweeps and geophysical investigation) was 6 feet bgs within the land area.

9.13.2 Scope

The scope of survey activities at the Torpedo Burial Site is summarized below (see Figure 9-1).

- Brush and vegetation clearing was necessary to support the detector-aided surface sweeps and geophysical investigation.

- UXO detector-aided surface sweeping of the geophysical survey area.

- Geophysical surveying across accessible portions of the site using a planned 5-foot survey line spacing.

- Consulting with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate MC UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH IR Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items left in place were avoided during subsequent geophysical surveying. No MEC items were moved or disturbed during this phase of the project. Surface MD were reported on the log sheets or the logbook for the site.

9.13.3 Site Preparation

Brush cutting and vegetation removal to support the detector-aided surface sweep were conducted to the degree necessary to allow the metal detector to get within a few inches of the ground surface. The magnetic detector is approximately 1 inch in diameter and is durable; therefore, it is possible to push the detector through brush and vegetation, and as a result, less brush cutting and vegetation removal was required. The all-metals detector has a detection head of approximately 8 inches and is more fragile than the magnetometer. Therefore, brush and vegetation was cleared to within a few inches of the ground surface.

The site is wooded and required brush and vegetation cutting in the abovementioned geophysical survey area. The area needed to be clear-cut of brush and vegetation to a level no greater than 6 inches above the ground surface to permit the passage of survey equipment.

The current site investigation at the Torpedo Burial Site was limited to detector-aided surface and subsurface geophysical investigations.

9.13.4 UXO Detector-Aided Surface Sweep

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix E.

A 100 percent detector-aided surface sweep of the site was conducted within the area shown on Figure 9-1. The sweep was conducted by UXO technicians using hand-held metal detectors (Schonstedt GA-52Cx). The all-metals detector was either used in place of, or in conjunction with, the magnetic locator. The decision as to whether one or both detectors should be used was based on the ability to place the sensor of the all-metals detector within 1 foot of the ground surface, the relative proportion of ferrous MEC items to non-ferrous MEC items, and the types of items visually observed and their relative potential to be MEC or MPPEH.

The general UXO detector aided survey was conducted as described in Section 3a.3. Locations where visual observations of suspect MEC, MPPEH, MD or subsurface anomalies were observed were marked with a stake. Pictures were taken of items observed on the surface. In clear areas the locations were recorded using a GPS. In areas where tree canopy precluded use of a GPS, locations were established using a tape measure and compass measurements from a known location(s). All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures. The MEC hazard assessment methodology is described in Section 3a.5. MEC documentation is described in Section 3a.7.

9.13.5 Geophysical Survey

A Geometrics G-858G magnetometer was used at the site because the expected targets of the site (torpedo casings) were expected to be ferrous metal objects, and the magnetometer instrument is portable in a wooded setting. The geophysicist conducted the geophysical survey along parallel survey lines spaced 5 feet apart trending in one direction providing thorough coverage for detecting large targets such as torpedo casings. GPS data were integrated at 1 second intervals to position the geophysical data. Based on former site usage, it is anticipated that potential target anomalies were shallow (within 2 feet bgs) and would generate large instrument responses. Targets of the geophysical investigation included large object sizes (torpedoes) at this site, and therefore survey detection depths were expected to be several feet.

Before the geophysical survey began, the UXO team conducted a visual and detector-aided surface sweep of the survey area. No suspect MEC was found during the surface sweep.

9.14 DEVIATIONS FROM WORK PLAN

There were no deviations from the work plan.

9.15 MEC SURVEY RESULTS

The Field Forms are included in Appendix C. The UXO Surface Survey Activities are summarized from the daily and weekly logs at the Torpedo Burial Site below.

On November 19, 2009, UXO Team completed all necessary brush cutting in the Torpedo Burial Site.

9.15.1 UXO Detector-Aided Surface Survey Results

On November 21 through 24, 2009, the Schonstedt GA-52Cx and White's XLT sweep of the Torpedo Burial Site was completed. One MD item, a rusted and fragmented torpedo casing made of ferrous metal, was located mostly underwater near the southwest boundary of the site (Table ES-2).

Figure 9-2 illustrates the Torpedo Burial Site MD Find Location and Table 9-2 details the MD find. Appendix D presents a photograph of the MD item discovered during the detector-aided surface sweeps and is also presented below.

9.15.2 Geophysical Survey Results

Figure 9-3 displays the interpretation of the site data. Although the site is wooded, a semi-open canopy permitted integrated GPS measurements; however, the positional data is considered approximate given the presence of trees and the partial canopy they create. Anomalies auto-selected (picked) using the Blakely Test (anomalies 50 and higher in Analytic Signal) from the UX-Detect module of Geosoft are shown by "+" symbols with a number identifier, and are identified as buried ferrous metallic items. Items were picked to identify small to large object potentials in case small MEC items or MPPEH pieces from larger items might be unexpectedly present. Sixty-eight picked anomalies are shown on figure with their corresponding georeferenced coordinates listed separately in Appendix E, Table 9-3. Most of the items are present in the western portion of the site. Anomalies considered large enough to possibly represent torpedoes or torpedo casings or other substantial metal are located at the three concentrations of buried ferrous metallic items areas annotated near the western edge of the site, and less likely but possibly at anomalies 39 and 67 in the eastern half of the site. The anomalies at the western edge of the site are not fully delineated, and extend offsite. The nature of the buried ferrous metallic items cannot be determined from the geophysical data alone; however, given the site's history of military training and the quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond.

Aboveground objects displayed in the legend as surface metals (non-munitions related) appear in a few locations to create data anomalies. The presence or absence of additional items (and potential targets) in these areas cannot be determined from the geophysical data alone.

9.16 MC SAMPLING PROGRAM

Information from the detector-aided surface sweep and geophysical survey, about the presence of MD and shallow subsurface anomalies, was utilized to identify surface and subsurface MC soil sampling locations, and to determine if contamination exists. Tetra Tech consulted with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate UFP SAP). A total of 20 soil samples were collected at 10 locations at the Torpedo Burial Site. Table 9-3 lists the soil and sediment sampling locations and the justification for selecting those locations.

If no suspect MEC, MPPEH, or subsurface anomaly clusters were observed, the samples were collected at the UFP SAP proposed locations. Figure 9-4 illustrates the sampling locations in conjunction with the MEC detector-aided surface sweep and geophysical survey findings at the Torpedo Burial Site. All

surface soil samples were collected via hand auger and subsurface soils were collected by DPT and submitted to the fixed-base laboratory for explosives analysis. Three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis.

The CSM (detailed in Appendix B of Volume I of the UFP SAP) indicated that potentially complete exposure pathways existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist. The updated CSM is included in Section 9.23.

9.16.1 MC Sample Collection and Analysis

Soil sample locations were selected based on a bias towards areas that were believed to be most likely contaminated by past operations at the site. The total area of the site is 0.88 acres as indicated in Table ES-1. See Figure 9-4 for all sample locations. Prior to initiating sample collection, all sample locations were marked by colored pin flags bearing the sample location ID number. Collected sample locations identified in the approved UFP SAP were located by GPS and by measurements from stationary objects (e.g., roadways, existing buildings).

Subsurface Soil/ Sediment/ Surface Water

a) Twenty discrete subsurface soil samples were collected from 2 to 4 and 4 to 6 feet bgs at 10 soil sample locations. Two samples were collected within that depth interval at each location based on visual observations of staining or other relevant indications (odors, discoloration, etc.). If these indications were not observed, samples were collected at 2 to 4 feet bgs and 4 to 6 bgs. All subsurface soil samples were analyzed for explosives (SW-846 Method 8330B).

b) Two discrete sediment samples were collected from 0 to 0.5 feet bgs at two sample locations from the drainage ditch that bisects the property to determine if explosive contamination is being carried through the site via surface water runoff. All sediment samples were analyzed for explosives (SW-846 Method 8330B).

c) One surface water sample was collected from the drainage ditch that bisects the property to determine if explosive contamination is being carried through the site via surface water runoff. This surface water sample was analyzed for explosives (SW-846 Method 8330B).

d) Two soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

e) Subsurface soil samples were collected via DPT.

f) Sediment samples were collected via disposable trowel.

g) The surface water sample was collected by directly dipping the sample container into the surface water.

h) Anomaly avoidance techniques were followed for collection of all sediment/soil samples.

Soil sample log sheets are included in Appendix F of this document.

9.17 WORK PLAN DEVIATIONS

There were no deviations from the work plan.

9.18 SITE INSPECTION DATA COLLECTION RESULTS

9.18.1 MC Sampling Results

All soil samples collected were compared to the PALs and background sampling results, and a statistical evaluation was done to compare the background data with the site sampling results. The summary tables of the site background screening and PALs are presented in Appendix H, and the MC analytical results are also presented in Appendix H. The data validation reports are presented in Appendix I. The statistical summary and calculations are presented in Appendix J. Tables 9-4, 9-5, and 9-6 summarize the results as compared to the calculated screening values for explosives in subsurface soil, sediment, and surface water, respectively. The PAL was the reference limit, unless the background and screening calculations exceeded this value. In Tables 9-4, 9-5, and 9-6, if a parameter had an exceedance at any sampling point, the parameter is highlighted; individual sample exceedances are also highlighted.

9.19 DATA QUALITY REVIEW/USABILITY

9.19.1 Data Quality Review of Samples at Stump Neck Impact Area

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for the Torpedo Burial Site were of acceptable quality for use in decision-making. The review began with data validation, which is a comparison of DQIs against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as "U," "J," "R," "L," "K," or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the DQOs of the project. The DQOs presented in the Munitions Response Program Site Inspections at Ten Munitions Response Program Ranges QAPP (September 2009) were maintained through the course of the sampling event. The Worksheets #19 and #15 of the QAPP present the analytical methods and compounds analyzed.

Table 6 in Appendix I presents all the qualified data and the reason for the data qualification. The rejection of data was not necessary for samples collected at the Torpedo Burial Site and all data are considered valid for their intended purpose.

The sample collection and laboratory analytical completeness were 100 percent.

The LQL exceeds the PAL for nitroglycerin. For comparison to risk screening criteria for COPC selection, one half the laboratory QL was used.

Table 6 in Appendix I shows that several results were qualified because of LCS, matrix spike, serial dilution, percent difference between columns, and calibration noncompliances. The noncompliances in general do not show any directional bias with the data except for HMX, 1,3,5-trinitrobenzene, 2,4,6-trinitrotoluene, and tetryl. HMX had LCS recoveries less than the laboratory quality control limit but greater than 30 percent, indicating a slight low bias. The compounds 1,3,5-trinitrobenzene, 2,4,6-trinitrotoluene, and tetryl had matrix spike recoveries less than the laboratory quality control limit but greater than 30 percent for sample (X12SW001). This indicates a slight low bias for 1,3,5-trinitrobenzene, 2,4,6-trinitrotoluene, and tetryl in sample X12SW001. HMX had a matrix spike recovery less than the laboratory quality control limit but greater than 30 percent for one sample (X12SD001). This indicates a slight low bias for RDX and tetryl in sample X12SD001. All other matrix

spike recoveries were acceptable. Overall, the laboratory accuracy was acceptable and no data were rejected. There were no quality control deficiencies noted for field accuracy.

No data were qualified because of laboratory or field duplicate precision noncompliances.

No comparability issues were noted during the data validation process.

Based on field logs indicating the conditions during sample collection and laboratory audits, all reported data are adequately representative of site conditions and intended populations.

9.20 DATA COMPARISON TO PROJECT ACTION LIMITS

Twenty discrete subsurface soil samples (2 to 4 feet and 4 to 6 feet bgs) were sent to the FBL for explosives analyses using SW 846 Method 8330B. Two sediment (0 to 0.5 feet bgs) soil samples were sent to the FBL for explosives analyses using SW 846 Method 8330B. One surface water sample was sent to the FBL for explosives analyses using SW 846 Method 8330B.

9.20.1 Subsurface Soil

Table 9-4 summarizes the results as compared to the calculated screening values for explosives in subsurface soil. There were two low level J detections of nitroglycerin in the discrete subsurface soils. No other explosive constituents were detected.

Three soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

9.20.2 Sediment

Table 9-5 summarizes the results as compared to the calculated screening values for explosives in sediment. There were no detections of explosives in sediment.

9.20.3 Surface Water

Table 9-6 summarizes the results as compared to the calculated screening values for explosives in surface water. The surface water sample, X12SW001, had a detection of 0.33 L µg/L for 2,4,6-trinitrotoluene, and 0.033 J µg/L for 2,4-dinitrotoluene.

Based on results, a human health risk screening evaluation was not performed. Based on detections of explosives in surface water, an ecological risk screening was performed and is discussed in Section 9.21.

9.20.4 CEC, pH, and TOC

One representative soil sample per sampling depth (2 to 4 feet and 4 to 6 feet) was shipped to the FBL for CEC, pH, and TOC analyses. CEC was detected at 52.3 mEq/100 at X12SB0010204 and 72.2 mEq/100 at X12SB0010406. PH was detected at 4.35 S.U. at X12SB0010204 and 4.92 S.U. at X12SB0010406. TOC was detected at 3820 mg/kg at X12SB0010204 and 65 mg/kg at X12SB0010406. There are no PALs for CEC or pH. The surface background TOC is 57,200 mg/kg and the subsurface background TOC is 66,500 mg/kg. TOC is a measure of the total amount of nonvolatile, volatile, partially volatile, and particulate organic compounds in a sample. The TOC values were less than background. The mobility of metals is influenced by pH and CEC. CEC is a calculated value that is an estimate of the ability of the soil to attract, retain, and exchange cations. Soils with CEC above 10 mEq have a higher clay content and a lower sand content with many positions to hold cations. In general, metal cations are most mobile under acidic conditions, and a pH of 7 is neutral. The pH level in this sample would be considered acidic. The mobility of metals generally increases with decreasing soil pH and CEC.

9.21 ECOLOGICAL RISK SCREENING

Only two chemicals had positive detections in one sample at location X12SW001 in UXO-12 surface water; 2,4,6-trinitrotoluene (0.33 µg/L), and 2,4-dinitrotoluene (0.033 µg/L). The data for these samples are provided in Table 9-6 and in Appendix H. Both of these concentrations are much less than the USEPA Region 3 Freshwater Screening levels of 100 µg/L and 44 µg/L for 2,4,6-trinitrotoluene and 2,4-dinitrotoluene, respectively. Therefore, these chemicals are not considered ecological COPCs for aquatic biota at UXO-12. These screening levels are not shown in table 9-6, as they were not provided in the UFP SAP.

9.22 WORK PLAN DEVIATIONS

There were no deviations from the work plan.

9.23 UPDATED CSM

Only MC associated with the Torpedo Burial Area are considered in the CSM exposure pathway analysis. This general description of the CSM exposure pathway analysis was included in Section 10.8.11 of the SAP: “Historical evidence indicates that MEC may be present at the Torpedo Burial Area; however, the

density of the MEC is unknown. Therefore, potentially complete pathways exist for human and ecological receptors for MEC in surface and subsurface soil. This includes receptors for hand/tread underfoot contact and surface intrusive work that may be conducted at the Torpedo Burial Area. These activities include, but are not limited to, excavation, plowing, tilling, construction, and environmental sampling for human receptors. Ecological receptors may come in contact with MEC through burrowing, nesting or feeding activities that disturb surface soil. Trespassers are anticipated to be exposed via non-intrusive surface soil activities at the site, but it is unlikely they would be exposed to subsurface soil through intrusive activities." A three dimensional depiction of the Torpedo Burial Site is provided as Figure 9-5. One pathway is runoff from precipitation. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil, soil, and sediment. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses.

9.24 EXPOSURE PATHWAY ANALYSIS

An Exposure Pathway Analysis for MEC is presented as Figure 9-6A. Sixty-eight anomalies were discovered during the geophysical investigation. The nature of the buried ferrous metallic items cannot be determined from the geophysical data alone; however, given the site's history of military training and the quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond.

As illustrated in the MC Exposure Pathway Analysis (Figure 9-6B), soil and surface water impacted by MC represent a primary source medium. Exposures to surface soil, subsurface soil, and surface water/sediment containing explosives were detected during the MC sapling investigation and present complete exposure pathways for human and ecological receptors. All human and ecological receptors have potentially complete exposure pathways for direct contact with MC in surface soil, which includes dermal contact, ingestion, and inhalation (dust). Runoff, discharges, and/or erosion may transport MC from surface soil to surface water/sediment. Precipitation infiltration may provide for contaminant mobility into the subsurface soil and into the shallow surficial aquifer, which is assumed to be connected to nearby surface water bodies. Because the Torpedo Burial Site is located within a hunting area, human and ecological receptors have a complete exposure pathway by ingesting game/prey that have consumed contaminated vegetation or prey. Complete exposure pathways exist for MC in subsurface soil (direct contact, ingestion, and inhalation during intrusive work activities) for all human and ecological receptors. It is not anticipated that trespassers would come in contact with subsurface soil. Although confining layers are expected to prevent the migration of MC to the lower aquifers used for water supplies, complete explosure pathways exist for MC in shallow groundwater for human receptors.

9.25 CONCLUSIONS

- This site is undeveloped, and there is no evidence of utilities on the Torpedo Burial Site. According to installation personnel, there are no planned future activities at the site**.**

- According to available reports, the site consists of at least one unlined earthen pit used to bury waste material including torpedoes, primers, detonators, fuzes, squibs, and other associated hardware transported from a torpedo station near Washington, D.C., in the late 1940s or early 1950s. The entire Torpedo Burial Site is considered a suspected MEC area, although the 21-inch torpedo casing discovered during the visual survey is the only known MEC area.

- Sixty-eight anomalies were discovered during the geophysical survey. Most of the items are present in the western portion of the site. Anomalies considered large enough to possibly represent torpedoes or torpedo casings or other substantial metal are located at the three concentrations of buried ferrous metallic items areas annotated near the western edge of the site, and less likely but possibly at anomalies 39 and 67 in the eastern half of the site.

- There were no exceedances of explosives in the subsurface or sediments; therefore, there were no MC of concern identified for ecological screening. However, there were low level detections of nitroglycerin in subsurface soils.

- There were detections of 2,4,6-trinitrotoluene (0.33 µg/L) and 2,4-dinitrotoluene (0.033 µg/L) in surface water; therefore, the extent of potential environmental contamination at the site appears to be limited.

- The CSM and Exposure Pathway Analyses indicate that complete exposure pathways exist for MEC and complete exposure pathways exist for MC for both human and ecological receptors under both current and hypothetical future land uses. Unacceptable levels of human and/or ecological risk may exist. However groundwater is not currently used at the site.

9.25.1 Data Gaps

There were no data gaps.

9.26 RECOMMENDATIONS FOR NEXT PHASE

Though the nature of the buried ferrous metallic items cannot be determined from the geophysical data alone, given the site's history of military training and the quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond at the Torpedo Burial Site (UXO-12). Most of the items are present in the western portion of the site. The nature of these buried metallic items cannot be determined from the geophysical data, and can only be characterized through intrusive investigation. Based on these results, a more extensive evaluation, in the form of an RI, is recommended for UXO-12. The scope of effort for the RI, which will include further characterization, delineation, and intrusive investigations, will be determined during project planning.

MEC

Proceed to an RI. The RI should include:

- Clearance of surface MEC/MPPEH and non-munition debris.
- Subsurface geophysical investigation.
- Investigation of representative subset of subsurface anomaly discovered during the geophysical investigation.

MC

- No further action is recommended, however MC sampling if subsurface MEC/MPPEH are found.

TABLE 9-1

MUNITION TYPES AND CHEMICALS
TORPEDO BURIAL SITE - UXO 12
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

UNITIONS TYPES USED/STORED AT THE FACILI	ASSOCIATED CHEMICAL CONSTITUENTS
Torpedoes	TNT (2,4,6-trinitrotoluene)
	RDX (Cyclotrimethylenetrinitramine)
	Composition A (RDX and plasticizing Wax)
	Composition B (59/40/1/ mixture of RDX, TNT and beeswax)
	Composition C (RDX, other explosives, plasticizer)
	Torpex (42% RDX, 40% TNT and 18% powdered aluminium)
	PETN (Pentaerythritol tetranitrate)
	Military Dynamite (75 percent RDX (Cyclotrimethylenetrinitramine), 15 percent TNT, 5 percent motor oil.
	Nitrocellulose
	Cordite (37% nitrocellulose (13.1% Nitrogen), 58% nitroglycerine and 5% petroleum jelly)
	Perchlorates (salts derived from perchloric acid (HClO4))
Demolition charges: primers, detonators, fuzes, and squibs, casings.	Blackpowder (potassium nitrate, sulphur, charcoal or coal, nitrocellulose)
	Metals
	Chloroform
	bis(2 ethylhexyl) phthalate (BEHP)

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 9-2

TORPEDO BURIAL SITE
MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

FACILITY	Stump Neck Annex of Indian Head MD
SITE NUMBER & NAME	112G00810 MMRP Site Investigation

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition			Notifications Completed (indicate w/ √ as applicable)	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
11/18/2009	1445	Torpedo Burial Site	TBS-01			X	322677.64	1249510.80	Casing, Torpedo	Rusted and			11/21/2009	X	TBS-01

TABLE 9-3

MC SAMPLING PROGRAM
TORPEDO BURIAL SITE - UXO 12
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Sampling Locations	Justification
X12SB001	Geophysical Anomolies
X12SB002	Geophysical Anomolies
X12SB003	Geophysical Anomolies
X12SB004	Geophysical Anomolies
X12SB005	Geophysical Anomolies
X12SB006	Geophysical Anomolies
X12SB007	Geophysical Anomolies
X12SB008	Geophysical Anomolies
X12SB009	Geophysical Anomolies
X12SB010	Geophysical Anomolies
X12SD001\X12SW001	Surface drainage area (Sediment/Surface water)
X12SD002	Surface drainage area (Sediment)

TABLE 9-4

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column2		column4		column6		column7		column9		column12		column14		column16	
	nsample			X12SB0010204		X12SB0010406		X12SB0020204		X12SB0020204-AVG		X12SB0020204-D		X12SB0030204		X12SB0030406		X12SB0040204	
	location			X12SB001		X12SB001		X12SB002		X12SB002		X12SB002		X12SB003		X12SB003		X12SB004	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X12SB0010204		X12SB0010406		X12SB0020204		X12SB0020204-AVG		FD031010-01		X12SB0030204		X12SB0030406		X12SB0040204	
	gis_date			20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310	
	sacode			NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate											X12SB0020204							
	top_depth				2.00		4.00		2.00		2.00		2.00		2.00		4.00		2.00
	bottom_dep				4.00		6.00		4.00		4.00		4.00		4.00		6.00		4.00
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB	
	z			001		003		005		006		008		011		013		015	
cas	x	utl95	minorpal	c_001		c_003		c_005		c_006		c_008		c_011		c_013		c_015	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	U	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	52.3	J	72.2	J	61.4		61.4	J								
TTNUS288	PERCENT MOISTURE (%)	NA	NC	17.5		20.7		18.2		18.2									
TTNUS002	PH (S.U.)	NA	NC	4.35		4.92		4.22		4.22									
TTNUS002	TOTAL ORGANIC CARBON (mg/kg)	**66500**	NC	3820		65		63		63									
TTNUS046	TOTAL SOLIDS (%)	NA	NC	82.5		79.3		81.8		81.8									

TABLE 9-4

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column18		column20		column22		column24		column26		column28		column30		column32	
	nsample			X12SB0040406		X12SB0050204		X12SB0050406		X12SB0020406		X12SB0060204		X12SB0060406		X12SB0070204		X12SB0070406	
	location			X12SB004		X12SB005		X12SB005		X12SB006		X12SB006		X12SB006		X12SB007		X12SB007	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X12SB0040406		X12SB0050204		X12SB0050406		X12SB0020406		X12SB0060204		X12SB0060406		X12SB0070204		X12SB0070406	
	gis_date			20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																		
	top_depth			4.00		2.00		4.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			6.00		4.00		6.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB	
	z			017		019		021		023		025		027		029		031	
cas	x	utl95	minorpal	c_017		c_019		c_021		c_023		c_025		c_027		c_029		c_031	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.23	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.23	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	U	0.2	UL	0.2	UL	0.19	UL	0.19	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	0.26	J	1.2	U	0.25	J	1.2	U	1.2	U	1.2	U	1.1	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
	Miscellaneous Parameters																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC																
TTNUS288	PERCENT MOISTURE (%)	NA	NC																
TTNUS002	PH (S.U.)	NA	NC																
TTNUS002	TOTAL ORGANIC CARBON (mg/kg)	**66500**	NC																
TTNUS046	TOTAL SOLIDS (%)	NA	NC																

TABLE 9-4

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column34		column36		column38		column40		column42		column44	
	nsample			X12SB0080204		X12SB0080406		X12SB0090204		X12SB0090406		X12SB0100204		X12SB0100406	
	location			X12SB008		X12SB008		X12SB009		X12SB009		X12SB010		X12SB010	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X12SB0080204		X12SB0080406		X12SB0090204		X12SB0090406		X12SB0100204		X12SB0100406	
	gis_date			20100310		20100310		20100310		20100310		20100310		20100310	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO	
	duplicate														
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB	
	z			033		035		037		039		041		043	
cas	x	utl95	minorpal	c_033		c_035		c_037		c_039		c_041		c_043	
	Explosives (mg/kg)														
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters														
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC												
TTNUS288	PERCENT MOISTURE (%)	NA	NC												
TTNUS002	PH (S.U.)	NA	NC												
TTNUS002	TOTAL ORGANIC CARBON (mg/kg)	**66500**	NC												
TTNUS046	TOTAL SOLIDS (%)	NA	NC												

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 9-5

SEDIMENT SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

nsample										X12SD001		X12SD001-AVG		X12SD001-D		X12SD002	
location										X12SD001		X12SD001		X12SD001		X12SD002	
project_no										00810_2010060		00810_2010060		00810_2010060		00810_2010060	
sample_coc										X12SD001		X12SD001-AVG		FD031810-03		X12SD002	
sample_date										20100318		20100318		20100318		20100318	
qc_type										NM		NM		FD		NM	
sacode										ORIG		AVG		DUP		NORMAL	
matrix										SD		SD		SD		SD	
duplicate														X12SD001			
top_depth											0.00		0.00		0.00		0.00
bottom_dep											0.50		0.50		0.50		0.50
depth_unit										FT		FT		FT		FT	
z	UTL95	MINORPAL	ORNL	ORNL_B	BTAG	TEC	NOAA	SUN	REFERENCE	001		002		004		007	
x										c_001	c_006	c_002	c_003	c_004	c_005	c_007	c_008
Explosives (mg/kg)																	
1,3,5-TRINITROBENZENE	NA	8	2200	N	NA	NA	NA	8	Sunahara	0.2	U	0.2	U	0.2	U	0.2	U
1,3-DINITROBENZENE	NA	6.1	6.1	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U
2,4,6-TRINITROTOLUENE	NA	0.092	36	N[9]	0.092	NC	NC	NA	R3BTAG	0.25	U	0.25	U	0.25	U	0.25	U
2,4-DINITROTOLUENE	NA	0.0416	16	C	0.042	NC	NC	NC	R3BTAG	0.2	U	0.2	U	0.2	U	0.2	U
2,6-DINITROTOLUENE	NA	61	61	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U
2-AMINO-4,6-DINITROTOLUENE	NA	150	150	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U
2-NITROTOLUENE	NA	29	29	C	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U
3,5-DINITROANILINE	NA	NA	NA		NA	NA	NA	NC	ORNL-R	0.25	U	0.25	U	0.25	U	0.25	U
3-NITROTOLUENE	NA	6.1	6.1	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U
4-AMINO-2,6-DINITROTOLUENE	NA	150	150	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U
4-NITROTOLUENE	NA	4.06	300	C	4.06	NC	NC	NC	R3BTAG	0.2	U	0.2	U	0.2	U	0.2	U
HMX	NA	126	3800	N	NA	NA	NA	126	Sunahara	0.2	UL	0.2	UL	0.2	UL	0.2	UL
NITROBENZENE	NA	0.021	48	C	NA	NA	0.021[8]	NC	NOAA SQUIRT	0.2	U	0.2	U	0.2	U	0.2	U
NITROGLYCERIN	NA	6.1	6.1	N	NA	NA	NA	NC	ORNL-R	1.2	U	1.2	U	1.2	U	1.2	U
PETN	NA	NA	NA		NA	NA	NA	NC	ORNL-R	1.2	UJ	1.2	UJ	1.2	UJ	1.2	UJ
RDX	NA	0.013	55	C	0.013	NC	NC	102	R3BTAG	0.2	U	0.2	U	0.2	U	0.2	U
TETRYL	NA	0.1	240	N	NA	NA	NA	0.1	Sunahara	0.2	U	0.2	U	0.2	U	0.2	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 9-6

SURFACE WATER SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

nsample	X12SW001		X12SW001-AVG		X12SW001-D	
location	X12SW001		X12SW001		X12SW001	
project_no	00810_2010060		00810_2010060		00810_2010060	
sample_coc	X12SW001		X12SW001-AVG		FD031810-04	
sample_date	20100318		20100318		20100318	
qc_type	NM		NM		FD	
sacode	ORIG		AVG		DUP	
matrix	SW		SW		SW	
duplicate					X12SW001	
depth_unit	NA		NA		NA	
z	001		002		004	
x	c_001	c_006	c_002	c_003	c_004	c_005
Explosives (ug/L)						
1,3,5-TRINITROBENZENE	0.2	UL	0.2	UL	0.2	U
1,3-DINITROBENZENE	0.2	U	0.2	U	0.2	U
2,4,6-TRINITROTOLUENE	**0.33**	**L**	**0.215**	**L**	0.2	U
2,4-DINITROTOLUENE	**0.033**	**J**	**0.033**	**J**	0.2	U
2,6-DINITROTOLUENE	0.2	U	0.2	U	0.2	U
2-AMINO-4,6-DINITROTOLUENE	0.2	U	0.2	U	0.2	U
2-NITROTOLUENE	0.2	U	0.2	U	0.2	U
3,5-DINITROANILINE	0.2	U	0.2	U	0.2	U
3-NITROTOLUENE	0.2	U	0.2	U	0.2	U
4-AMINO-2,6-DINITROTOLUENE	0.2	U	0.2	U	0.2	U
4-NITROTOLUENE	0.2	U	0.2	U	0.2	U
HMX	0.2	U	0.2	U	0.2	U
NITROBENZENE	0.2	U	0.2	U	0.2	U
NITROGLYCERIN	1.5	UJ	1.5	UJ	1.5	UJ
PETN	1.5	U	1.5	U	1.5	U
RDX	0.2	U	0.2	U	0.2	U
TETRYL	0.3	UL	0.295	UL	0.29	U

ug/L= microgram per liter
Bold means chemical was detected.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD\SN_TORPEDO_BURIAL_MEC.MXD 5/28/10 KM

1249500 1249750 1250000

322750

N

100% Detector-Aided Sweep and
Geophysical Survey (using 5-foot line spacing shown)

Torpedo Casing on Ground Surface

Legend

- Evidence of Munitions Usage
- MRP Area Boundary Identified During PA
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

50 25 0 50 Feet

DRAWN BY K. MOORE	DATE 08/24/07
CHECKED BY E. BERKLITE	DATE 5/28/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

TORPEDO BURIAL SITE (UXO-12)
MEC INVESTIGATION LOCATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055	
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 9-1	REV 0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD\SN_TORPEDO_MEC_FINDS.MXD 5/7/10 KM

1249500 1249750 1250000

322750

N

Torpedo Casing on Ground Surface

Legend

- MPPEH
- Evidence of Munitions Usage
- MRP Area Boundary Identified During PA
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

50 25 0 50 Feet

DRAWN BY K. MOORE	DATE 1/14/10
CHECKED BY E. BERKLITE	DATE 5/7/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

TORPEDO BURIAL SITE (UXO-12)
MEC FINDS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055	
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 9-2	REV 0

1249500 1249750 1250000

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1249500 1249750 1250000

322750

N

NOTE: Geometrics G-858G data shown

Legend

- Buried Ferrous Metallic Items (with unique identifier) 68 Anomalies Identified
- Surface Metals (non-muntions related)
- MRP Area Boundary Identified During PA
- Surface Drainage
- Concentrations of Buried Ferrous Metallic Items
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

613
529
471
420
386
355
328
302
279
257
236
212
193
175
156
139
121
104
87
66
49
31
14
-4
-22
-41
-60
-84
-105
-127
-150
-175
-202
-233
-268
-318
-376
-461

Vertical Magnetic Gradient
Analytic Signal

50 25 0 50
Feet

DRAWN BY K. MOORE	DATE 1/14/10
CHECKED BY E. BERKLITE	DATE 7/9/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

TORPEDO BURIAL SITE (UXO-12)
GEOPHYSICAL ANOMALIES LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055	
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 9-3	REV 0

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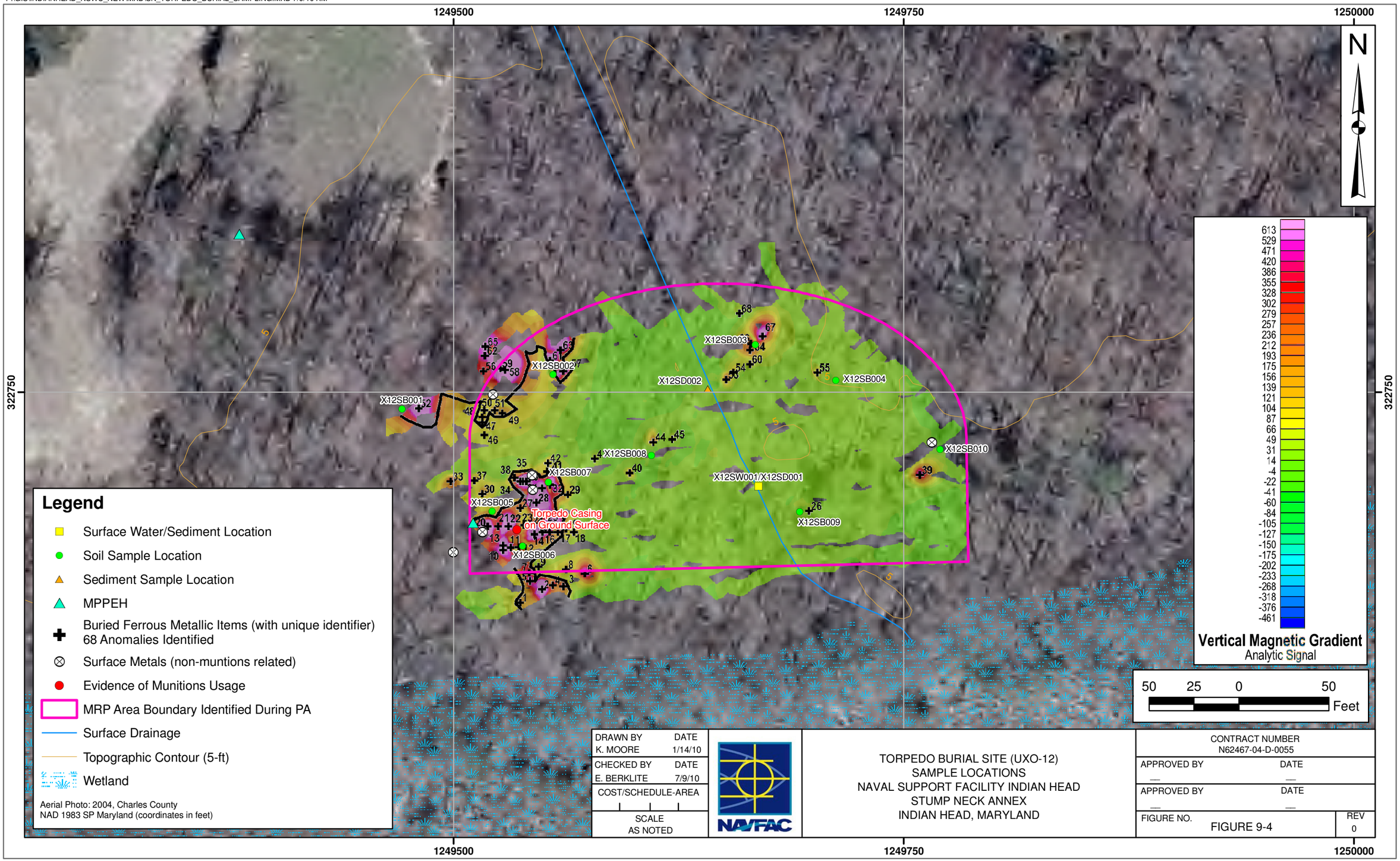


Legend

- Surface Water/Sediment Location
- Soil Sample Location
- Sediment Sample Location
- MPPEH
- Buried Ferrous Metallic Items (with unique identifier)
  68 Anomalies Identified
- Surface Metals (non-muntions related)
- Evidence of Munitions Usage
- MRP Area Boundary Identified During PA
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	1/14/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	AS NOTED

NAVFAC

TORPEDO BURIAL SITE (UXO-12)
SAMPLE LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 9-4	0

LEGEND

MRP AREA BOUNDARY IDENTIFIED DURING PA

SURFACE DRAINAGE

WATER TABLE (ESTIMATED)

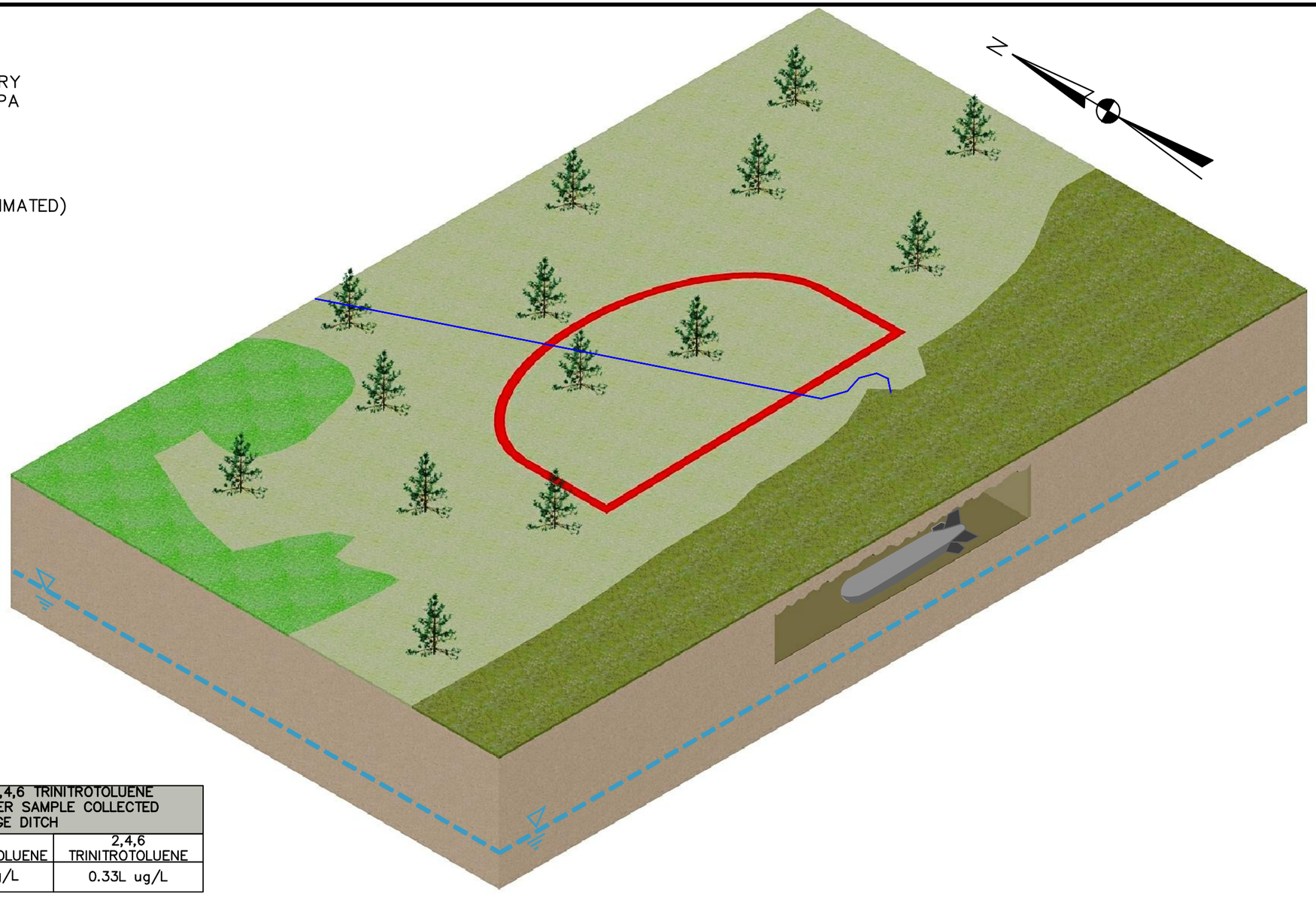
GRASS

WETLANDS

FOREST

TORPEDO

TREE



2,4 DINITROTOLUENE AND 2,4,6 TRINITROTOLUENE OBSERVED IN SURFACE WATER SAMPLE COLLECTED FROM DRAINAGE DITCH		
SAMPLE I.D.	2,4 DINITROTOLUENE	2,4,6 TRINITROTOLUENE
X12SW001	0.033 ug/L	0.33L ug/L

DRAWN BY ND	DATE 6-14-10	TORPEDO BURIAL SITE UXO-12 CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND	CONTRACT NO. 0810
CHECKED BY	DATE		OWNER NO.
REVISED BY	DATE		APPROVED BY DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 9-5 / REV. 0

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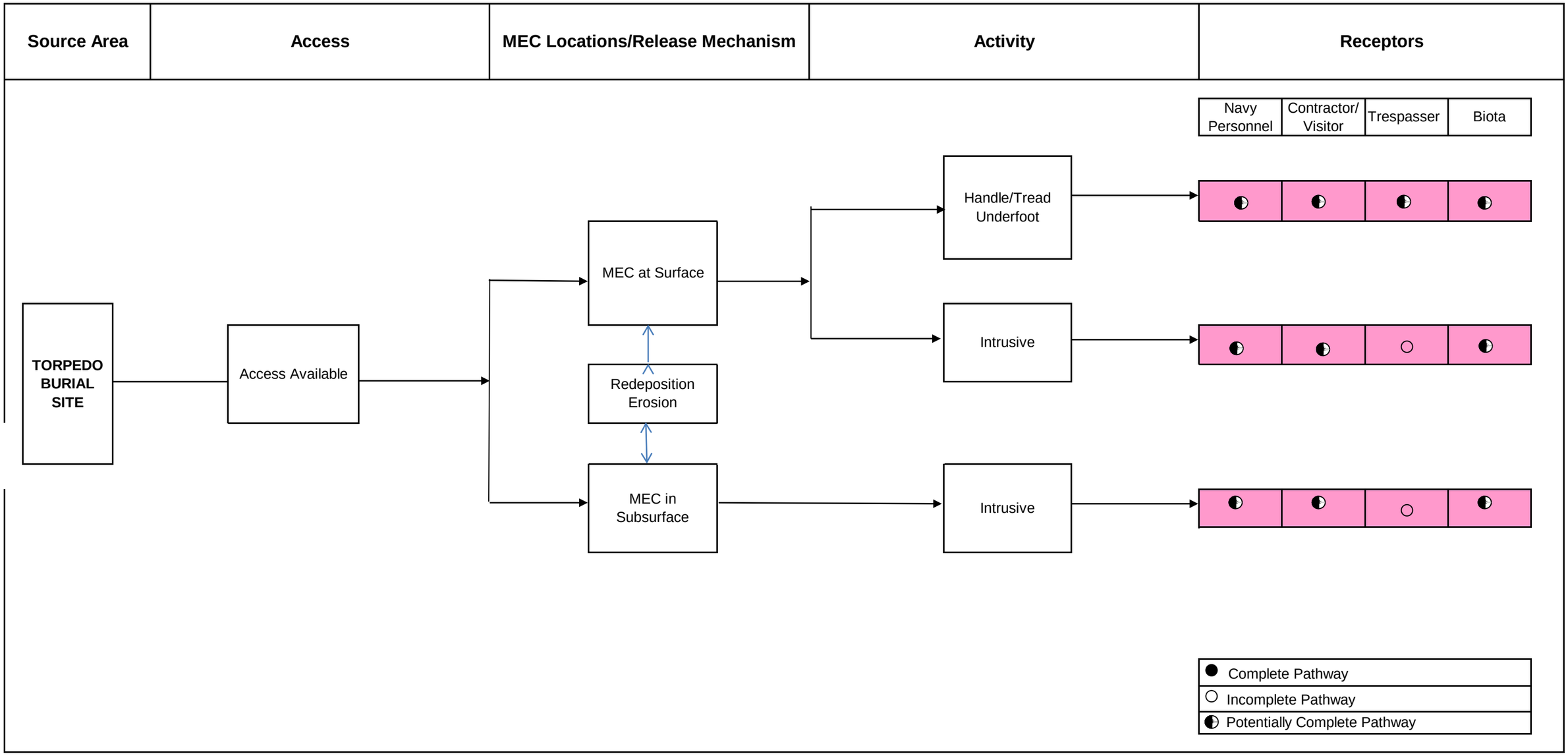
9-6A

MEC EXPOSURE PATHWAY ANALYSIS

TORPEDO BURIAL SITE UXO 12

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

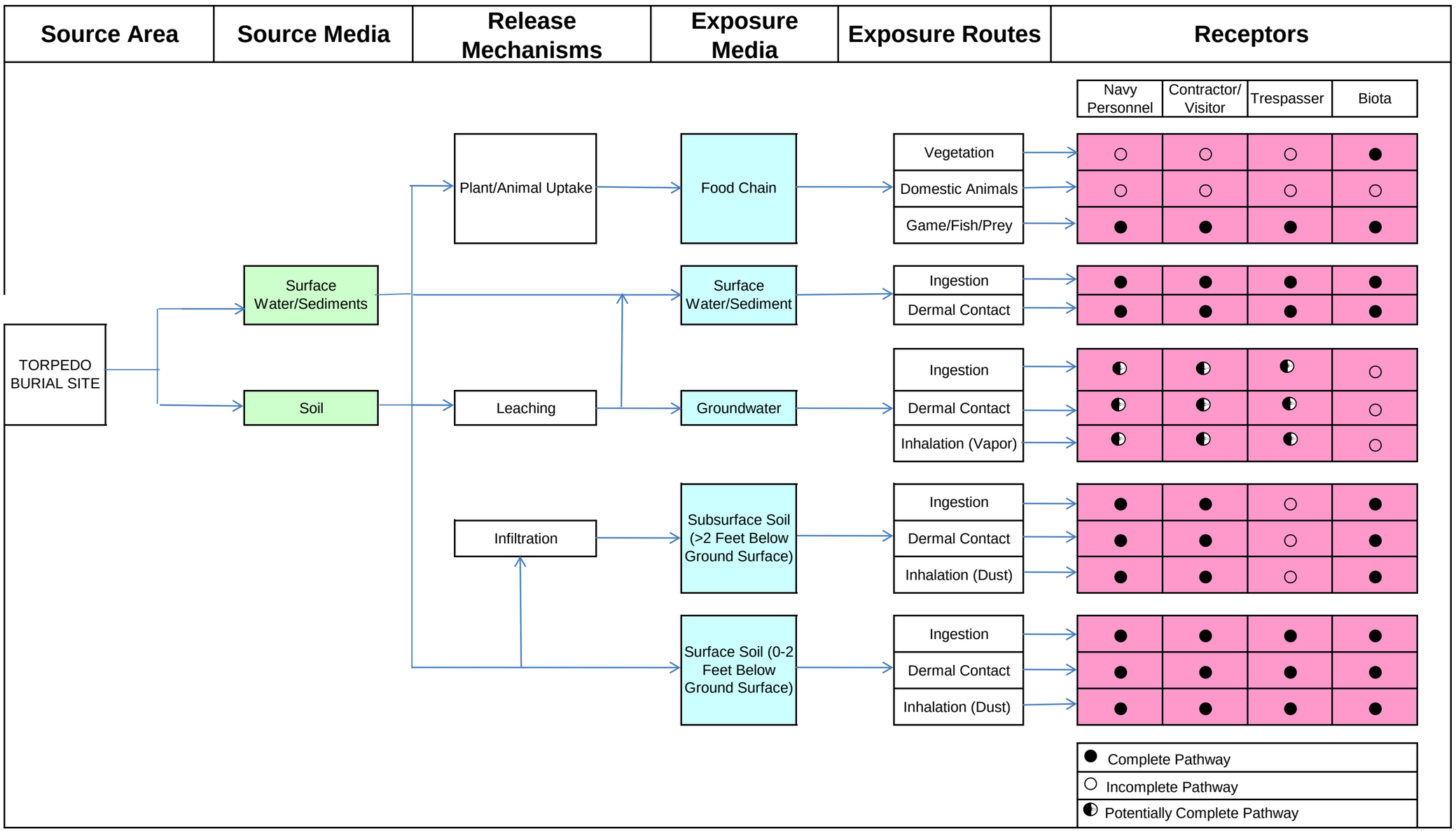


9-6B

MC EXPOSURE PATHWAY ANALYSIS

TORPEDO BURIAL SITE UXO 12

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



10.0 TEST AREA 1 – UXO-21

10.1 LOCATION AND SETTING

Test Area 1, which comprises approximately 4.5 acres, is located near the center of the Stump Neck Annex peninsula. This area was used in the 1950s for the construction of a 220-foot by 263-foot "hole-in the-ground" antenna at the range and was used in early pioneer moon relay communication experiments. The antenna portion of Test Area 1 is now wooded and overgrown with hardwood forest vegetation.

10.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

Buildings 2191 and 2192, which are used for equipment storage, are located within the boundaries of Test Area 1. A storage building and several other small structures which are currently used for robotics training, and two towers which were formerly used in operating the antenna are also at Test Area 1. Building 2172 is located approximately 150 meters east of Test Area 1. A potable water line is located in the eastern portion of Test Area 1. Electrical power lines, which were installed in 1995, also run to Test Area 1. The majority of Test Area 1 to the south of the robotics training structures is occupied by a former moon relay communication antenna which is a reflector formed by a parabolically shaped depression in the ground, with lip-to-lip dimensions of 220 feet by 263 feet, coupled with a collector suspended above the reflector by a boom. The anticipated and potential future activities at the range/site include continued training and operations, and construction, maintenance, and operations related to any future development.

TA1-3. Current Structures at Test Area 1 Used in the Robotics Testing

10.3 TOPOGRAPHY

The antenna located at Test Area 1 is located within a man-made depression. The outer rim of the antenna is at a higher elevation (approximately 125 feet above msl) than the surrounding area and was likely built up with soil excavated during the antenna construction. The southern side of Test Area 1 is naturally at higher elevations than the northern side of the site.

TA1-1. Antenna Dish Partially Overgrown by Vegetation

10.4 GEOLOGY

Site-specific geology was classified for Test Area 1 during this SI's shallow surface boring investigation. Soils for the 0 to 2 feet bgs interval were designated as a mixture of very fine sand, silt, and clay, with some pebbles. No waste material was encountered during the shallow surface investigation. The soil sample collected in the bowl area of Test Area 1, X021SB021 was collected in a hole remaining from a former tree. The soil type was similar to that of the soil on the outside of the bowl, and was classified as very fine sandy silt with pebbles. Soil and sediment log sheets are included in Appendix F.8.

10.5 SOIL AND VEGETATION

According to the Soil Survey of Charles County, the predominant soil type associated with Test Area 1 is moderately eroded, Beltsville silt loam with 2 to 5 percent slopes (USDA, 1974). Test Area 1 is located within a hardwood forest area.

10.6 HYDROLOGY

Test Area 1 is located near the center of the Stump Neck peninsula. The closest water body is Mattawoman Creek, approximately 2,000 feet to the north. Surface water runoff likely follows topography at Test Area 1; however, because Test Area 1 is on a local topographic high, it is not known in which direction surface water would flow. There are no wetlands at Test Area 1.

10.7 HYDROGEOLOGY

It is assumed that shallow groundwater flow from Test Area 1 follows topography and is connected to the area's dominant surface water bodies (Mattawoman Creek and the Potomac River). However, because Test Area 1 is on a local topographic high, it is not known in which direction groundwater would flow.

10.8 WETLANDS

There are no wetlands at Test Area 1.

10.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

According to the 1996 Phase I Cultural Resources Survey of Stump Neck Annex, there are no archeological/cultural sites within Test Area 1. Several shovel test pits were excavated on the site, and all were negative for artifacts.

10.10 HISTORICAL INFORMATION

Test Area 1 is an approximately 4.5-acre wooded site. In the 1950s the Naval Research Laboratory constructed a 220-foot by 263-foot "hole-in-the-ground" antenna (the bowl) to support moon relay communication experiments. During the 1960s and 1970s, Test Area 1 was used for AA&D training (such as booby traps and trip wires). In the 1980s, Test Area 1 was used for IED and IND training. All training items were inert; however, the devices were connected to small charges (a quarter-pound block of TNT) located a short distance from the training item. The charges were sized for total consumption, although small amounts of residue may remain. During the 1990s, Test Area 1 was used primarily for robotics testing. The buildings at the site continue to be used for robotics training. Based on historical use of Test Area 1 for AA&D, IED and IND training, all of the area is suspect for MEC.

10.11 MUNITIONS USED

This section describes the munitions and munitions-related materials known or suspected to be at Test Area 1, including the types and estimated maximum penetration depths. This includes both MEC and non-hazardous munitions-related debris (e.g., fragmentation, base plates, inert mortar fins). Potential ordnance concentration areas are presented along with a discussion on the presence of any special consideration ordnance. Interviews with range personnel regarding Test Area 1 provided information that TNT was used at the range. Test Area 1 was formerly used for AA&D, IED, and IND training. All training items were inert; however, the devices were connected to working components that would set off a small charge (a quarter-pound block of TNT) located a short distance from the training item. The exact locations of these small charges are not known. The charges were sized for total consumption; however, it is possible that small amounts of residue may remain. Based on the information obtained during the data collection process, Test Area 1 is not suspected to contain CWM-filled munitions, electrically-fuzed munitions, or DU-associated munitions.

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 10-1. There is no evidence of munitions or ordnance at the site. Small (quarter-pound) charges of TNT were used in conjunction with inert AA&D and IED activities at Test Area 1 from the 1960s to 1980s. Students worked with inert items connected to TNT charges at a safe distance from the training item locations.

10.12 MUNITIONS CONSTITUENTS

Based on the documented use of small TNT charges with inert item student training activities at Test Area 1, TNT and TNT breakdown products (2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, and p-dinitrobenzene) are considered the most likely MC in surface soil.

10.13 MEC SITE FIELDWORK

10.13.1 Background

The structure of the antenna (nicknamed the bowl) at Test Area 1 would interfere with detector-aided UXO and geophysical surveying; therefore, a UXO visual survey over 100 percent of the inside of the bowl was conducted. Outside of the bowl area, a 100-percent UXO detector-aided surface sweep was conducted on the accessible portions of the remainder of the site boundary determined during the PA. The inert training items are the focus of the detector-aided surface sweeps and geophysical surveys,

not the small charges, because the MEC explosive shots (or small charges) themselves were not expected to have physical properties that would allow them to be detected by the UXO sweep or geophysical survey.

The initial horizontal boundary for the MEC investigation was the MRP boundary identified on Figure 10-1.

The initial vertical boundary for the MEC investigation (detector-aided surface sweeps) was 1 foot bgs. Small TNT charges were used during training at this site, but were not expected to have penetrated the ground surface.

10.13.2 Scope

The scope of survey activities at Test Area 1 is summarized below (see Figure 10-1).

- Brush cutting as necessary to support the detector-aided surface sweeps.
- UXO visual surveying (100-percent coverage) of the inside of the bowl.
- UXO detector-aided surface sweeping (100-percent coverage) on the accessible portions of the remainder of the site according to the PA (4.52 acres).
- Consulting with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate MC UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH IR Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items left in place were avoided during subsequent surveying. No MEC items were moved or disturbed during this phase of the project. All other metal scrap were removed from the area of concern and consolidated.

10.13.3 Site Preparation

Brush cutting and vegetation removal to support the detector-aided surface sweep were conducted to the degree necessary to allow the metal detector to get within a few inches of the ground surface. The magnetic detector is approximately 1 inch in diameter and is durable; therefore, it is possible to push the detector through brush and vegetation, and as a result, less brush cutting and vegetation removal is

required. The all-metals detector has a detection head of approximately 8 inches and is more fragile than the magnetometer. Therefore, brush and vegetation were cleared to within a few inches of the ground surface.

10.13.4 UXO Detector-Aided Surface Survey

The UXO team established a coordinate system for the visual survey sweep and detector-aided surface sweep by creating a labeled system of survey stakes. The UXO team established 5-foot lanes to survey the established survey areas with 100-percent coverage.

Visual Survey (Inside the Bowl)

A thorough visual inspection of the metal-reinforced bowl area was conducted for the presence of suspect MEC. A visual inspection of the antenna bowl was performed, because a geophysics sweep of the bowl was not possible because of iron mesh reinforcement in asphalt materials.

Detector-Aided Surface Sweep (Outside the Bowl)

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix E.

A 100 percent detector-aided surface survey was conducted outside the bowl area as shown on Figure 10-1. The survey was conducted by UXO technicians using hand-held metal detectors (Schonstedt or White's). The detector-aided surface sweeps were initially conducted using a magnetic locator (magnetic gradiometer) Schonstedt GA-52Cx. During the surface sweep, if visual observations or other information showed that non-ferrous metals from suspect MEC may be present, then an all-metals detector such as the White's Spectrum XLT or equivalent was used. The all-metals detector was either used in place of, or in conjunction with, the magnetic locator. The decision as to whether one or both detectors was used was based on the ability to place the sensor of the all-metals detector within 1 foot of the ground surface, the relative proportion of ferrous MEC items to non-ferrous MEC items, and the types of items visually observed and their relative potential to be MEC or MPPEH.

The general UXO detector aided survey was conducted as described in Section 3a.3. Locations where visual observations of suspect MEC, MPPEH, MD or subsurface anomalies were observed were marked with a stake. Pictures were taken of items observed on the surface. In clear areas, the locations were recorded using a GPS. In areas where tree canopy precluded use of a GPS, locations were established

using a tape measure and compass measurements from a known location(s). All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures. The MEC hazard assessment methodology is described in Section 3a.5. MEC documentation is described in Section 3a.7.

10.14 DEVIATIONS FROM WORK PLAN

There were no deviations from the work plan.

10.15 MEC SURVEY RESULTS

The Field Forms are included in Appendix C. The UXO Surface Survey Activities are summarized below from the daily and weekly logs at the Test Area 1.

On January 27, 2010, the UXO Team relocated to Test Area 1 and cut brush.

10.15.1 UXO Detector-Aided Surface Survey Results

On February 2 and 3, 2010, the UXO Team swept Test Area 1 with Schonstedts GA-52Cx and White's XLT. Twelve MD items were located at five locations.

The majority of the items were found at the southeastern corner of the site, which appears to have been the site of some explosive training activities. Figure 10-2 illustrates the Test Area 1 MD Finds Locations and Table 10-2 details the MD finds. Appendix D presents photographs of the MD items discovered during the detector-aided surface sweeps. an MD item is shown below.

10.15.2 Visual Survey (Inside the Bowl) Results

The UXO Team completed a limited visual survey of the bowl due to snow cover as a result of the snow storm on February 4, 2010. A complete visual survey will be completed during the RI.

10.16 MC SAMPLING PROGRAM

Information from the detector-aided surface sweep and visual survey, about the presence of MD and shallow subsurface anomalies, was utilized to identify surface MC soil sampling locations, and to determine if contamination exists. Tetra Tech consulted with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate UFP SAP). A total of 41 soil samples were collected at 21 locations at Test Area 1. Table 10-3 lists the sampling locations and the justification for selecting the locations.

If no suspect MEC, MPPEH, or subsurface anomaly clusters were observed, the samples were collected at the UFP SAP proposed locations. Figure 10-3 illustrates the sampling locations in conjunction with the MEC detector-aided surface sweep findings at Test Area 1. All soil samples were collected via hand

auger and submitted to the fixed-base laboratory for explosives analysis. Three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis.

The CSM (detailed in Appendix B of Volume I of the UFP SAP) indicated that potentially complete exposure pathways existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist. The updated CSM is included in Section 10.22.

10.16.1 MC Sample Collection and Analysis

Soil sample locations were selected based on a bias towards areas that were believed to be most likely contaminated by past operations at the site. The total area of the site is 4.52 acres as indicated in Table ES-1. See Figure 10-3 for all sample locations. Prior to initiating sample collection, all sample locations were marked by colored pin flags bearing the sample location ID number. Collected sample locations identified in the approved UFP SAP were located by GPS and by measurements from stationary objects (e.g., roadways, existing buildings).

Surface Soil

a) Forty-one composite surface soil samples were collected at the 0- to 6-inch bgs and 0 to 24-inch bgs levels at 21 sample locations. One composite surface soil sample was collected within the “bowl” of the Test Area. The remaining forty composite surface soil samples were collected outside the bowl area. The 0- to 6-inch bgs interval is of interest for ecological risk screening while the 0- to 24-inch bgs interval is of interest for the human health risk screening.

   Each composite sample was composed of seven discrete samples collected in a “wagon-wheel” pattern with the length of the radials being approximately 10 feet. Explosives present on the surface would have resulted from low order detonations releasing particles of explosives. These particles would be heterogeneously distributed in surface soil. In order to form a composite in which explosives would be evenly dispersed, the entire composite was processed in the laboratory using SW 846 Method 8330B, as described in Appendix A of the UFP SAP. This methodology consists of air drying and sieving the entire sample and conducting particle size reduction (grinding) of the entire sample.

   One soil sample shipped to the laboratory was analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

Anomaly avoidance techniques were followed for collection of all soil samples. Soil sample log sheets are included in Appendix F of this document.

10.17 WORK PLAN DEVIATIONS

There were no deviations from the work plan.

10.18 SITE INSPECTION DATA COLLECTION RESULTS

10.18.1 MC Sampling Results

All soil samples were compared to the PALs and background sampling results, and a statistical evaluation was done to compare the background data with the site sampling results. The summary tables of the site background screening and PALs are presented in Appendix H and the MC analytical results are also presented in Appendix H. The data validation reports are presented in Appendix I. The statistical summary and calculations are presented in Appendix J. Table 10-4 summarizes the results as compared to the calculated screening values for explosives in surface soil. The PAL was the reference limit, unless the background and screening calculations exceeded this value. In Table 10-4, if a parameter had an exceedance at any sampling point, the parameter is highlighted; individual sample exceedances are also highlighted.

10.19 DATA QUALITY REVIEW/USABILITY

10.19.1 Data Quality Review of Samples at Test Area 1

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for Test Area 1 were of acceptable quality for use in decision-making. The review began with data validation, which is a comparison of DQIs against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as “U,” “J,” “R,” “L,” “K,” or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the DQOs of the project. The DQOs presented in the Munitions Response Program Site Inspections at Ten Munitions Response Program Ranges QAPP (September 2009) were maintained through the course of the sampling event. The Worksheets #19 and #15 of the QAPP present the analytical methods and compounds analyzed.

Table 7 in Appendix I presents all the qualified data and the reason for the data qualification. The rejection of data was not necessary for samples collected at the Test Area 1 and all data are considered valid for their intended purpose.

10.20 DATA COMPARISON TO PROJECT ACTION LIMITS

Forty-one composite surface (0- to 6-inch and 0- to 24-inch bgs) soil samples were sent to the FBL for explosives analyses using SW 846 Method 8330B.

10.20.1 Surface Soil

Table 10-4 summarizes the results as compared to the calculated screening values for explosives in surface soil. No explosives were detected in the composite surface soil samples.

No Human Health Risk Screening, Ecological Screening, or statistical calculations were performed since there were no exceedances of the PALs for any Explosive parameter.

10.20.2 CEC, pH, and TOC

Three soil samples were shipped to the FBL for CEC, pH, and TOC analyses. CEC was detected at 42.7 mEq/100 at X21SS0070024, 62.3 mEq/100 at X21SS0090024, and 74 mEq/100 at X21SS0100006. pH was detected at 4.73 S.U. at X21SS0070024, 4.91 S.U. at X21SS0090024, and 5.16 S.U. at X21SS0100006. TOC was detected at 2470 mg/kg at X21SS0070024, 4860 mg/kg at X21SS0090024 and 9460 mg/kg at X21SS0100006. There are no PALs for CEC or pH. The surface background TOC is 57,200 mg/kg and the subsurface background TOC is 66,500 mg/kg. TOC is a measure of the total amount of nonvolatile, volatile, partially volatile, and particulate organic compounds in a sample. The TOC background values were not exceeded. The mobility of metals is influenced by pH and CEC. CEC is a calculated value that is an estimate of the ability of the soil to attract, retain, and exchange cations. Soils with CEC above 10 mEq have a higher clay content and a lower sand content with many positions to hold cations. In general, metal cations are most mobile under acidic conditions, and a pH of 7 is neutral. The pH level in this sample would be considered acidic. The mobility of metals generally increases with decreasing soil pH and CEC.

10.21 UPDATED CSM

Only MC associated with the Test Area 1 are considered in the CSM exposure pathway analysis. This general description of the CSM exposure pathway analysis was included in Section 10.7.11 of the SAP as follows: "At Test Area 1, historical evidence indicates that MEC may be present. Potentially complete pathways exist for human and ecological receptors for MEC in surface soil. This includes receptors for hand/tread underfoot contact and surface intrusive work that may be conducted at Test Area 1. These activities include, but are not limited to, excavation, plowing, tilling, construction, and environmental sampling for human receptors. Ecological receptors may come in contact with MEC through burrowing, nesting, or feeding activities that disturb surface soil. Trespassers are anticipated to be exposed via non-intrusive surface soil activities at the range, but it is unlikely they would be exposed to subsurface soil through intrusive activities. MEC are not expected in the subsurface. Residual TNT and breakdown constituents may be present in soil as a result of IED and IND training conducted at Test Area 1 in the 1980s." Figure 10-4 is a three-dimensional depiction of the CSM for Test Area 1 and details the potential exposure sources. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil, soil, and sediment. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses.

No chemicals were retained as COPCs. Therefore, neither a Human Health Risk Exposure Summary nor an Ecological Risk Exposure Summary were performed.

10.22 EXPOSURE PATHWAY ANALYSIS

Figure 10-5A graphically presents an Exposure Pathway Analysis for MEC. Twelve MD items were logged during the MEC surface survey. The exposure sources appear to be limited. One pathway is runoff from precipitation. Leaching from soil into groundwater has been eliminated as a pathway, since groundwater is not used at the site. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses.

The Exposure Pathway Analysis for MC (Figure 10-5B) illustrates incomplete exposure pathways. There were no detections of explosives in surface samples collected during the MC investigation. Soil represents the primary potential source medium. All human and ecological receptors resulted in incomplete exposure pathways for direct contact with MC in surface soil, which includes dermal contact, ingestion, and inhalation (dust).

10.23 CONCLUSIONS

MEC

Twelve MD items were located at five locations. The majority of the items were found at the southeastern corner of the site, which appears to have been the site of some explosive training activities. A subsurface geophysical survey was not performed.

The CSM and subsequent Exposure Pathway Analyses indicate that potentially complete exposure pathways for MEC and incomplete exposure pathways for MC exist for both human and ecological receptors under both current and hypothetical future land uses. Potential human and ecological risks have been characterized for receptors exposed to MEC. Unacceptable levels of human and/or ecological risk may exist.

MC

Explosive analyses for soil samples collected in this SI did not result in any detections of explosive parameters. Therefore, based on sampling results from this SI, there are no MC present at Test Area 1.

10.24 RECOMMENDATIONS FOR NEXT PHASE

Proceed to an RI. The RI should include:

- Clearance of surface munitions debris in the area surrounding the outside of the “bowl.”
- Subsurface geophysical investigation.
- Investigation of representative subset of subsurface anomaly discovered during the geophysical investigation.

TABLE 10-1

MUNITION TYPES AND CHEMICALS
TEST AREA 1 - UXO 21
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MUNITIONS TYPES USED/STORED AT THE FACILITY	ASSOCIATED CHEMICAL CONSTITUENTS
Inert items connected to TNT charges	TNT (2,4,6-trinitrotoluene)
	TNT breakdown products (2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, and p-dinitrobenzene)

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 10-2

TEST AREA 1
MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

FACILITY	Stump Neck Annex of Indian Head MD
SITE NUMBER & NAME	112G00810 MMRP Site Investigation

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition (indicate w/			Notifications Completed (indicate w/ √ as applicable)	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
02/02/2010	1418	Test Area 1	Test Area 1-01			X	321112.69	1253524.95	MK-20 dispenser	Staged, empty			02/02/2010	X	Test Area 1-01
02/03/2010	1508	Test Area 1	Test Area 1-02			X	320806.92	1253620.21	3ea Mk 71 Rocket motors	Staged, empty			02/03/2010	X	Test Area 1-02
02/03/2010	1513	Test Area 1	Test Area 1-03			X	320772.89	1253604.50	4ea Mk 71 Rocket motors	Staged, empty			02/03/2010	X	Test Area 1-03
02/03/2010	1515	Test Area 1	Test Area 1-04			X	320772.74	1253619.03	3ea Mk 71 Rocket motors	Staged, empty			02/03/2010	X	Test Area 1-04
02/03/2010	1517	Test Area 1	Test Area 1-05			X	320770.57	1253604.75	Mk 71 Rocket motor	Staged, empty			02/03/2010	X	Test Area 1-05

TABLE 10-3

MC SAMPLING PROGRAM
TEST AREA 1 - UXO 21
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Sampling Locations	Justification
X21SB001	Check Sampling
X21SB002	Check Sampling
X21SB003	Check Sampling
X21SB004	Check Sampling
X21SB005	Check Sampling
X21SB006	Check Sampling
X21SB007	Check Sampling
X21SB008	Check Sampling
X21SB009	Check Sampling
X21SB010	Check Sampling
X21SB011	Check Sampling
X21SB012	Check Sampling
X21SB013	Check Sampling
X21SB014	Check Sampling
X21SB015	Check Sampling
X21SB016	Check Sampling
X21SB017	Check Sampling
X21SB018	Check Sampling
X21SB019	Check Sampling
X21SB020	Check Sampling

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss00100		x21ss00101		x21ss00200		x21ss00202		x21ss00300		x21ss00302		x21ss00400		x21ss00402		x21ss00500	
	rsample			X21SS0010006		X21SS0010024		X21SS0020006		X21SS0020024		X21SS0030006		X21SS0030024		X21SS0040006		X21SS0040024		X21SS0050006	
	location			X21SB001		X21SB001		X21SB002		X21SB002		X21SB003		X21SB003		X21SB004		X21SB004		X21SB005	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X21SS0010006		X21SS0010024		X21SS0020006		X21SS0020024		X21SS0030006		X21SS0030024		X21SS0040006		X21SS0040024		X21SS0050006	
	gis_date			20100311		20100311		20100311		20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			001		003		005		007		009		011		013		015		017	
cas	x	utl95cv	minorpal	c_001		c_003		c_005		c_007		c_009		c_011		c_013		c_015		c_017	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss00502		x21ss00600		x21ss00602		x21ss00700		x21ss00702		x21ss00800		x21ss00802	
	nsample			X21SS0050024		X21SS0060006		X21SS0060024		X21SS0070006		X21SS0070024		X21SS0080006		X21SS0080024	
	location			X21SB005		X21SB006		X21SB006		X21SB007		X21SB007		X21SB008		X21SB008	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X21SS0050024		X21SS0060006		X21SS0060024		X21SS0070006		X21SS0070024		X21SS0080006		X21SS0080024	
	gis_date			20100311		20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate																
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS	
	z			019		021		023		025		027		029		031	
cas	x	utl95cv	minorpal	c_019		c_021		c_023		c_025		c_027		c_029		c_031	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.19	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U
	Miscellaneous Parameters																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA									42.7					
TTNUS288	PERCENT MOISTURE (%)	NA	NA									17.7					
TTNUS002	PH (S.U.)	8.8	NA									4.73					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA									2470					
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA									82.3					

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss00900		x21ss00902		x21ss01000		x21ss01002		x21ss01100		x21ss01102		x21ss01200	
	nsample			X21SS0090006		X21SS0090024		X21SS0100006		X21SS0100024		X21SS0110006		X21SS0110024		X21SS0120006	
	location			X21SB009		X21SB009		X21SB010		X21SB010		X21SB011		X21SB011		X21SB012	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X21SS0090006		X21SS0090024		X21SS0100006		X21SS0100024		X21SS0110006		X21SS0110024		X21SS0120006	
	gis_date			20100311		20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate																
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS	
	z			033		035		037		039		041		043		045	
cas	x	utl95cv	minorpal	c_033		c_035		c_037		c_039		c_041		c_043		c_045	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.24	U	0.25	U	0.24	U	0.25	U	0.24	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.25	U	0.24	U	0.25	U	0.24	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA			62.3		74									
TTNUS288	PERCENT MOISTURE (%)	NA	NA			18.5		22.8									
TTNUS002	PH (S.U.)	8.8	NA			4.91		5.16									
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA			4860		9460	J								
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA			**81.5**		77.2									

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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	parameter			x21ss01202		x21ss01300		x21ss01302		x21ss01400		x21ss01402		x21ss01404		x21ss01406	
	nsample			X21SS0120024		X21SS0130006		X21SS0130024		X21SS0140006		X21SS0140006-AVG		X21SS0140006-D		X21SS0140024	
	location			X21SB012		X21SB013		X21SB013		X21SB014		X21SB014		X21SB014		X21SB014	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X21SS0120024		X21SS0130006		X21SS0130024		X21SS0140006		X21SS0140006-AVG		FD031110-02		X21SS0140024	
	gis_date			20100311		20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		NM		NM		FD		NM	
	sacode			NORMAL		NORMAL		NORMAL		DUP		AVG		DUP		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate													X21SS0140006			
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00		0.50		0.50		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS	
	z			047		049		051		053		054		056		059	
cas	x	utl95cv	minorpal	c_047		c_049		c_051		c_053		c_054		c_056		c_059	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.19	U	0.2	U	0.20	U	0.2	U	0.2	U
	Miscellaneous Parameters																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA														
TTNUS288	PERCENT MOISTURE (%)	NA	NA														
TTNUS002	PH (S.U.)	8.8	NA														
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA														
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA														

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss01500		x21ss01502		x21ss01600		x21ss01602		x21ss01700		x21ss01702	
	nsample			X21SS0150006		X21SS0150024		X21SS0160006		X21SS0160024		X21SS0170006		X21SS0170024	
	location			X21SB015		X21SB015		X21SB016		X21SB016		X21SB017		X21SB017	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010060		00810_2010060	
	sample_coc			X21SS0150006		X21SS0150024		X21SS0160006		X21SS0160024		X21SS0170006		X21SS0170024	
	gis_date			20100311		20100311		20100311		20100311		20100312		20100312	
	qc_type			NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO	
	duplicate														
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS	
	z			061		063		065		067		069		071	
cas	x	utl95cv	minorpal	c_061		c_063		c_065		c_067		c_069		c_071	
	Explosives (mg/kg)														
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.19	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters														
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA												
TTNUS288	PERCENT MOISTURE (%)	NA	NA												
TTNUS002	PH (S.U.)	8.8	NA												
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA												
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA												

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss01800		x21ss01802		x21ss01804		x21ss01806		x21ss01900		x21ss01902		x21ss02000		x21ss02002		x21ss02100	
	nsample			X21SS0180006		X21SS0180024		X21SS0180024-AVG		X21SS0180024-D		X21SS0190006		X21SS0190024		X21SS0200006		X21SS0200024		X21SS0210006	
	location			X21SB018		X21SB018		X21SB018		X21SB018		X21SB019		X21SB019		X21SB020		X21SB020		X21SB021	
	project_no			00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060	
	sample_coc			X21SS0180006		X21SS0180024		X21SS0180024-AVG		FD031210-01		X21SS0190006		X21SS0190024		X21SS0200006		X21SS0200024		X21SS0210006	
	gis_date			20100312		20100312		20100312		20100312		20100312		20100312		20100312		20100312		20100312	
	qc_type			NM		NM		NM		FD		NM		NM		NM		NM		NM	
	sacode			NORMAL		DUP		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate									X21SS0180024											
	top_depth				0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	bottom_dep				0.50		2.00		2.00		2.00		0.50		2.00		0.50		2.00		0.50
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			073		075		076		078		081		083		085		087		089	
cas	x	utl95cv	minorpal	c_073		c_075		c_076		c_078		c_081		c_083		c_085		c_087		c_089	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																		

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD\SN_TEST_AREA1_MEC.MXD 5/28/10 KM

DRAWN BY K. MOORE	DATE 8/24/07	TEST AREA 1 (UXO-21) MEC INVESTIGATION LOCATION NAVAL SUPPORT FACILITY INDIAN HEAD STUMP NECK ANNEX INDIAN HEAD, MARYLAND	CONTRACT NUMBER N62467-04-D-0055
CHECKED BY E. BERKLITE	DATE 5/28/10		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			FIGURE NO. FIGURE 10-1 REV 0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD\SN_TEST_AREA1_MEC_FINDS.MXD 4/16/10 KM

1253000 1253500 1254000

321000

320500

N

good condition on surface

BOWL

100% Visual Survey inside of Bowl

Roach Road

Rocket Shipping Cases

3 mk 71 rocket motor tube

4 mk 71 rocket motor tube

2 mk 71 rocket motor tube

1 mk 71 rocket motor tube

100 105 110 115 120 125 130

Legend

- MRP Object
- Landmark
- UXO Detector-aided Sweep & Geophysical Survey
- MRP Area Boundary Identified during PA
- Surface Drainage
- Topographic Contour (5-ft)

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

100 50 0 100 Feet

DRAWN BY K. MOORE	DATE 8/24/07
CHECKED BY E. BERKLITE	DATE 3/29/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

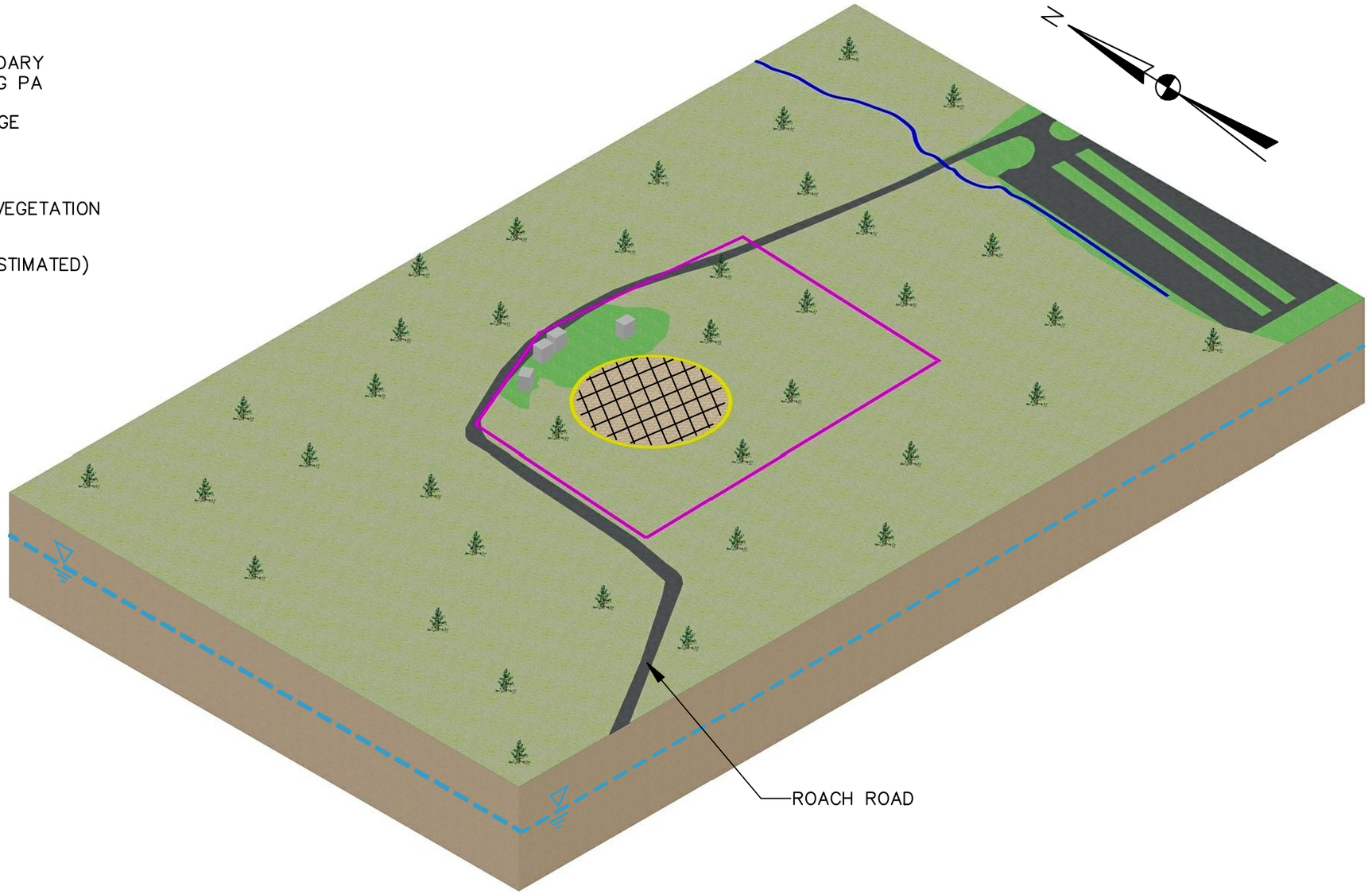
TEST AREA 1 (UXO-21)
MEC FINDS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055	
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 10-2	REV 0

P:\GIS\INDIANHEAD_NSWC_NEW\MXD\SN_TEST_AREA1_SAMPLING.MXD 7/9/10 KM

LEGEND

- MRP AREA BOUNDARY IDENTIFIED DURING PA
- SURFACE DRAINAGE
- BOWL
- OVERGROWN BY VEGETATION
- WATER TABLE (ESTIMATED)
- BUILDINGS
- TREE
- GRASS
- PAVED ROAD
- FOREST
- SOIL



DRAWN BY ND DATE 6-15-10	NAVFAC	TEST AREA 1 UXO-21 CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND	CONTRACT NO. 0810
CHECKED BY DATE			OWNER NO.
REVISED BY DATE			APPROVED BY DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 10-4 / REV. 0

R:\0810\CSM\0810CSM012.dwg PIT NICHOLE.DILLA 6/24/2010 7:37:30 AM

FIGURE 10-5A

MEC EXPOSURE PATHWAY ANALYSIS

TEST AREA 1 UXO 21

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

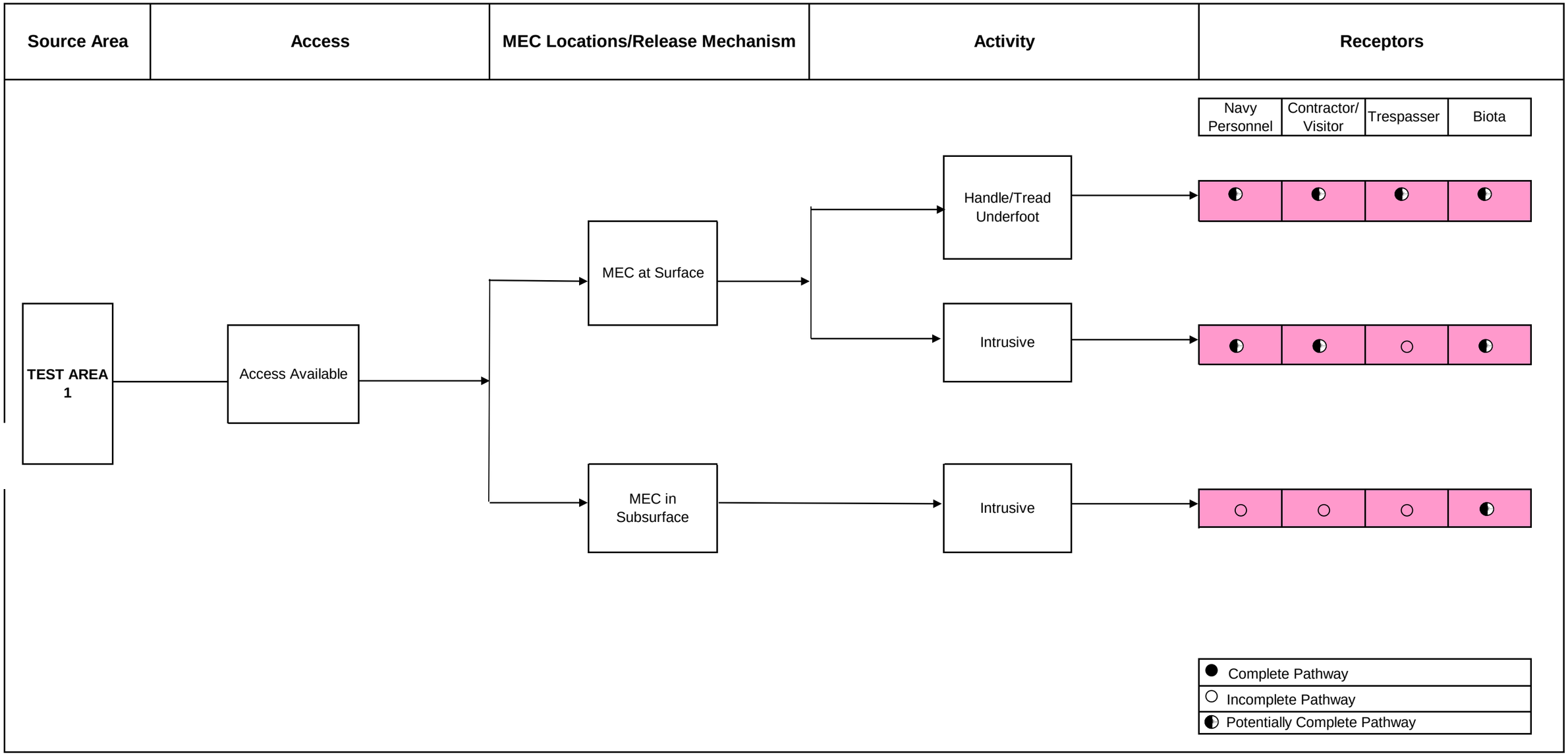
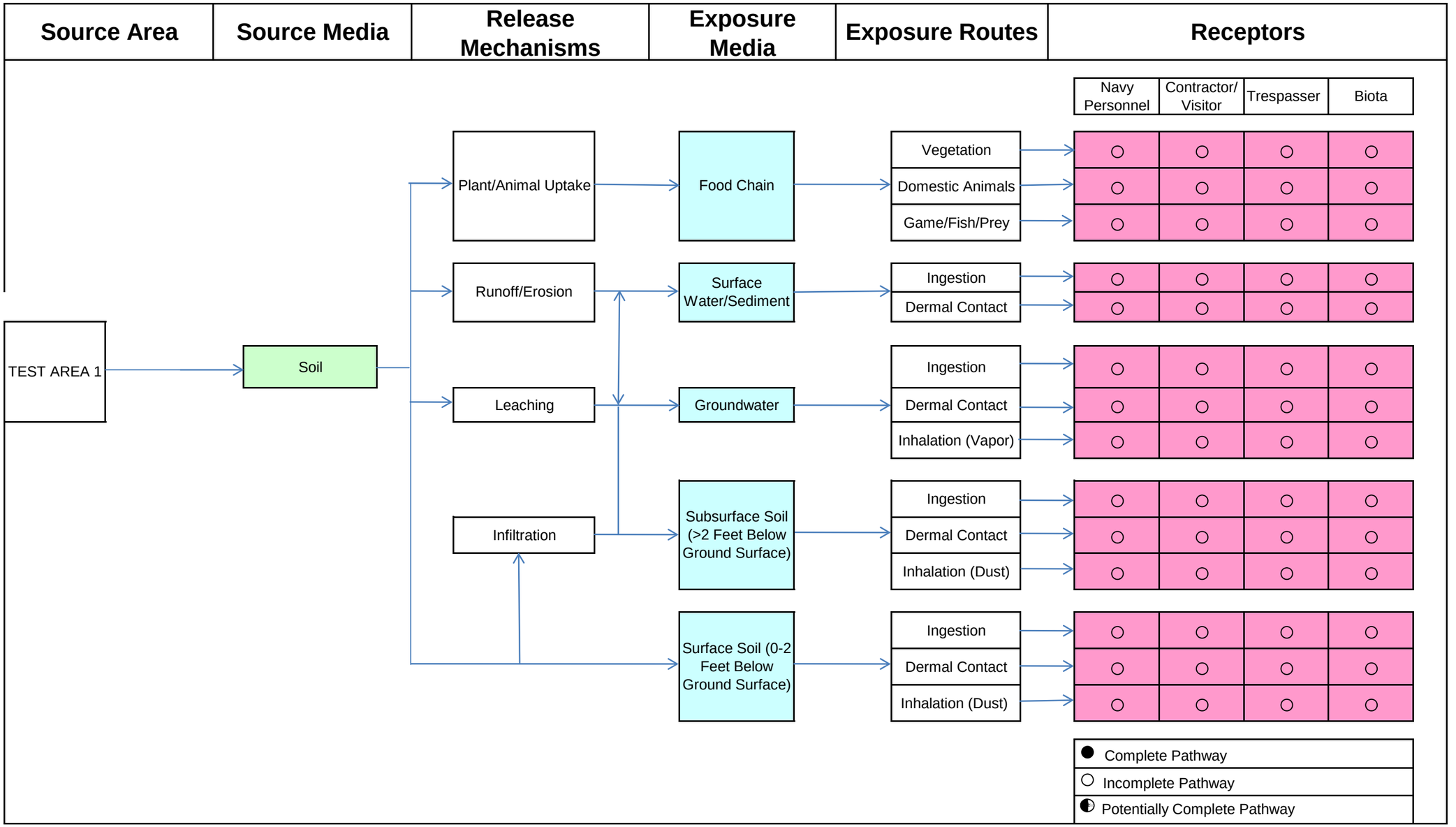


FIGURE 10-5B

MC EXPOSURE PATHWAY ANALYSIS

TEST AREA 1 UXO 21

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



11.0 TORPEDO CASING DISPOSAL SITE – UXO-23

11.1 LOCATION AND SETTING

The Torpedo Casing Disposal Area encompasses approximately 0.7 acres and is located approximately 200 feet north of Archer Avenue and is partially within a designated wildlife area. The wildlife area is a cleared strip of land approximately 20 feet wide extending north from Archer Avenue to the Potomac River. The disposal site overlies the western edge of the cleared area and extends into the bordering tree line. The site is rectangular in shape and approximately 165 feet wide and 330 feet long. The area was identified through the Navy Range Inventory; however, its location was initially described incorrectly. Initial maps showed the area positioned under the water tower adjacent to Archer Avenue, east of the corrected location. The approximate size and shape of the Torpedo Casing Disposal Area was provided by the inventory. There are no maps or aerial photographs that specifically identify the former disposal area. The cleared wildlife area/firebreak appears on several installation maps and photographs, the earliest one dated 1947. Information about the site was primarily gathered from interviews with Installation personnel.

11.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

There are no buildings or structures located within the Torpedo Casing Disposal Area or on the adjacent wildlife protection area. An explosives storage complex, including over a dozen buildings, is located approximately 490 feet northwest of the site. A water tower is located 720 feet southeast of the site along Archer Avenue. There was no visual evidence of any utilities on the former Torpedo Casing Disposal Area. According to a 2003 Stump Neck Utility Map, water, electric and sewer lines run along Archer Avenue, approximately 200 feet south of the area. The land was unused prior to its use as a burial site for torpedo casings during the 1950s. Currently, the land overlaps a wildlife refuge, which was used as a firebreak prior to 1981. The date of the logging and establishment of the firebreak is unknown. The protected area is not regularly maintained and is characterized by high grasses. The remainder of the site is located within a heavily forested area and is unused and not maintained. Hunting is permitted on Stump Neck, including within the Torpedo Casing Disposal Area, except for the wildlife refuge. There is no anticipated change in land use at the site.

TCD-1. The Torpedo Casing Disposal Area and Wildlife Protection Area

11.3 TOPOGRAPHY

The topography at the Torpedo Casing Disposal Area is fairly flat, but slopes slightly downward sloping from south to north. This 0.74-acre area is located at an elevation of approximately 80 feet above msl. The elevation at Archer Avenue is 95 feet and slopes to an elevation of 75 feet at the northern end of the site. Because of the heavy vegetation and gently sloping land, severe erosion is not considered to be a problem.

11.4 GEOLOGY

Site-specific geology was classified for the Torpedo Casing Disposal Area during this SI's shallow subsurface boring investigation. Soil for the 2 to 6 feet bgs interval was characterized as a sandy clay. As described in Section 2.2.3 - Regional Geology this is consistent with deposits. Overlying the Aquia Formation are fluvial-sedimentary deposits consisting of gravel, sand, and loam. These sediments are referred to as "upland deposits" and range in age from Pilocene to early Pleistocene (Hiortdahl, 1997). The upland deposits crop out at the surface in the northern portion of NSF-IH where surface elevations exceed 40 feet above msl. Groundwater was encountered at the southern end of the property in two

borings, X23SB007 and X23SB010, at the completion depth of the borings at approximately 6 feet bgs. No waste material was encountered during the shallow surface investigation. Soil log sheets are included in Appendix F.9. Boring logs are included in Appendix F.1.

11.5 SOIL AND VEGETATION

The vegetation on the former disposal area is a mix of high grasses in the open field associated with the wildlife area, and dense, hardwood forest throughout the rest of the area. The boundaries of the area overlap the eastern side of the wildlife area and extend into the hardwood forest. According to the Soil Survey of Charles County, the soil in this area is Beltsville silt loam with 2 to 5 percent slopes and moderate erodability (USDA, 1974). These soils are generally located on terrain that is nearly level to moderately sloping. They are considered moderately well drained, strongly acidic, and slowly permeable. These soils are particularly eroded around surface water bodies or areas with poor drainage where water is able to pool on the surface. The Torpedo Casing Disposal Area does not have any surface water bodies and is generally well drained. Thus, erosion of the soil on site is not considered severe.

11.6 HYDROLOGY

There are no streams within the boundaries of the Torpedo Casing Disposal Area. One small stream is south of the site across Archer Avenue. Drainage most likely follows surface topography in the direction of a small area of wetlands northeast of the wildlife area. The land slopes downward to Mattawoman Creek, which is located approximately 1,100 feet north of the site. Surface water runoff from the site drains into the wetland and Mattawoman Creek and eventually to the Potomac River.

11.7 HYDROGEOLOGY

There are no potable wells in the vicinity of the Torpedo Casing Disposal Area. There is no range-specific hydrogeology information for the Torpedo Casing Disposal Area. Groundwater most likely follows the topography, which slopes northward towards Mattawoman Creek.

11.8 WETLANDS

There are no wetlands on the site. The land slopes downward to Mattawoman Creek, which is located approximately 1,100 feet north of the site. Surface water runoff from the site drains into the wetland and Mattawoman Creek and eventually to the Potomac River.

11.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

The eastern edge of the Torpedo Casing Disposal Area overlaps a wildlife protection area. According to the 1996 Phase I Cultural Resources Survey and Supplemental Architectural Investigations conducted at Stump Neck Annex, there are no known cultural resources located within the former Torpedo Casing Disposal Area.

11.10 HISTORICAL INFORMATION

The Torpedo Casing Disposal Area consists of a rectangular-shaped parcel, measuring approximately 0.75 acres in area, within the northern portion of the Stump Neck Annex facility. Navy personnel indicate that the area was used as a disposal site for torpedo casings during the 1950s, although the exact dates of use are unknown. A portion of the Torpedo Casing Disposal Area is within a designated wildlife area, while the rest of the site is located within a heavily forested area that is unused and not maintained.

The Torpedo Casing Disposal Area is described as having been used in the 1950s to dispose of inert torpedoes, which may still remain. A previous geophysical survey of the general area suggests that magnetic anomalies greater than 3 feet deep may be indicative of large-item burial locations. The torpedo casings are presumed to be inert, although there is the potential that some explosive residue (torpex consisting principally of RDX and HMX) may remain. MEC are not suspected to be present in this area.

11.11 MUNITIONS USED

This section describes the munitions and munitions-related materials known or suspected to be at the site, including the types and estimated maximum penetration depths. This includes both MEC and nonhazardous munitions-related debris (e.g., fragmentation, base plates, inert mortar fins). Potential ordnance concentration areas are presented along with a discussion on the presence of any special consideration ordnance. Inert torpedo casings, which are not considered munitions, were reportedly buried at this site. No other information exists regarding the potential for munitions or MC in this area. Based on the information obtained during the data collection process, no CWM-filled munitions, electrically-fuzed munitions, or DU-associated munitions are known or suspected to have been used at the site.

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 11-1.

11.12 MUNITIONS CONSTITUENTS

At the Torpedo Casing Disposal Area, only empty, inert torpedo casings were reported to have been buried. The expected MC are elevated levels of metals from the weathering of the torpedo casings. Depending on the origin and use of the torpedo casings prior to burial, there is the potential for small amounts of residue on the interiors of the casings. No sampling has been performed in the area. Weathering of torpedo casings may create elevated levels of metals in soil. There may be potential MCs from residue remaining on the insides of the torpedo casings.

11.13 MEC SITE FIELDWORK

11.13.1 Background

Limited pre-survey clearing was utilized to allow geophysical data collection on 10-foot-spaced survey lines.

The Torpedo Casing Disposal Area is a 0.75-acre wooded site where, according to Navy personnel, a large cache of torpedo casings was buried. Therefore, a 100-percent UXO detector-aided sweep was conducted in accessible portions of the site. In addition, a geophysical investigation was conducted using a 10-foot survey line spacing to provide sufficient coverage for detecting possible areas of buried torpedoes within the accessible portions of the site (as identified in the PA Report). The survey depth ranged from 0 to 8 feet bgs depending on the target size.

The current site investigation at the Torpedo Casing Disposal Area was limited to detector-aided surface and subsurface geophysical investigations.

The initial horizontal boundary for the MEC investigation is defined as the suspect torpedo casing disposal area as shown in the PA and on Figure 11-1.

The initial vertical boundary for the MEC investigation (detector-aided surface sweeps and potential geophysical investigation) was 8 feet bgs within the land area. Previous geophysical investigations suggested anomalies at greater than 3 feet bgs.

11.13.2 Scope

The scope of survey activities at the Torpedo Casing Disposal Area is summarized as follows (see Figure 11-1):

- Brush and vegetation clearing was necessary to support the detector-aided surface sweeps and geophysical investigation.

- UXO detector-aided surface sweeping of the geophysical survey area.

- Geophysical surveying across accessible portions of the site using a planned 10-foot survey line spacing.

- Consulting with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate MC UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH IR Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items left in place were avoided during subsequent geophysical surveying. No MEC items were moved or disturbed during this phase of the project. Surface MD were reported on the log sheets or in the logbook for the site.

11.13.3 Site Preparation

Brush cutting and vegetation removal to support the detector-aided surface sweep were conducted to the degree necessary to allow the metal detector to get within a few inches of the ground surface. The magnetic detector is approximately 1 inch in diameter and is durable; therefore, it is possible to push the detector through brush and vegetation, and as a result, less brush cutting and vegetation removal was required. The all-metals detector has a detection head of approximately 8 inches and is more fragile than the magnetometer. Therefore, brush and vegetation were cleared to within a few inches of the ground surface.

The site is wooded, and required brush and vegetation cutting along the above mentioned transects. The transects needed to be cleared of brush smaller than 2 inches in diameter, and other vegetation was cleared to a level no greater than 12 inches above the ground surface along 3-foot-wide corridors along each transect to permit the passage of survey equipment. Trees and brush 2 inches and larger were not cut. The survey crew worked around these obstacles.

11.13.4 UXO Detector-Aided Surface Survey

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix E.

Information from detector-aided sweeps was utilized to identify potential soil sampling locations within the footprint of the surface sweeps for collection of soil samples based on the presence of MD and subsurface anomalies.

The UXO team worked with the site geophysicist to establish transects for both the detector-aided sweep and geophysical survey. Metal detectors were used to locate surface metal and debris. The 10-foot-spaced transects were established perpendicular to the established baseline using a compass or GPS unit to guide the team on a meandering path (avoiding obstacles, heavy brush, wetlands, etc.) from one end of the site to the other. The general UXO detector-aided survey was conducted as described in Section 3a.3.

11.13.5 Geophysical Surveying

A Geometrics G-858G magnetometer was used at the site because the expected targets of the site (torpedo casings) were expected to be ferrous metal objects, and the magnetometer instrument is portable in a wooded setting. The geophysicist conducted the geophysical survey along parallel survey lines spaced 10 feet apart in one trending direction providing thorough coverage for detecting large targets such as torpedo casings. Because of heavy tree canopy, GPS data measurements could not be accurately integrated with the geophysical readings; however, stationary GPS readings recorded at the starts and ends of survey lines were used to approximately position the geophysical data. Based on former site usage, it is anticipated that potential target anomalies were shallow (within 2 feet bgs) and would generate large instrument responses. Targets of the geophysical investigation included large object sizes (torpedoes) at this site; therefore, survey detection depths are expected to be several feet.

Before the geophysical survey began, the UXO team conducted a visual and detector-aided surface sweep of the survey area. No suspect MEC were found during the surface sweep.

11.14 DEVIATIONS FROM WORK PLAN

There were no deviations from the work plan.

11.15 MEC SURVEY RESULTS

The Field Forms are included in Appendix C. The UXO Surface Survey Activities are summarized below from the daily and weekly logs at the Torpedo Casing Disposal Area.

From November 30 through December 14, 2009 (non-consecutive days), all brush cutting was completed in the Torpedo Casing Disposal Area.

11.15.1 UXO Detector-Aided Surface Survey Results

The Torpedo Casing Disposal Area MEC Investigation was performed on December 14, 2009. The investigation resulted in 0 MEC and 0 MPPEH found on the surface (Table ES-2).

11.15.2 Geophysical Survey Results

Figure 11-2 displays the interpretation of the site data. The site is wooded, and accurate and reliable integrated GPS measurements were not possible; however, stationary GPS measurements were obtained at the starts and ends of survey lines, and these data were used to approximately position the geophysical data. Four anomalies were manually picked by the Project Geophysicist based on the anomaly sizes and amplitudes and professional experience are shown by "+" symbols with a number identifier, and are identified as buried ferrous metallic items. Items were picked to identify small to large object potentials in case individual small MEC items or MPPEH pieces from larger items might be unexpectedly present. Anomalies considered large enough to possibly represent caches of torpedoes or torpedo casings or other substantial metal are located at the one concentration of buried ferrous metallic items area annotated near the southeastern corner of the site. This anomaly was not fully delineated within the survey area. Another anomaly that might represent a significant buried ferrous metallic item is anomaly # 1 in the northeast region of the survey area. The nature of the buried ferrous metallic items cannot be determined from the geophysical data alone; however, given the site's potential for discarded munitions or military training equipment, it can be reasoned that there is at least the potential for buried caches of torpedoes, MEC or military training equipment.

Aboveground objects displayed in the legend as surface metals (non-munitions related) appear in a few locations to create data anomalies. The presence or absence of additional items (and potential targets) in these areas cannot be determined from the geophysical data alone.

11.16 MC SAMPLING PROGRAM

Information from the detector-aided surface sweep and geophysical survey, about the presence of MD and shallow subsurface anomalies, was utilized to identify subsurface MC soil sampling locations, and to determine if contamination exists. Tetra Tech consulted with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate UFP SAP). A total of 20 soil samples were collected at 10 locations at the Torpedo Casing Disposal Area. Table 11-2 lists the sampling locations and the justification for selecting the locations.

If no suspect MEC, MPPEH, or subsurface anomaly clusters were observed, the samples were collected at the UFP SAP proposed locations. Figure 11-3 illustrates the sampling locations in conjunction with the MEC detector-aided surface sweep and geophysical survey findings at the Torpedo Casing Disposal Area. All soil samples were collected via DPT and submitted to the fixed-base laboratory for explosives and metals analyses. Three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis.

The CSM (detailed in Appendix B of Volume I of the UFP SAP) indicated that potentially complete exposure pathways existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist. The updated CSM is included in Section 11.23.

11.16.1 MC Sample Collection and Analysis

Soil sample locations were selected based on a bias towards areas that were believed to be most likely contaminated by past operations at the site. The total area of the site is 0.74 acres as indicated in Table ES-1. See Figure 11-3 for all sample locations. Prior to initiating sample collection, all sample locations were marked by colored pin flags bearing the sample location ID number. Collected sample locations identified in the approved UFP SAP were located by GPS and by measurements from stationary objects (e.g., roadways, existing buildings).

Subsurface Soil

a) Twenty discrete subsurface soil samples were collected from 2 to 4 and 4 to 6 feet bgs at 10 soil sample locations. Two samples were collected based on visual observations of staining or other relevant indications (odors, discoloration, etc.). If these indications were not observed, samples were collected at 2 to 4 feet bgs and 4 to 6 bgs. All subsurface soil samples were analyzed for explosives (SW-846 Method 8330B) and metals (SW 846 Method 6010B/6020A).

b) Three soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

c) Subsurface soil samples were collected via DPT.

d) Anomaly avoidance techniques were followed for collection of all soil samples.

Soil sample log sheets are included in Appendix F of this document.

11.17 WORK PLAN DEVIATIONS

There were no deviations from the work plan.

11.18 SITE INSPECTION DATA COLLECTION RESULTS

11.18.1 MC Sampling Results

All soil samples were compared to the PALs and background sampling results, and a statistical evaluation was done to compare the background data with the site sampling results. The summary tables of the site background screening and PALs are presented in Appendix H and the MC analytical results are also presented in Appendix H. The data validation reports are presented in Appendix I. The statistical summary and calculations are presented in Appendix J. Table 11-3 summarizes the results as compared to the calculated screening values for explosives and metals in subsurface soil. The PAL was the reference limit, unless the background and screening calculations exceeded this value. In Table 11-3, if a parameter had an exceedance at any sampling point, the parameter is highlighted; individual sample exceedances are also highlighted. Figure 11-4 illustrates the metals exceedances in subsurface soil at the Torpedo Casing Disposal Area. Screening values used were the PAL limits for the direct contact residential values for soil.

11.19 DATA QUALITY REVIEW/USABILITY

11.19.1 Data Quality Review of Samples at Torpedo Casing Disposal Area

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for the Torpedo Casing Disposal Area were of acceptable quality for use in decision-making. The review began with data validation, which is a

comparison of DQIs against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as "U," "J," "R," "L," "K," or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the DQOs of the project. The DQOs presented in the Munitions Response Program Site Inspections at Ten Munitions Response Program Ranges QAPP (September 2009) were maintained through the course of the sampling event. The Worksheets #19 and #15 of the QAPP present the analytical methods and compounds analyzed.

Appendix I Table 8 presents all the qualified data and the reason for the data qualification. The rejection of data was not necessary for samples collected at the Torpedo Casing Disposal Area and all data are considered valid for their intended purpose.

The sample collection and laboratory analytical completeness were 100 percent.

Appendix I Table 8 shows that several results were qualified because of LCS, matrix spike, and hold time noncompliances. The noncompliances in general do not show any directional bias with the data except for the following parameters: HMX had LCS recoveries less than the laboratory quality control limit but greater than 30 percent, indicating a slight low bias. All explosive compounds for all samples, except sample X23SB0090204, were extracted 1 day outside the 14 day extraction hold time. All explosive results are considered to have a low bias, except for sample X23SB0090204. All mercury samples were analyzed 1 day outside the 28 day hold time. The two nondetected mercury results are considered to have a low bias. All other mercury results were qualified as estimated without directional bias as a result of an ICP interference. All nondetected antimony and selenium results had matrix spike recoveries less than the quality control limit but greater than 30 percent, indicating a slight low bias. Magnesium, potassium, and vanadium had matrix spike recoveries greater than the laboratory control limit. All positive results for these metals are considered to be biased high. Several copper, selenium, and strontium results were qualified as biased high as a result of an ICP interference. Overall, the laboratory accuracy was acceptable and no data were rejected. There were no quality control deficiencies noted for field accuracy.

All arsenic and aluminum results were qualified because of a field duplicate precision noncompliance. Overall, the field precision was acceptable and no data were rejected. There were no quality control deficiencies noted for laboratory precision.

No comparability issues were noted during the data validation process.

Based on field logs indicating the conditions during sample collection and laboratory audits, all reported data are adequately representative of site conditions and intended populations.

11.20 DATA COMPARISON TO PROJECT ACTION LIMITS

Twenty discrete subsurface soil samples (2 to 4 feet and 4 to 6 feet bgs) were sent to the FBL for explosives analyses using SW 846 Method 8330B and metals analyses using SW 846 Method 6010B/6020A.

11.20.1 Subsurface Soil

Table 11-3 summarizes the results as compared to the calculated screening values for explosives and metals in subsurface soil.

Explosives were not detected at any sampling location.

Four metals exceeded background and PALs in the discrete subsurface samples (aluminum, iron, lithium, and tin):

- The aluminum PAL was exceeded at one discrete subsurface soil sampling location, at an estimated concentration of 35500 mg/kg at X23SB0090204.

- The iron PAL was exceeded at one discrete subsurface soil sampling location, at a concentration of 89500 mg/kg at X23SB0010204.

- The tin PAL was exceeded at four discrete subsurface soil sampling locations: X23SB0010406 at an estimated concentration of 1.1 mg/kg, X23SB0020406 at an estimated concentration of 0.98 mg/kg, X23SB0030406 at an estimated concentration of 0.96 mg/kg, and X23SB0040406 at an estimated concentration of 1.5 mg/kg.

- The lithium PAL was exceeded in all 20 discrete subsurface soil samples, ranging from concentrations of 8.7 mg/kg at X23SB0070406 to 29.6 mg/kg at X23SB0040406.

11.20.2 CEC, pH, and TOC

Three representative soil samples per sampling depth (2 to 4 feet, 4 to 6 feet, and an additional 4 to 6 feet) were shipped to the FBL for CEC, pH, and TOC analyses. CEC was detected at 42.6 mEq/100 at X23SB0020406, 42.9 mEq/100 at X23SB0040204, and 42.2 mEq/100 at X23SB0040406. pH was detected at 4.64 S.U. at X23SB0020406, 5.3 S.U. at X23SB0040204, and 5.14 S.U. at X23SB0040406. TOC was detected at 48 mg/kg at X23SB0020406, 116 mg/kg at X23SB0040204 and 535 mg/kg at X23SB0040406. There are no PALs for CEC or pH. The surface background TOC is 57,200 mg/kg and the subsurface background TOC is 66,500 mg/kg. TOC is a measure of the total amount of nonvolatile, volatile, partially volatile, and particulate organic compounds in a sample. These TOC values were not exceeded. The mobility of metals is influenced by pH and CEC. CEC is a calculated value that is an estimate of the ability of the soil to attract, retain, and exchange cations. Soils with CEC above 10 mEq have a higher clay content and a lower sand content with many positions to hold cations. In general, metal cations are most mobile under acidic conditions, and a pH of 7 is neutral. The pH level in this sample would be considered acidic. The mobility of metals generally increases with decreasing soil pH and CEC.

An ecological risk screening was not performed, since only subsurface samples were collected (2 to 4 feet and 4 to 6 feet bgs), and ecological assessments typically focus on the 0 to 0.5 feet bgs interval.

Based on results, a limited human health risk screening evaluation was performed.

11.21 HUMAN HEALTH RISK SCREENING EVALUATION

Aluminum exceeded the PAL and 95 percent UTL value at only one location at a value 3 percent greater than the 95 percent UTL. Iron exceeded the PAL and 95 percent UTL value at only one location at a value 10 percent greater than the 95 percent UTL. The four tin exceedances only exceeded the Ecological PAL criteria. The project action limit of 16 mg/kg for lithium is based on one tenth of the residential RSL of 160 mg/kg. While concentrations of lithium at some locations exceeded the project action limit, all concentrations were less than the residential RSL. Therefore, no metals constituents were retained as COPCs.

11.22 WORK PLAN DEVIATIONS

There were no deviations from the work plan.

11.23 UPDATED CSM

A three-dimensional depiction of the Torpedo Casing Disposal Site is provided as Figure 11-5. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses. Only MC associated with the Torpedo Casing Disposal Site are considered in this CSM exposure pathway analysis. This general description of the CSM exposure pathway analysis was included in Section 10.10.11 of the UFP SAP: "Historical and visual evidence indicate that MEC are not present at the site; therefore, there are no complete exposure pathways for MEC. As such, an Exposure Pathway Analysis for MEC was not created."

11.24 EXPOSURE PATHWAY ANALYSIS

An Exposure Pathway Analysis for MEC is presented as Figure 11-6. Anomalies considered large enough to possibly represent caches of torpedoes or torpedo casings or other substantial metal are located at the one concentration of buried ferrous metallic items area annotated near the southeastern corner of the site. Another anomaly that might represent a significant buried ferrous metallic item is in the northeast region of the survey area. The nature of the buried ferrous metallic items cannot be determined from the geophysical data alone; however, given the site's potential for discarded munitions or military training equipment, it can be reasoned that there is at least the potential for buried caches of torpedoes, MEC or military training equipment to be present at the site.

Soil impacted by MC represents a primary potential source medium, as illustrated in the Exposure Pathway Analysis for MC (Figure 11-6). There are no potentially complete pathways for exposure to surface soil because the torpedo casings are buried at a depth greater than 3 feet. Potential receptors include Navy personnel and contractors who could disturb subsurface soil and excavate or remove the source medium from the site. Activities include excavation of the site for construction purposes or for possible environmental sampling. It is not anticipated that trespassers would come in contact with subsurface soil. Burrowing animals may also come into contact with buried MEC. Soil also represents an exposure medium when considering plant/animal uptake for biota (including game such as deer) and human receptors consuming the affected biota (e.g., hunting). Based on the metals detected during the MC SI investigation, the exposure pathway for subsurface soils is complete. There is a potential for the MC present in subsurface soil to infiltrate to surficial groundwater. Precipitation infiltration may provide for contaminant mobility into subsurface soil and the shallow surficial aquifer, which is assumed to be connected to nearby surface water bodies. Thus, there are potentially complete pathways to MC in surface water/sediment for all receptors.

11.25 CONCLUSIONS

- Currently, the land overlaps a wildlife refuge, which was used as a firebreak prior to 1981. The protected area is not regularly maintained and is characterized by high grasses. The remainder of the site is located within a heavily forested area and is unused and not maintained. Hunting is permitted on Stump Neck, including within the Torpedo Casing Disposal Area, except for the wildlife refuge. There is no anticipated change in land use at the site.

- The Torpedo Casing Disposal Area is described as having been used in the 1950s to dispose of inert torpedoes, which may still remain. The torpedo casings are presumed to be inert, although there is the potential that some explosive residue (torpex consisting principally of RDX and HMX) may remain. MEC are not suspected to be present in this area.

- Anomalies considered large enough to possibly represent caches of torpedoes or torpedo casings or other substantial metal are located at the one concentration of buried ferrous metallic items area annotated near the southeastern corner of the site; however, this anomaly may also be the result of a utility. Further delineation or a utility logout may determine if this anomaly is caused by a utility or warrants further investigation as a disposal area. Another anomaly that might represent a significant buried ferrous metallic item is in the northeast region of the survey area.

- Aluminum and iron exceeded the PALs at one location each and were near the 95 percent UTL value. Although lithium exceeded the PAL at all locations, all concentrations were less than the residential RSL. Therefore, no metals constituents were retained as COPCs.

- The CSM and Exposure Pathway Analyses indicate that potentially complete exposure pathways exist for MEC in the subsurface and complete exposure pathways exist for MC in the subsurface for both human and ecological receptors under both current and hypothetical future land uses. Unacceptable levels of human and/or ecological risk may exist. However groundwater is not currently used at the site.

11.26 RECOMMENDATIONS

The nature of the buried ferrous metallic items cannot be determined from the geophysical data alone; however, given the site's potential for discarded munitions or military training equipment, it can be reasoned that there is at least the potential for buried caches of torpedo casings, MEC or military training

equipment. The nature of these buried metallic items cannot be determined from the geophysical data, and can only be characterized through intrusive investigation. Based on these results, a more extensive evaluation, in the form of an RI, is recommended for UXO-23, mainly in the southeastern corner of the site. The scope of effort for the RI, which will include further characterization, delineation, and intrusive investigations, will be determined during project planning.

MEC

Proceed to an RI.

- Investigate representative subsurface anomalies to determine if these are MEC/MPPEH.

MC

- No further action is recommended, however MC sampling if subsurface MEC/MPPEH are found.

TABLE 11-1

MUNITION TYPES AND CHEMICALS
TORPEDO CASING DISPOSAL - UXO 23
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MUNITIONS TYPES USED/STORED AT THE FACILITY	ASSOCIATED CHEMICAL CONSTITUENTS
Inert torpedo casings	Metals

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 11-2

MC SAMPLING PROGRAM
TORPEDO CASING DISPOSAL - UXO 23
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Sampling Locations	Justification
X23SB001	Check Sampling
X23SB002	Geophysical Anomolies
X23SB003	Check Sampling
X23SB004	Check Sampling
X23SB005	Check Sampling
X23SB006	Check Sampling
X23SB007	Check Sampling
X23SB008	Geophysical Anomolies
X23SB009	Geophysical Anomolies
X23SB010	Geophysical Anomolies

TABLE 11-3

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO CASING DISPOSAL AREA (UXO-23)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column2		column4		column6		column8		column10		column12		column14		column16		column18	
	nsample			X23SB0010204		X23SB0010406		X23SB0020204		X23SB0020406		X23SB0030204		X23SB0030406		X23SB0040204		X23SB0040406		X23SB0050204	
	location			X23SB001		X23SB001		X23SB002		X23SB002		X23SB003		X23SB003		X23SB004		X23SB004		X23SB005	
	sample_coc			X23SB0010204		X23SB0010406		X23SB0020204		X23SB0020406		X23SB0030204		X23SB0030406		X23SB0040204		X23SB0040406		X23SB0050204	
	sample_date			20100311		20100311		20100311		20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB	
	depth_stat			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	z			001		003		005		007		009		011		013		015		017	
cas	x	utl95	minorpal	c_001		c_003		c_005		c_007		c_009		c_011		c_013		c_015		c_017	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	**3.6**	0.25	UL	0.24	UL	0.25	UL	0.24	UL	0.25	UL	0.24	UL	0.25	UL	0.25	UL	0.24	UL
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	UL	0.24	UL	0.25	UL	0.24	UL	0.25	UL	0.24	UL	0.25	UL	0.25	UL	0.24	UL
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
99-99-0	4-NITROTOLUENE	NA	30	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
2691-41-0	HMX	NA	380	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
55-63-0	NITROGLYCERIN	NA	0.61	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL
78-11-5	PETN	NA	NA	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL
121-82-4	RDX	NA	5.5	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
479-45-8	TETRYL	NA	24	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	35400	7700	15100 [PAL] [ORNL] [MDRES]	J	26400 [PAL] [ORNL] [MDRES]	J	19400 [PAL] [ORNL] [MDRES]	J	32300 [PAL] [ORNL] [MDRES]	J	27200 [PAL] [ORNL] [MDRES]	J	24300 [PAL] [ORNL] [MDRES]	J	24500 [PAL] [ORNL] [MDRES]	J	30600 [PAL] [ORNL] [MDRES]	J	25400 [PAL] [ORNL] [MDRES]	J
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.033	UL	0.033	UL	0.032	UL	0.04	J	0.032	UL	0.033	UL	0.033	UL	0.04	J
7440-38-2	ARSENIC	18.9	0.026	5 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.64 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.85 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.87 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.1 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.4 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	134	330	59.3		93.1		49.5		56.7		44		48.6		54.8		91.1		49.9	
7440-41-7	BERYLLIUM	3.3	16	0.98	U	0.59	J	0.35	J	0.29	J	0.27	J	0.24	J	0.36	J	0.5		0.37	J
7440-43-9	CADMIUM	0.61	0.36	0.49	U	0.082	U	0.061	U	0.082	U	0.081	U	0.082	U	0.08	U	0.083	U	0.17	U
7440-70-2	CALCIUM	2590	NA	34.5		45.3		23.2		11.5		28.6		14.4		26.3		19.7		24.7	
7440-47-3	CHROMIUM	60.1	**26**	37.8 [PAL] [SSL]		31.3 [PAL] [SSL]		25.8		26.4 [PAL] [SSL]		19.8		22.9		21.6		38.2 [PAL] [SSL]		23.5	
7440-48-4	COBALT	133	2.3	2.7 [PAL] [ORNL]	J	3.6 [PAL] [ORNL]		2		1.7		2.5 [PAL] [ORNL]		1.9		2.5 [PAL] [ORNL]		2.9 [PAL] [ORNL]		1.9	
7440-50-8	COPPER	48.6	28	13.3	K	9.1		12.4		10.4		4.6		3.9	K	5.3		10.1		6.2	K
7439-89-6	**IRON**	83100	5500	**89500 [BKG] [PAL] [ORNL] [MDRES]**		14500 [PAL] [ORNL] [MDRES]		19500 [PAL] [ORNL] [MDRES]		10200 [PAL] [ORNL] [MDRES]		9620 [PAL] [ORNL] [MDRES]		13600 [PAL] [ORNL] [MDRES]		12500 [PAL] [ORNL] [MDRES]		17800 [PAL] [ORNL] [MDRES]		21600 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	19.2 [PAL] [SSL]		13 [PAL] [SSL]		13.4 [PAL] [SSL]		13.4 [PAL] [SSL]		12.5 [PAL] [SSL]		12.1 [PAL] [SSL]		10.3		14.3 [PAL] [SSL]		11.7 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	**15.3 [PAL] [OPLNT]**		**21.5 [PAL] [ORNL] [OPLNT]**		**16.3 [PAL] [ORNL] [OPLNT]**		**24.2 [PAL] [ORNL] [OPLNT]**		**19 [PAL] [ORNL] [OPLNT]**		**21.9 [PAL] [ORNL] [OPLNT]**		**17.8 [PAL] [ORNL] [OPLNT]**		**29.6 [PAL] [ORNL] [OPLNT]**		**17 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1310	K	2030	K	997	K	1140	K	948	K	1110	K	1270	K	1900	K	1040	K
7439-96-5	MANGANESE	4130	160	44.5		33.8		27.8		17.4		30.3		16		29.2		28.7		29.4	
7439-97-6	MERCURY	0.18	0.058	0.019	J	0.023	J	0.014	UL	0.013	UL	0.045	J	0.058	J	0.02	J	0.03	J	0.052	J
7440-02-0	NICKEL	18.2	38	11.8		11.9		7.8		6.6		5.9		6.6		7.1		11.3		7.8	
7440-09-7	POTASSIUM	2610	NA	1690	K	1950	K	1670	K	1960	K	806	K	996	K	1250	K	3130 [BKG]	K	871	K
7782-49-2	SELENIUM	13.3	0.52	0.25	K	0.033	U	0.067	J	0.032	UL	0.033	UL	0.032	UL	0.033	UL	0.033	UL	0.033	U
7440-22-4	SILVER	11.4	4.2	0.49	UL	0.082	UL	0.081	UL	0.082	UL	0.081	UL	0.082	UL	0.08	UL	0.083	UL	0.17	UL
7440-23-5	SODIUM	258	NA	52.1	J	127		64.5		82.7		46.2		54.5		106		167		99.5	
7440-24-6	STRONTIUM	NA	120	5.3	J	7.5		6.6		6.9		4.4		4.9		5.9		10.6		3.5	K
7440-31-5	**TIN**	NA	0.89	4.9	U	**1.1 [PAL] [BTAG]**	J	0.82	U	**0.98 [PAL] [BTAG]**	J	0.82	J	**0.96 [PAL] [BTAG]**	J	0.81	U	**1.5 [PAL] [BTAG]**	J	1.7	U
7440-62-2	VANADIUM	194	7.8	50.5 [PAL] [ORNL] [MDRES] [SSL]	K	50.2 [PAL] [ORNL] [MDRES] [SSL]	K	40.2 [PAL] [ORNL] [MDRES] [SSL]	K	42.7 [PAL] [ORNL] [MDRES] [SSL]	K	32.9 [PAL] [MDRES] [SSL]	K	37.4 [PAL] [MDRES] [SSL]	K	35.4 [PAL] [MDRES] [SSL]	K	62.6 [PAL] [ORNL] [MDRES] [SSL]	K	42.2 [PAL] [ORNL] [MDRES] [SSL]	K
7440-66-6	ZINC	70.40	46	32.8		25.5		20.3		18.7		19.3		20.3		20.5		27.5		25	
	Miscellaneous Paramters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)		NC							42.6						42.9		42.2			
TTNUS288	PERCENT MOISTURE (%)		NC							17						15		23.3			
TTNUS002	PH (S.U.) S.U.		NC							4.64						5.3		5.14			
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66550	NC							48	J					116		535			
TTNUS046	TOTAL SOLIDS (%)		NC							83						85		76.7			

TABLE 11-3

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO CASING DISPOSAL AREA (UXO-23)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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	parameter			column20		column22		column23		column25		column28		column30		column32	
	nsample			X23SB0050406		X23SB0060204		X23SB0060204-AVG		X23SB0060204-D		X23SB0060406		X23SB0070204		X23SB0070406	
	location			X23SB005		X23SB006		X23SB006		X23SB006		X23SB006		X23SB007		X23SB007	
	sample_coc			X23SB0050406		X23SB0060204		X23SB0060204-AVG		FD031110-01		X23SB0060406		X23SB0070204		X23SB0070406	
	sample_date			20100311		20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		FD		NM		NM		NM	
	sacode			NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate									X23SB0060204							
	top_depth			4.00		2.00		2.00		2.00		4.00		2.00		4.00	
	bottom_dep			6.00		4.00		4.00		4.00		6.00		4.00		6.00	
	submatrix			SB		SB		SB		SB		SB		SB		SB	
	depth_stat			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	z			019		021		022		024		027		029		031	
cas	x	utl95	minorpal	c_019		c_021		c_022		c_024		c_027		c_029		c_031	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	**3.6**	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.24	UL
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.24	UL
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
99-99-0	4-NITROTOLUENE	NA	30	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
55-63-0	NITROGLYCERIN	NA	0.61	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL
78-11-5	PETN	NA	NA	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL
121-82-4	RDX	NA	5.5	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
479-45-8	TETRYL	NA	24	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
	Inorganics (mg/kg)																
7429-90-5	**ALUMINUM**	35400	7700	26200 [PAL] [ORNL] [MDRES]	J	13400 [PAL] [ORNL] [MDRES]	J	13700 [PAL] [ORNL] [MDRES]	J	14000 [PAL] [ORNL] [MDRES]	J	20600 [PAL] [ORNL] [MDRES]	J	14800 [PAL] [ORNL] [MDRES]	J	16600 [PAL] [ORNL] [MDRES]	J
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.033	UL	0.0325	UL	0.032	UL	0.032	UL	0.033	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	0.94 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.53 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.965 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.83 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.1 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	134	330	43.4		29.2		37.5		45.8		40.1		31.8		24.2	
7440-41-7	BERYLLIUM	3.3	16	0.23	J	0.17	U	0.1975	J	0.31	J	0.22	J	0.23	J	0.16	U
7440-43-9	CADMIUM	0.61	0.36	0.082	U	0.083	U	0.083	U	0.083	U	0.081	U	0.081	U	0.081	U
7440-70-2	CALCIUM	2590	NA	16.7		12.1		15.85		19.6		15.1		20.6		12.3	
7440-47-3	CHROMIUM	60.1	**26**	21.1		14.1		17.2		20.3		16.7		13.8		11.2	
7440-48-4	COBALT	133	2.3	1.8		1.1		1.35		1.6		1.4		1.1		0.8	
7440-50-8	COPPER	48.6	28	4.9		3.8		4.25		4.7		4.3		3.7	K	2.4	K
7439-89-6	**IRON**	83100	5500	10600 [PAL] [ORNL] [MDRES]		5380		9490 [PAL] [ORNL] [MDRES]		13600 [PAL] [ORNL] [MDRES]		9240 [PAL] [ORNL] [MDRES]		11900 [PAL] [ORNL] [MDRES]		8160 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	11.2 [PAL] [SSL]		8.4		8.5		8.6		9		7.4		7.3	
7439-93-2	**LITHIUM**	NA	2	**19.6 [PAL] [ORNL] [OPLNT]**		**11.8 [PAL] [OPLNT]**		**12.6 [PAL] [OPLNT]**		**13.4 [PAL] [OPLNT]**		**13.2 [PAL] [OPLNT]**		**9.7 [PAL] [OPLNT]**		**8.7 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1100	K	621	K	765.5	K	910	K	807	K	635	K	529	K
7439-96-5	MANGANESE	4130	160	17.2		14.8		17.95		21.1		16.9		18.4		12.5	
7439-97-6	MERCURY	0.18	0.058	0.055	J	0.021	J	0.023	J	0.025	J	0.022	J	0.037	J	0.057	J
7440-02-0	NICKEL	18.2	38	7.5		4		5.4		6.8		5.6		4.5		3.4	
7440-09-7	POTASSIUM	2610	NA	999	K	560	K	800	K	1040	K	796	K	449	K	418	K
7782-49-2	SELENIUM	13.3	0.52	0.033	UL	0.033	UL	0.0325	UL	0.032	U	0.032	UL	0.033	UL	0.033	UL
7440-22-4	SILVER	11.4	4.2	0.082	UL	0.083	UL	0.083	UL	0.083	UL	0.081	UL	0.081	UL	0.081	UL
7440-23-5	SODIUM	258	NA	73		27.8		36.1		44.4		37.2		48.9		37.8	
7440-24-6	STRONTIUM	NA	120	4.4		2.7		3.75		4.8		4.3		1.9	K	1.9	
7440-31-5	TIN	NA	0.89	0.87	J	0.83	U	0.83	U	0.83	U	0.82	U	0.81	U	0.81	U
7440-62-2	VANADIUM	194	7.8	33.3 [PAL] [MDRES] [SSL]	K	23.5 [PAL] [MDRES] [SSL]	K	29.95 [PAL] [MDRES] [SSL]	K	36.4 [PAL] [MDRES] [SSL]	K	26.8 [PAL] [MDRES] [SSL]	K	25.1 [PAL] [MDRES] [SSL]	K	20.1 [PAL] [MDRES] [SSL]	K
7440-66-6	ZINC	70.40	46	21.9		12.6		15		17.4		15.9		16		13.3	
	Miscellaneous Paramters																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)		NC														
TTNUS288	PERCENT MOISTURE (%)		NC														
TTNUS002	PH (S.U.) S.U.		NC														
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66550	NC														
TTNUS046	TOTAL SOLIDS (%)		NC														

TABLE 11-3

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO CASING DISPOSAL AREA (UXO-23)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column34		column36		column38		column40		column42		column44	
	nsample			X23SB0080204		X23SB0080406		X23SB0090204		X23SB0090406		X23SB0100204		X23SB0100406	
	location			X23SB008		X23SB008		X23SB009		X23SB009		X23SB010		X23SB010	
	sample_coc			X23SB0080204		X23SB0080406		X23SB0090204		X23SB0090406		X23SB0100204		X23SB0100406	
	sample_date			20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO	
	duplicate														
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00	
	submatrix			SB		SB		SB		SB		SB		SB	
	depth_stat			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	z			033		035		037		039		041		043	
cas	x	utl95	minorpal	c_033		c_035		c_037		c_039		c_041		c_043	
	Explosives (mg/kg)														
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	**3.6**	0.24	UL	0.25	UL	0.25	U	0.25	UL	0.24	UL	0.25	UL
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
88-72-2	2-NITROTOLUENE	NA	2.9	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	UL	0.25	UL	0.25	U	0.25	UL	0.24	UL	0.25	UL
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
99-99-0	4-NITROTOLUENE	NA	30	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
2691-41-0	HMX	NA	380	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.19	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
55-63-0	NITROGLYCERIN	NA	0.61	1.1	UL	1.2	UL	1.2	U	1.2	UL	1.2	UL	1.2	UL
78-11-5	PETN	NA	NA	1.1	UL	1.2	UL	1.2	U	1.2	UL	1.2	UL	1.2	UL
121-82-4	RDX	NA	5.5	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
479-45-8	TETRYL	NA	24	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
	Inorganics (mg/kg)														
7429-90-5	**ALUMINUM**	35400	7700	17700 [PAL] [ORNL] [MDRES]	J	18100 [PAL] [ORNL] [MDRES]	J	**35500 [BKG] [PAL] [ORNL] [MDRES]**	J	16500 [PAL] [ORNL] [MDRES]	J	20600 [PAL] [ORNL] [MDRES]	J	19200 [PAL] [ORNL] [MDRES]	J
7440-36-0	ANTIMONY	1.8	0.27	0.034	J	0.032	UL	0.044	J	0.042	J	0.035	J	0.043	J
7440-38-2	ARSENIC	18.9	0.026	2.1 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.7 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.9 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	134	330	66.2		27.4		92.8		47.6		44		43.5	
7440-41-7	BERYLLIUM	3.3	16	0.61		0.49	U	1		0.39	J	0.4	J	0.38	J
7440-43-9	CADMIUM	0.61	0.36	0.082	U	0.082	U	0.17	U	0.082	U	0.083	U	0.082	U
7440-70-2	CALCIUM	2590	NA	128		13.3		129		47.8		72.4		58.3	
7440-47-3	CHROMIUM	60.1	**26**	20.3		16.5		35.3 [PAL] [SSL]		20.5		20.6		22.9	
7440-48-4	COBALT	133	2.3	8.5 [PAL] [ORNL]		1.1		7.6 [PAL] [ORNL]		2.5 [PAL] [ORNL]		3.6 [PAL] [ORNL]		3.2 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	5.8		4.7		15.4		7		7		7.5	
7439-89-6	**IRON**	83100	5500	16300 [PAL] [ORNL] [MDRES]		10700 [PAL] [ORNL] [MDRES]		33400 [PAL] [ORNL] [MDRES]		15700 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]		20300 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	12.8 [PAL] [SSL]		8.4		14.3 [PAL] [SSL]		8.7		10		9.6	
7439-93-2	**LITHIUM**	NA	2	15 [PAL] [OPLNT]		12.5 [PAL] [OPLNT]		**24.4 [PAL] [ORNL] [OPLNT]**		12.4 [PAL] [OPLNT]		13.9 [PAL] [OPLNT]		13.9 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	2640	4400	1160	K	649	K	2940 [BKG]	K	1240	K	1060	K	995	K
7439-96-5	MANGANESE	4130	160	172 [PAL] [MDRES]		12.4		147		44.1		80.2		76	
7439-97-6	MERCURY	0.18	0.058	0.053	J	0.056	J	0.035	J	0.016	J	0.039	J	0.071 [PAL] [BTAG]	J
7440-02-0	NICKEL	18.2	38	10.5		4.9		18.1		8.4		8		7.8	
7440-09-7	POTASSIUM	2610	NA	930	K	699	K	2030	K	953	K	782	K	894	K
7782-49-2	SELENIUM	13.3	0.52	0.059	J	0.032	UL	0.065	UL	0.033	UL	0.032	UL	0.032	UL
7440-22-4	SILVER	11.4	4.2	0.082	UL	0.082	UL	0.17	UL	0.082	UL	0.083	UL	0.082	UL
7440-23-5	SODIUM	258	NA	52.7		31.8		136		68.6		42		82.8	
7440-24-6	STRONTIUM	NA	120	4.3		2.6		7.6		4		3.2	K	3.3	K
7440-31-5	TIN	NA	0.89	0.83	U	0.82	U	1.7	U	0.82	U	0.83	U	0.82	U
7440-62-2	VANADIUM	194	7.8	33.9 [PAL] [MDRES] [SSL]	K	29.3 [PAL] [MDRES] [SSL]	K	57.6 [PAL] [ORNL] [MDRES] [SSL]	K	31.4 [PAL] [MDRES] [SSL]	K	34 [PAL] [MDRES] [SSL]	K	37 [PAL] [MDRES] [SSL]	K
7440-66-6	ZINC	70.40	46	39.2		16.8		50.4 [PAL] [SSL]		22.1		26.7		39.3	
	Miscellaneous Paramters														
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)		NC												
TTNUS288	PERCENT MOISTURE (%)		NC												
TTNUS002	PH (S.U.) S.U.		NC												
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66550	NC												
TTNUS046	TOTAL SOLIDS (%)		NC												

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

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1254000

322000

N

100% UXO Detector-Aided Sweep and Geophysical Survey (using 10-foot line spacing shown with revised area from PA)

Archer Avenue

80
85
90
95
100
105
110
75
70
65

100 50 0 100 Feet

Legend

Revised Torpedo Casing Disposal Area from PA

Topographic Contour (5 ft)

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	8/24/07
CHECKED BY	DATE
E. BERKLITE	5/28/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

TORPEDO CASING DISPOSAL (UXO-23)
MEC INVESTIGATION LOCATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	
N62467-04-D-0055	
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 11-1	0

1254000

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1253500

1254000

322000

Buried Ferrous Metallic Item #	easting	northing
1	1253747	321938
2	1253795	321934
3	1253806	321969
4	1253843	321998

Note: Coordinates stated in NAD83 Maryland State Plane in US Survey Feet.

N

4.7 4.5 4.2 4.0 3.7 3.5 3.2 2.9 2.7 2.4 2.2 1.9 1.7 1.4 1.2 0.9 0.6 0.4 0.1 -0.1 -0.4 -0.6 -0.9 -1.2 -1.4 -1.7 -1.9 -2.2 -2.4 -2.7 -2.9 -3.2 -3.5 -3.7 -4.0 -4.2 -4.5 -4.7

Vertical Magnetic Gradient (nT/ft)

75 80 85 90

1 2 3 4

Legend

- Buried Small Ferrous-Metallic Items (4 anomalies identified)
- Concentration of Buried Ferrous Metal
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

NOTE: Geometric G-858G data shown.

50 25 0 50 Feet

DRAWN BY	DATE
K. MOORE	8/24/07
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

TORPEDO CASING DISPOSAL (UXO-23)
GEOPHYSICAL ANOMALIES LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 11-2	0

1253500

1254000

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1253500

1254000

322000

N

X23SB001

X23SB002

X23SB003

X23SB004

X23SB005

X23SB006

X23SB007

X23SB008

X23SB009

X23SB010

75

80

85

90

Vertical Magnetic Gradient
(nT/2-ft)

5 4 4 4 4 3 3 3 3 2 2 2 2 1 1 1 1 0 0 -0 -0 -1 -1 -1 -1 -2 -2 -2 -2 -3 -3 -3 -3 -4 -4 -4 -4 -5

Legend

- Buried Small Ferrous-Metallic Items (4 anomalies identified)
- Soil Sample Location
- Concentration of Buried Ferrous Metal
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

50 25 0 50 Feet

DRAWN BY	DATE
K. MOORE	8/24/07
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

TORPEDO CASING DISPOSAL (UXO-23)
SAMPLE LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 11-3	0

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1254000

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1253500

1254000

322000

322000

N

X23SB001
Depth = 2 - 4
Inorganics (mg/kg)
IRON 89500 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 15.3 [PAL] [OPLNT]
Depth = 4 - 6
LITHIUM 21.5 [PAL] [ORNL] [OPLNT]
TIN 1.1

X23SB002
Depth = 2 - 4
Inorganics (mg/kg)
LITHIUM 16.3 [PAL] [ORNL] [OPLNT]
Depth = 4 - 6
LITHIUM 24.2 [PAL] [ORNL] [OPLNT]
TIN 0.98 [PAL] [BTAG]

X23SB003
Depth = 2 - 4
Inorganics (mg/kg)
LITHIUM 19 [PAL] [ORNL] [OPLNT]
Depth = 4 - 6
LITHIUM 21.9 [PAL] [ORNL] [OPLNT]
TIN 0.96 [PAL] [BTAG]

X23SB004
Depth = 2 - 4
Inorganics (mg/kg)
LITHIUM 17.8 [PAL] [ORNL] [OPLNT]
Depth = 4 - 6
LITHIUM 29.6 [PAL] [ORNL] [OPLNT]
TIN 1.5 [PAL] [BTAG]

X23SB005
Depth = 2 - 4
Inorganics (mg/kg)
LITHIUM 17 [PAL] [ORNL] [OPLNT]
Depth = 4 - 6
LITHIUM 19.6 [PAL] [ORNL] [OPLNT]

X23SB006
Depth = 2 - 4
Inorganics (mg/kg)
LITHIUM 11.8 [PAL] [OPLNT]
Depth = 4 - 6
LITHIUM 13.2 [PAL] [OPLNT]
X23SB006 (DUP)
Depth = 2 - 4
Inorganics (mg/kg)
LITHIUM 13.4 [PAL] [OPLNT]

X23SB007
Depth = 2 - 4
Inorganics (mg/kg)
LITHIUM 9.7 [PAL] [OPLNT]
Depth = 4 - 6
LITHIUM 8.7 [PAL] [OPLNT]

X23SB008
Depth = 2 - 4
Inorganics (mg/kg)
LITHIUM 15 [PAL] [OPLNT]
Depth = 4 - 6
LITHIUM 12.5 [PAL] [OPLNT]

X23SB009
Depth = 2 - 4
Inorganics (mg/kg)
ALUMINUM 35500 [BKG] [PAL] [ORNL] [MDRES]
LITHIUM 24.4 [PAL] [ORNL] [OPLNT]
Depth = 4 - 6
LITHIUM 12.4 [PAL] [OPLNT]

X23SB010
Depth = 2 - 4
Inorganics (mg/kg)
LITHIUM 13.9 [PAL] [OPLNT]
Depth = 4 - 6
LITHIUM 13.9 [PAL] [OPLNT]

75

50

50 25 0 50
Feet

Legend

- Soil Boring
- MRP Area Boundary Identified during PA
- Topographic Contour (5-ft)

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

DRAWN BY	DATE
K. MOORE	6/1/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

NAVFAC

TORPEDO CASING DISPOSAL AREA (UXO-23)
SUBSURFACE SOIL METALS EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER
N62467-04-D-0055

APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—

FIGURE NO. FIGURE 11-4 REV 0

1253500

1254000

LEGEND

MRP AREA BOUNDARY IDENTIFIED DURING PA

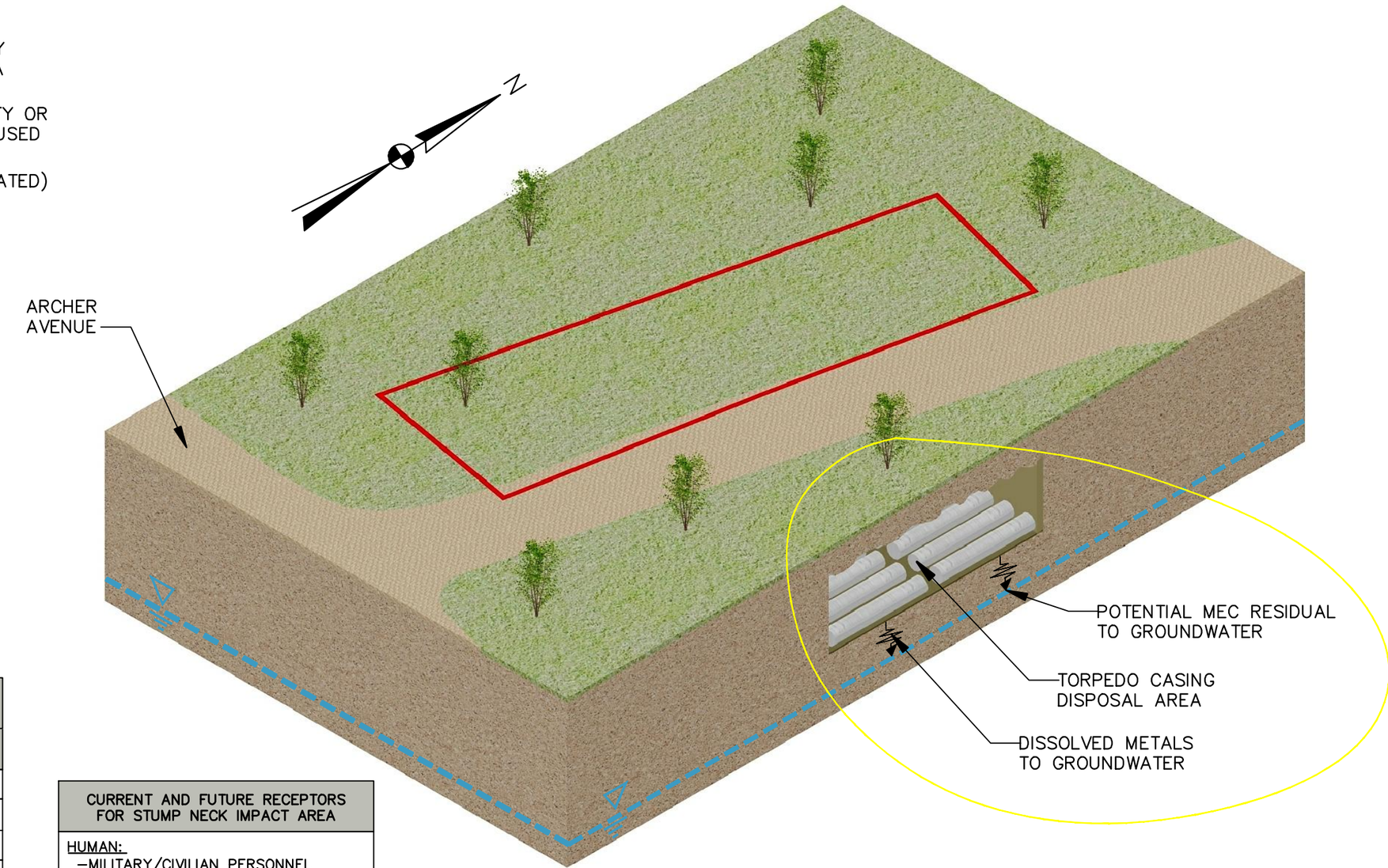
SITE SPECIFIC ACTIVITY OR TYPE OF MUNITIONS USED

WATER TABLE (ESTIMATED)

TREE

DIRT ROAD

FOREST



ALUMINUM AND IRON EXCEEDANCES IN SUBSURFACE SOIL	
SAMPLE I.D.	CONSISTENT CONCENTRATION
X23SB0010204	89500 (IRON)
X23SB0090204	35500 mg/kg (ALUMINUM)
X23SB0010406	TIN: 1.1 mg/kg
X23SB0020406	TIN: 0.98 mg/kg
X23SB0030406	TIN: 0.96 mg/kg
X23SB0040406	TIN: 1.5 mg/kg
NOTE: ALL SUBSURFACE SOIL SAMPLING LOCATIONS EXCEED FOR LITHIUM	

CURRENT AND FUTURE RECEPTORS FOR STUMP NECK IMPACT AREA
HUMAN: –MILITARY/CIVILIAN PERSONNEL –CONTRACTORS –TRESPASSERS
ECOLOGICAL: –PLANTS –INVERTEBRATES –BIRDS –MAMMALS

DRAWN BY ND	DATE 6–8–10
CHECKED BY	DATE
REVISED BY	DATE
SCALE NOT TO SCALE	

NAVFAC

TORPEDO CASING ISPOSAL AREA UXO–23 CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND

CONTRACT NO. 0810	
OWNER NO.	
APPROVED BY	DATE
DRAWING NO. FIGURE 11–5	REV. 0

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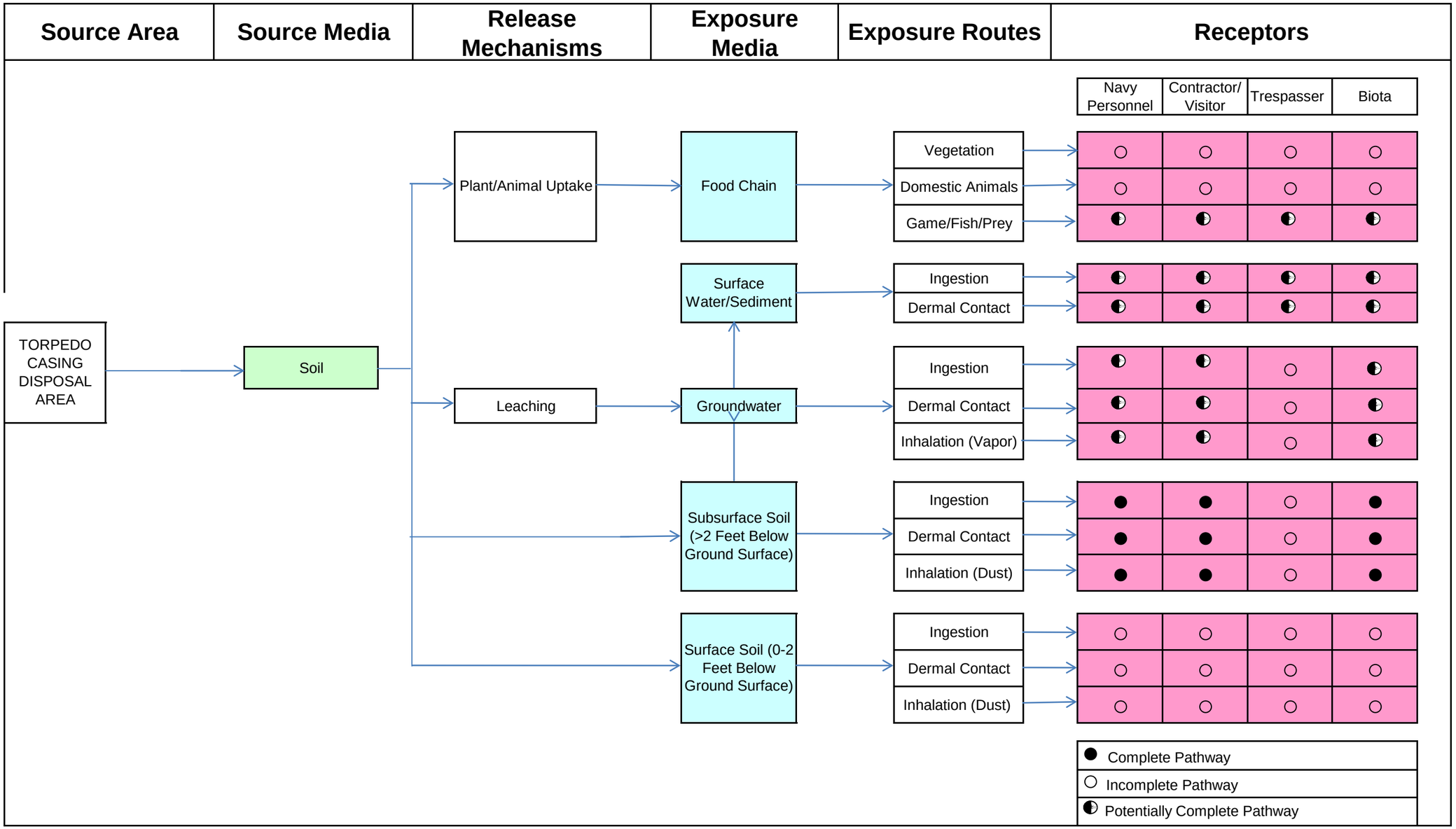
FIGURE 11-6

MC EXPOSURE PATHWAY ANALYSIS

TORPEDO CASING DISPOSAL AREA UXO 23

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



12.0 VALLEY IMPACT AREA – UXO-26

12.1 LOCATION AND SETTING

The Valley Impact Area, approximately 694 acres, covers the majority of the western side of the Stump Neck Annex. The acreage of the Valley Impact Area includes the land portion of the Stump Neck Annex that is covered by the Valley firing fan safety danger zone (SDZ), and excludes acreages that are part of other MRP sites. The Valley Impact Area may have received a variety of projectiles from 1891 through 1921 because the Valley firing fan SDZ extends over the Valley Impact Area. In addition to the Valley Impact Area, the firing fan extends over areas of the Potomac River, Chicamuxen Creek, Mattawoman Creek, and portions of land outside the Installation boundary to the south of Stump Neck Annex. This report only addressed that portion of the Valley Impact Area that is located on Stump Neck Annex.

12.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

Numerous Navy buildings, roads, and utilities associated with the development of Stump Neck are located within the site boundaries of the Valley Impact Area. These buildings are used for office and classroom space, and munitions development for training purposes. Some portions of the Valley Impact Area are used as a Species Protection Area. According to the installation's 2003 Utilities Data Map, there are potable water, sewer, and electric lines in areas of the Valley Impact Area that are not included as Species Protection Areas. The Valley Impact Area was used as a target (landing spot) for test firing from the Valley site from 1891 through 1921, and as a target for Marine firing from 1931 through 1934. There is no current information of any future land use plans for the Valley Impact Area. According to the 2003-2004 Stump Neck Annex Hunting Map, a large portion of the Valley Impact Area is located in an upland hunting area.

12.3 TOPOGRAPHY

The lowest points lie along the Mattawoman and Chicamuxen Creek shorelines. These shoreline areas are mostly flat, tidal marsh areas, although several 50- to 60-feet high bluffs exist along Mattawoman Creek.

12.4 GEOLOGY

Although no range-specific geology information is available for the Valley Impact Area, the topography discussed in Section 1.2.3 - Topography supports the description of upland deposits that crop out at the

surface in the northern portion of NSF-IH where surface elevations exceed 40 feet above msl. However, beneath most of the study area, the surficial sediments consist of Pleistocene paleochannel deposits and Holocene alluvial and paludal deposits (Hiortdah., 1997). These deposits consist of gravel, sand, silt, clay, and peat mixtures with irregular bedding and with an aggregate thickness of 0 to approximately 40 feet. The Aquia Formation and younger upland deposits are missing in many locations in the NSF-IH peninsula area as a result of erosion and deposition in Pleistocene and along the shorelines of the Stump Neck Annex adjacent to Mattawoman Creek and Chicamuxen Creek. These areas are mostly flat, tidal marsh areas, although several 50- to 60-foot bluffs exist along Mattamwoman Creek.

12.5 SOIL AND VEGETATION

Because the Valley Impact Area covers such a large area, there are several varieties of vegetation and soil types associated with the site.

12.6 HYDROLOGY

Mattawoman and Chicamuxen Creeks have large floodplains and contain large areas of tidal wetlands and swamps, some of which are located within the Valley Impact Area. Many small streams located throughout the Valley Impact Area flow to one of these two major waterways.

12.7 HYDROGEOLOGY

There is no range-specific hydrogeology information for the Valley Impact Area although groundwater is expected to flow towards the lowest areas of the shorelines of Mattawoman and Chicamuxen Creeks.

12.8 WETLANDS

Mattawoman and Chicamuxen Creeks have large floodplains and contain large areas of tidal wetlands and swamps, some of which are located within the Valley Impact Area. Numerous wetland areas are located within the Valley Impact Area. Surface water could potentially erode the soil and transport contaminants in the wetlands.

12.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

According to the 2003-2004 Stump Neck Annex Hunting Map, hunting is permitted throughout various areas of the Valley Impact Area. The Chicamuxen WMA is located within the Valley Impact Area; however, this area is not located within the Installation boundaries. A Phase I Cultural Resources Survey

and Supplemental Architectural Investigations were conducted at Stump Neck in 1996. The survey identified 10 sites of archeological and cultural significance in the Valley Impact Area.

Figure10.8-1: Archeological Sites within the Eastern Most Portion of the Valley Impact Area (Source: UFP SAP Appendix B)

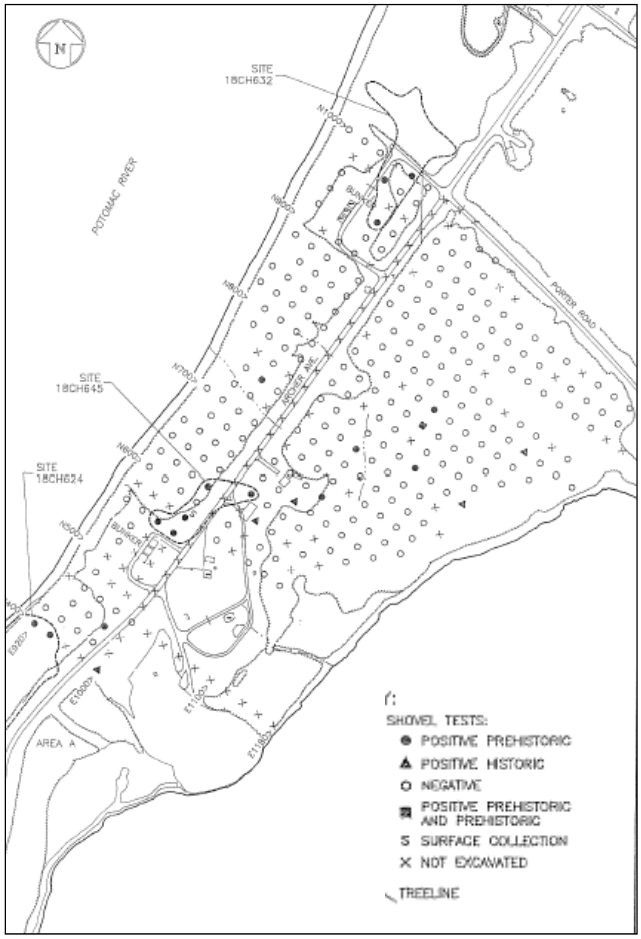


Figure 10.8-2: Archeological Sites within the Central Portion of the Valley Impact Area

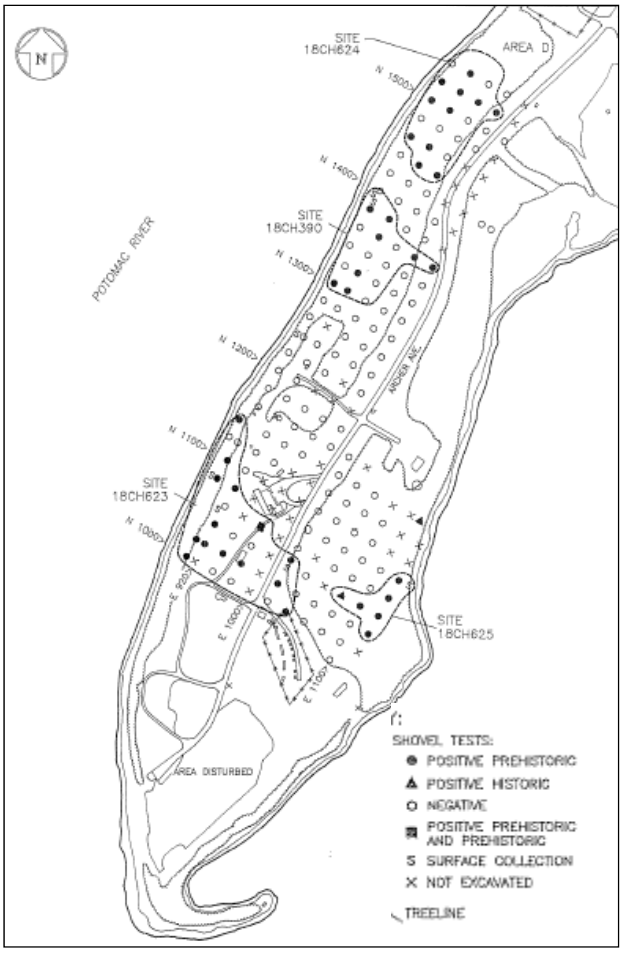


Figure 10.8-3: Archeological Sites within the Southwestern Tip of the Valley Impact Area

(Source: UFP SAP Appendix B)

12.10 HISTORICAL INFORMATION

The Valley Impact Area on the Stump Neck Annex was used as a long-range Naval gunnery target by the Indian Head Main Installation (between the Potomac River and Mattawoman Creek to the northeast) from the early 1890s through the early 1920s. The Valley is a 694-acre site located on the Indian Head main installation that was used for developing and testing numerous ordnance items from 1891 through 1921. According to historical documentation, practically all forms of Naval ordnance used from the 1890s until the 1920s (1-inch through 16-inch) were tested and/or developed at The Valley and fired onto The Valley Impact Area.

The Valley Impact Area is part of the firing fan for the Indian Head Valley gun proving site firing point, which was used from 1891 to 1921. Projectiles from a wide variety of ordnance fired from the Valley gun proving site may have impacted the Valley Impact Area. In addition, the Valley Impact Area also received ordnance from a firing range set up by units from the Quantico MCB (on Stump Neck Annex near Rum Point—the exact location is unknown) for 75-mm guns and howitzers. MCB Quantico was also permitted to fire large artillery at Stump Neck Annex for several years until 1934. Based on historical use, the portion of the Stump Neck peninsula overlapped by the Valley Impact Area is suspect for MEC.

12.11 MUNITIONS USED

This section describes the munitions and munitions-related materials known or suspected to be at the site, including the types and estimated maximum penetration depths. This includes both MEC and nonhazardous munitions-related debris (e.g., fragmentation, base plates, inert mortar fins). Potential ordnance concentration areas are presented along with a discussion on the presence of any special consideration ordnance. Historical documentation states that various calibers of guns (4-inch through 16-inch) were proved at the Valley with various projectiles. The Valley Impact Area received many of the projectiles from gun proving activities at the Valley. Tested shells contained different types of explosive fillers, including black powder, smokeless powder, brown prismatic powder, emmensite, joveite, wet gun cotton, randite and other high explosives (e.g., Thorite). Records detailing specific types and quantities of munitions at the Valley Impact Area are limited. Identified records from testing at the Valley site listed items such as the number of guns proved and/or number of projectiles used, but documentation did not indicate specific explosive types and quantities that could be used to determine the amount of MEC that may be located within the areas associated with the Valley Impact Area. Historical documents listed some quantities of explosive powders that were used during testing activities at the Valley. These quantities of explosive powders were recorded at the Valley as tested or fired; however, some of the actual impacts of these explosive powder-filled projectiles would be at the Valley Impact Area. Therefore, it should be assumed that the Valley Impact Area contains those materials as well. Listed below are some of the quantities of explosive powders used. This list is not intended to be all inclusive. The 1892 Bureau of Ordnance Annual Report contained information on two specific shells filled with 42 pounds of explosive powder and 42 pounds of emmensite (high explosive). In addition, the following types and amounts of powder were documented:

- 1894 Annual Report – Powder expended during testing: 56,981 pounds.
- 1897 Annual Report – Powder expended during testing: 50,000 pounds, including:
  - Wet gun cotton: 47 pounds.
  - Shell powder: 220.25 pounds.

  - Randite: 4 pounds and 3.2 ounces.
  - Joveite: 10.75 pounds.
  - Picric acid: 2 Pounds.
- 1901 Annual Report – Powder: 46 pounds.
- 1901 Annual Report – Powder: 350 pounds.
- 1919 Annual Report – Smokeless Powder: 831,033 pounds.
- 1920 Annual Report – Smokeless Powder: 419,607 pounds.

In addition to munitions received from the Valley, 75-mm projectiles fired from MCB Quantico impacted the Valley Impact Area. Howitzer and 75-mm shells were also fired from a Marine range located at Stump Neck. No documentation was found identifying the quantities and types of these projectiles. Based on the information obtained during the data collection process, no special consideration munitions are known or suspected to have been used at the site; therefore, the Valley Impact Area is not suspected to contain special consideration MEC.

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 12-1.

A variety of munitions and projectiles have been fired during proving ground tests at Stump Neck Annex. The Valley Impact Area (694 acres) covers most of the land portion of Stump Neck Annex west of the Stump Neck Impact Area within the firing fan of the Valley. The Valley Proving Ground tested and fired munitions associated with 1-inch, 3-inch, 4-inch, 5-inch, 6-inch, 7-inch, 8-inch, 10-inch, 12-inch, 14-inch and 16-inch Naval guns onto Stump Neck Annex impact areas (the Valley Impact Area) from 1891 to 1921. Additional proving ground and training activities may also have fired projectiles and test munitions into these impact areas.

The Valley Impact Area also received ordnance from a firing range set up by units from the MCB Quantico (on Stump Neck Annex near Rum Point—the exact location is unknown) for 75-mm guns and howitzers. Historical documentation also indicated that MCB Quantico was also permitted to fire large artillery at Stump Neck Annex for several years until 1934.

The shells fired onto the Valley Impact Area contained different types of explosive fillers including black powder, smokeless powder, brown prismatic powders, emmensite, joveite, wet gun cotton, randite, and other high explosives, (e.g., Thorite).

12.12 MUNITIONS CONSTITUENTS

Several environmental sampling events have been conducted on sites located within the Valley Impact Area. Information relating to MC from those sampling events is discussed in each individual PA site section. Based on the history of the range as an impact area for an assortment of Naval ordnance, potential MC present at the Valley Impact Area could include Explosive D, black powder, TNT, magnesium, NH powder, CTNT, and other various metals and chemicals associated with pyrotechnics, such as perchlorate and propellants. The potential MC released by projectiles and munitions fired into the Valley Impact Area from the Valley Proving Ground gun and munitions testing activities include multiple metals, explosive constituents, and various chemicals associated with pyrotechnics, such as perchlorate and propellants. A partial list of known explosives tested in the Valley includes the following:

- Powder
- Wet gun cotton
- Shell powder
- Randite
- Joveite
- Picric acid
- Smokeless powder

MC commonly included in 75-mm, 37-mm, and 155-mm ammunition are as follows:

- TNT
- HMX
- Composition B
- Composition D
- Perchlorate

No surface or subsurface sampling has been conducted at the Valley Impact Area. Potential MC include TNT, HMX, Composition B and D, perchlorate, and other explosives such as black powder, smokeless powder, brown prismatic powder, emmensite, joveite, wet gun cotton, and randite.

12.13 MEC FIELD ACTIVITIES

12.13.1 Background

The Valley Impact Area is a very large mixed-use area (about 700 acres). Marshy, open, and large wooded areas are present. The site is believed to have been a peripheral potential impact zone for target fire directed at targets elsewhere that consisted of various-sized high explosives (HE) and shrapnel shot; consequently, no information about an actual target on the site was identified. Therefore, a VSP model was deemed unsuitable. A UXO detector-aided surface sweep and geophysical investigation were conducted using 19 transects to reconnoiter the accessible portions (by foot) of the mostly undeveloped portion of the site identified during the PA. Information from the geophysical survey and detector-aided surface sweep of the other sites inside the range fan for the Valley Impact Area were reviewed and reported in this investigation to determine if further investigation is warranted. The survey depth was, at a minimum, the top 2 feet for small artillery shells and increased for larger items (more metal mass and diameter).

The current MEC site investigation at the Valley Impact Area was limited to UXO detector-aided surface and subsurface geophysical investigations.

The initial horizontal boundary for the MEC investigation was the portions of the Valley Impact Area identified in the PA that were accessible by foot and survey instrument. The horizontal boundary did not include areas where development has occurred.

The initial vertical boundary for the MEC investigation (detector-aided surface sweeps and geophysical investigation) was 5 feet bgs within the accessible land area.

12.13.2 Scope

The scope of survey activities at the Valley Impact Area is summarized as follows (see Figure 12-1):

- Brush and vegetation clearing was necessary to support the detector-aided surface sweeps and geophysical investigation.

- UXO detector-aided surface sweeping of the geophysical survey area.

- Geophysical surveying across portions accessible by foot and instrument along 19 transects (approximately 400-foot transect spacing).

- Consulting with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with separate UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH IR Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items left in place were avoided during subsequent geophysical surveying. No MEC items were moved or disturbed during this phase of the project. Surface MD were reported on the log sheets or in the logbook for the site.

12.13.3 Site Preparation

Vegetation clearing activities in the Valley Impact Area consisted of cutting transects in the underdeveloped sections that ran through areas of large trees and thick vegetation. Vegetation removal was done by hand using weed-eaters and chainsaws. Transects were cut/cleared 5 feet wide and with a clearance of at least 12 inches to allow for the proper use of geophysical detectors on the site. Stakes were placed at each end of the transect line, and a GPS unit was used to create a path. Transects were then cut along the path as straight as possible avoiding trees over 2 inches in diameter. Limited pre-survey clearing was performed to allow data collection along 19 transects. Brush cutting and vegetation removal to support the detector-aided surface sweep was conducted to the degree necessary to allow the metal detector to get within a few inches of the ground surface. The magnetic detector is approximately 1 inch in diameter and is durable; therefore, it is possible to push the detector through brush and vegetation, and as a result, less brush cutting and vegetation removal were required. The all-metals detector has a detection head of approximately 8 inches and is more fragile than the magnetometer. Therefore, brush and vegetation was cleared to within a few inches of the ground surface.

The site is composed of various terrains, and required brush and vegetation cutting along the abovementioned geophysical survey transects. The transects were cleared of brush smaller than 2 inches in diameter and other vegetation to a level no greater than 12 inches above the ground surface along 3-foot-wide corridors on each transect to permit the passage of the survey equipment. Grassy areas, where encountered, were cut if the grass exceeded 2 feet in height. Trees and brush 2 inches in diameter and larger were not cut. The survey crew worked around these obstacles.

12.13.4 UXO Detector-Aided Surface Sweep

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix A – SOP OPS 1.

Detector-aided surface sweeps of 19 (400-foot spaced) parallel survey transects running north-south, 5 feet in width, were conducted across the accessible and non-developed portions of the site (Figure 12-1). Transects were sequentially numbered from west to east. The survey was conducted by UXO Technicians using hand held metal detectors (Schonstedt GA-52Cx). During the surface sweep, if visual observations or other information showed that non-ferrous metals from suspect MEC may be present, an all metals detector such as the White's Spectrum XLT was used. The all-metals detector was either used in place of, or in conjunction with, the magnetic locator. The decision as to whether one or both detectors were used was based on the ability to place the sensor of the all-metals detector within 1 foot of the ground surface, the relative proportion of ferrous items to non-ferrous items, and the types of items visually observed and their relative potential to be MEC or MPPEH.

The general UXO detector-aided survey was conducted as described in Section 3a.3. Locations where visual observations of suspect MEC, MPPEH, MD or subsurface anomalies were observed were marked with a stake. Pictures were taken of items observed on the surface. In clear areas, the locations were recorded using a GPS. In areas where tree canopy precluded use of a GPS, locations were established using a tape measure and compass measurements from a known location(s). All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures. The MEC hazard assessment methodology is described in Section 3a.5. MEC documentation is described in Section 3a.7.

12.13.5 Geophysical Survey

A Geometrics G-858G magnetometer was used at the site because the expected targets of the site (e.g., projectiles) were expected to be predominantly ferrous metal objects, and the instrument is portable in wooded settings like those present at the site. The geophysical team conducted the geophysical survey along the accessible portions of 19 transects. GPS data were integrated at 1 second intervals to position the geophysical data. Small subsurface objects such as individual mortar or artillery rounds can generally only be detected at shallow burial depths. However, these items may be buried relatively deep in the marshy ground of the Valley Impact Area, thereby possibly escaping detection by the geophysical

survey. Also, survey transects were expected to cross numerous cultural features (e.g., utilities) that would create data anomalies. Attempts were made to annotate these areas of potential interferences on the data figures. Targets of the geophysical investigation included small to large object sizes at this site, and therefore survey depths varied as well.

Before the geophysical surveys began, the UXO team conducted a visual and detector-aided surface sweep of the survey area. Any suspect MEC found during the surface sweep were flagged by the UXO team and reported, and the geophysical survey team avoided these areas.

12.14 DEVIATIONS FROM WORK PLAN

There were no deviations from the work plan.

12.15 MEC SURVEY RESULTS

The Field Forms are included in Appendix C. The UXO Surface Survey Activities are summarized below from the daily and weekly logs at the Valley Impact Area.

On December 15, 2009 through January 9, 2010 (non-consecutive days), the Valley Impact Area stakes for transects 1-19 were set and the transects were brush cut.

12.15.1 UXO Detector-Aided Surface Survey Results

The Valley Impact Area was investigated on two separate mobilizations in December, 2009 and January, 2010 with the following MEC discoveries:

- On December 18, 2009, the Valley Impact Area transects 19-14 were swept with Schonstedts.

- On January 5, 2010, the UXO Team identified two possible MEC items and five MD items in transects 19 and 14 of Valley Impact Area (two suspect MEC items BLU 3 and BLU 7 sub-munitions).

- On January 7, 2010, the UXO Team swept the southern swampy portions of transects 14, 15 and 16 in the Valley Impact Area; the southern portion of transect 17 was inaccessible. An SUU-14 submunition dispenser, still containing some submunitions (possibly BLU-3, BLU-17 or BLU-24) was located on Valley Impact Area Transect 15 (VIA T-15) (suspect MEC item SUU 7 Dispenser with possible submunitions).

- On January 8, 2010, the UXO Team located three MD items in transect 6, and five MD items in transect 10. The UXO team identified anomalies located previously in Valley Impact Area transects 14 and 19.

- On January 9, 2010, two MD items (M-100 series bomb fuzes) were located on transect 7.

In total, 3 MEC and 15 suspect MPPEH items were discovered during detector-aided surface surveys of the Valley Impact Area (Table ES-2). The suspect MEC items were marked and reported to the NSF-IH POC. UXO personnel were informed to stay out of the area until a disposition could be made regarding the items. Digital photographs were taken of the items and the GPS locations were recorded; upon review of the pictures and closer inspection of the items by the SUXOS, UXO personnel were still unable to positively identify the hazards associated with the suspect MEC items. Notifications were made concerning this discovery. A Navy EOD team from Dahlgren was called to respond to the site on January 21, 2010. The EOD team determined that two items, the SUU7 Dispenser and BLU 7 submunition, were hazardous and were transferred to Range 3 on the Stump Neck Annex and destroyed. All other suspect MEC items were classified as munitions debris and placed in an ammo can near SWMU 27 by the EOD.

05 JAN 10
VIA T14-03
BLU 7
MEC
5 1 2010

07 JAN 10
VIA T15-08
SUU-14 DISPENSER W/SUB-
MUNITIONS
MEC
7 1 2010

Table 12-2 presents a summary of the MEC/MPPEH items identified at the Valley Impact Area. Figure 12-2 shows the locations of the discoveries and Appendix D presents photographs of the MEC and MD items discovered during the detector-aided surface sweeps.

12.15.2 Geophysical Survey Results

Figure 12-3 displays the interpretation of the site data. Anomalies auto-selected (picked) using the Blakely Test from the UX-Detect module of Geosoft are shown by "+" symbols with a number identifier, and are identified as buried ferrous metallic items. Items were picked based on an anomaly amplitude threshold of 6nT/2 feet and higher, and 197 items are shown on the figure with their corresponding georeferenced coordinates listed separately in Appendix E Table 12-3. Although the items are scattered around the site, many tend to be located in clusters. The nature of the buried ferrous metallic items cannot be determined from the geophysical data alone; however, given the site's history of military training and the quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond. Many of the anomalies are expected to have been created by cultural features whose specific information is not known in order to allow them to be associated with identified anomalies.

12.16 UPDATED CONCEPTUAL SITE MODEL

The conceptual site model was outlined in the UFP SAP as follows: "Historical evidence indicates that MEC was identified and scattered throughout the Valley Impact Area. Therefore, potentially complete pathways exist for human and ecological receptors for MEC in surface and subsurface soil. This includes receptors for hand/tread underfoot contact and surface intrusive work that may be conducted at the Valley Impact Area. These activities include, but are not limited to, excavation, plowing, tilling, construction, and environmental sampling for human receptors. Ecological receptors may come in contact with MEC through burrowing, nesting or feeding activities that disturb surface soil. Trespassers are anticipated to be exposed via non-intrusive surface soil activities at the site, but it is unlikely they would be exposed to subsurface soil through intrusive activities."

A three dimensional depiction of the CSM is presented as Figure 12-4. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil, soil, and sediment. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses. Only MC associated with the Valley Impact Area are considered in the CSM exposure pathway analysis.

12.17 EXPOSURE PATHWAY ANALYSES

An Exposure Pathway Analysis for MEC is presented as Figure 12-5. No MC sampling was conducted for the Valley Impact Area, therefore an MC Exposure Pathway Analysis was not performed.

Three MEC and 15 suspect MPPEH items were discovered during detector-aided surface surveys of the Valley Impact Area. One hundred ninety-seven subsurface geophysical anomalies were identified. Exposure to surface soil, subsurface soil, and surface water/sediment containing MEC present complete exposure pathways for human and ecological receptors. All human and ecological receptors have complete exposure pathways for direct contact with MC in surface soil, which includes dermal contact, ingestion, and inhalation (dust). Runoff, discharges, and/or erosion may transport MEC from surface soil to surface water/sediment. Precipitation infiltration may provide for contaminant mobility into the subsurface soil and into the shallow surficial aquifer, which is assumed to be connected to nearby surface water bodies. Because the Valley Impact Area is located within a hunting area, human and ecological receptors have a complete exposure pathway by ingesting game/prey that have consumed contaminated vegetation or prey. Complete exposure pathways exist for MC in subsurface soil (direct contact, ingestion, and inhalation during intrusive work activities) for all human and ecological receptors except the trespasser. It is not anticipated that trespassers would come in contact with subsurface soil. Although confining layers are expected to prevent the migration of MC to the lower aquifers used for water supplies, potentially complete exposure pathways exist for MC in shallow groundwater for human receptors.

The CSM indicated that complete exposure pathways existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist.

12.18 CONCLUSIONS

Three MEC and 15 suspect MPPEH items were discovered during detector-aided surface surveys of the Valley Impact Area. One hundred ninety-seven subsurface geophysical anomalies were identified. Although the items are scattered around the site, many tend to be located in clusters. The nature of the buried ferrous metallic items cannot be determined from the geophysical data alone; however, given the site's history of military training and the quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond. Many of the anomalies are expected to have been created by cultural features, which lack specific information in order to allow the features to be associated with identified anomalies.

12.19 RECOMMENDATIONS

12.20 RECOMMENDATIONS FOR NEXT PHASE

The presence of 197 subsurface anomalies indicates the possibility that munitions-related material may be present at the Valley Impact Area (UXO-26). Clusters were identified, randomly throughout the site. The nature of these buried metallic items cannot be determined from the geophysical data, and can only be characterized through intrusive investigation. Based on these results, a more extensive evaluation, in the form of an RI, is recommended for UXO-26. The scope of effort for the RI, which will include further characterization, delineation, and intrusive investigations, will be determined during project planning.

MEC

Proceed to an RI. The RI should include:

- Clearance of surface MEC/MPPEH and non-munition debris.
- Subsurface geophysical investigation.
- Investigation of representative subset of subsurface anomaly discovered during the geophysical investigation.

MC

- No further action is recommended, however MC sampling if subsurface MEC/MPPEH are found.

TABLE 12-1

MUNITION TYPES AND CHEMICALS
VALLEY IMPACT AREA - UXO 26
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MUNITIONS TYPES USED/STORED AT THE FACILITY	ASSOCIATED CHEMICAL CONSTITUENTS
Black powder	Blackpowder (potassium nitrate, sulphur, charcoal or coal, nitrocellulose)
Brown prismatic powder	prismatic grain shape substittute for black powder
Shell powder	Composition B (59/40/1/ mixture of RDX, TNT and beeswax). Composition D (TNT and RDX).
Smokeless powder	Propellants (ex. Nitrocellulose), Deterrents (ex. Dibutyl phthalate), Stabilizers (ex. Calcium carbonate), Flash reducers (ex. potassium sulfate), Additives (ex. Wax)
Wet gun cotton	HMX (Octogen: a powerful and relatively insensitive nitroamine high explosive, chemically related to RDX)
emmensite	potassium picrate
Joveite	potassium picrate
Randite	calcite and beta-uranotile with some tvuvamunite.
Perchlorates	Salts derived from perchloric acid (HClO4)

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 12-2

VALLEY IMPACT AREA
MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

FACILITY	Stump Neck Annex of Indian Head MD
SITE NUMBER & NAME	112G00810 MMRP Site Investigation

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition			Notifications Completed (indicate w/ √ as applicable)	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
01/05/2010	1051	VIA T-19	VIA-T19-01		X		322500.10	1246507.53	Submunition, BLU-3	Color code is mixed, yellow			01/05/2010	X	VIA-T19-01
01/05/2010	1049	VIA T-19	VIA-T19-02			X	322445.48	1246473.15	Projectile, 105mm	Unfired, rusted, empty			01/05/2010	X	VIA-T19-02
01/05/2010	1111	VIA T-14	VIA-T14-03		X		321392.42	1244767.42	Submunition, BLU-7	Aluminum, roots have			01/05/2010	X	VIA-T14-03
01/05/2010	1126	VIA T-14	VIA-T14-04			X	321218.40	1245028.11	Bomb fuze arming vane	Rusted, partial			01/05/2010	X	VIA-T14-04
01/05/2010	1124	VIA T-14	VIA-T14-05			X	321208.01	1245032.69	Bomb fuze arming vane	Rusted, partial			01/05/2010	X	VIA-T14-05
01/05/2010	1121	VIA T-14	VIA-T14-06			X	321196.12	1245049.60	Bomb fuze arming vane	Rusted, partial			01/05/2010	X	VIA-T14-06
01/05/2010	1137	VIA T-14	VIA-T14-07			X	321201.55	1245056.72	Bomb fuze	Rusted, partial			01/05/2010	X	VIA-T14-07
01/07/2010	1341	VIA T-15	VIA-T15-08	X			321420.52	1245389.61	SUU-14 dispenser	Rusted, still contains			01/07/2010	X	VIA-T15-08
01/08/2010	1615	VIA T-10	VIA T10-09			X	320031.75	1243840.99	MK 81 bomb part	Rusted,			01/08/2010	X	VIA-T10-09
01/08/2010	1617	VIA T-10	VIA T10-10			X	320031.75	1243840.99	MK 81 practice bomb	Rusted, blue			01/08/2010	X	VIA-T10-10
01/08/2010	1619	VIA T-10	VIA T10-11			X	320031.75	1243840.99	8” projectile	Empty, rusty, no fuze, unfired			01/08/2010	X	VIA-T10-11
01/08/2010	1620	VIA T-10	VIA T10-12			X	320031.75	1243840.99	8” projectile	Empty, rusty, no fuze, unfired			01/08/2010	X	VIA-T10-12
01/08/2010	1621	VIA T-10	VIA T10-13			X	320031.75	1243840.99	8” projectile	Empty, rusty, no fuze, unfired			01/08/2010	X	VIA-T10-13
01/08/2010	1507	VIA T-06	VIA T06-14			X	318609.35	1242920.09	old style bomb	Rusted, partial			01/08/2010	X	VIA-T06-14
01/08/2010	1512	VIA T-06	VIA T06-15			X	318609.35	1242920.09	old style bomb	Rusted, partial			01/08/2010	X	VIA-T06-15
01/09/2010	1552	VIA T-07	VIA T07-16			X	319340.06	1242802.11	M-100 series bomb fuze	Rusted, partial fuze			01/09/2010	X	VIA-T07-16
01/09/2010	1557	VIA T-07	VIA T07-17			X	319351.52	1242787.69	M-100 series bomb fuze	Rusted, partial fuze			01/09/2010	X	VIA-T07-17

TABLE 12-3

MC SAMPLING PROGRAM
VALLEY IMPACT AREA - UXO 26
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

No Sampling Proposed

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD\SN_VALLEY_IMPACT_MEC.MXD 4/16/10 KM

1242000 1244000 1246000 1248000 1250000 1252000

322000

320000

318000

N

NOTE: Several MRP Sites on Stump Neck peninsula are within the perimeter of Valley Impact Area, but those areas will be addressed as part of the SI process for those other MRP sites.

UXO Detector-Aided Sweep and Geophysical Transects (400-foot spacing)

Legend

- MRP Site Not Included in Site Inspection
- MRP Site Boundary for Valley Impact Area
- MRP Area Boundary Identified During PA
- Installation Boundary
- Wetland
- Topographic Contour (5-ft)

Aerial Photo: 2003 DOQ
NAD 1983 SP Maryland (coordinates in feet)

800 400 0 800
Feet

DRAWN BY	DATE
K. MOORE	8/24/07
CHECKED BY	DATE
E. BERKLITE	4/16/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

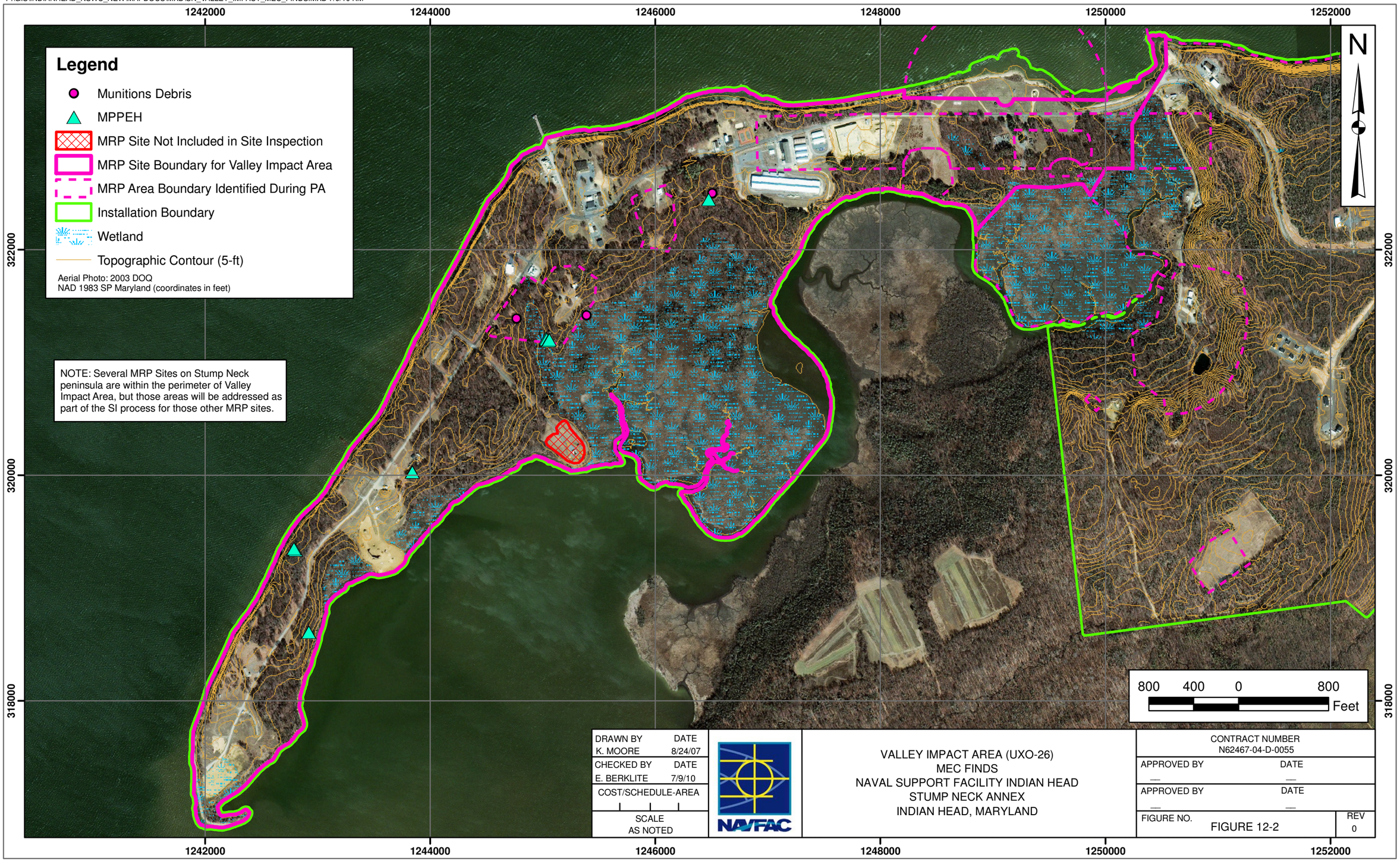
NAVFAC

VALLEY IMPACT AREA (UXO-26)
MEC INVESTIGATION LOCATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 12-1	0

1242000 1244000 1246000 1248000 1250000 1252000

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD\SN_VALLEY_IMPACT_MEC_FINDS.MXD 7/9/10 KM



DRAWN BY	DATE
K. MOORE	8/24/07
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

VALLEY IMPACT AREA (UXO-26)
MEC FINDS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 12-2	0

P:\GIS\INDIANHEAD_NSWC_NEW\MAPDOCS\MXD\SN_VALL/EY_IMPACT_GEOPHYSICS.MXD 7/12/10 KM

1242000 1244000 1246000 1248000 1250000 1252000

322000 320000 318000

Legend

- Buried Ferrous Metallic Items (with unique identifier) 197 Anomalies Identified
- Surface Metals (non-muntions related)
- MRP Site Not Included in Site Inspection
- MRP Site Boundary for Valley Impact Area
- MRP Area Boundary Identified During PA
- Installation Boundary
- Wetland
- Topographic Contour (5-ft)

Aerial Photo: 2003 DOQ
NAD 1983 SP Maryland (coordinates in feet)

NOTE: Several MRP Sites on Stump Neck peninsula are within the perimeter of Valley Impact Area, but those areas will be addressed as part of the SI process for those other MRP sites.

CWAP Indicates Possible Utilities

CWAP Indicates Training Area

CWAP Indicates Possible Utilities

Active Range

N

57 54 51 48 45 42 38 35 32 29 26 23 20 17 14 11 8 5 2 -2 -5 -8 -11 -14 -17 -20 -23 -26 -29 -32 -35 -38 -42 -45 -48 -51 -54 -57

Vertical Magnetic Gradient
(nanoteslas per two feet)

NOTE: Geometrics G-858G data shown

800 400 0 800
Feet

DRAWN BY K. MOORE	DATE 8/24/07
CHECKED BY J. COFFMAN	DATE 7/12/10
COST/SCHEDULE-AREA	
SCALE AS NOTED	

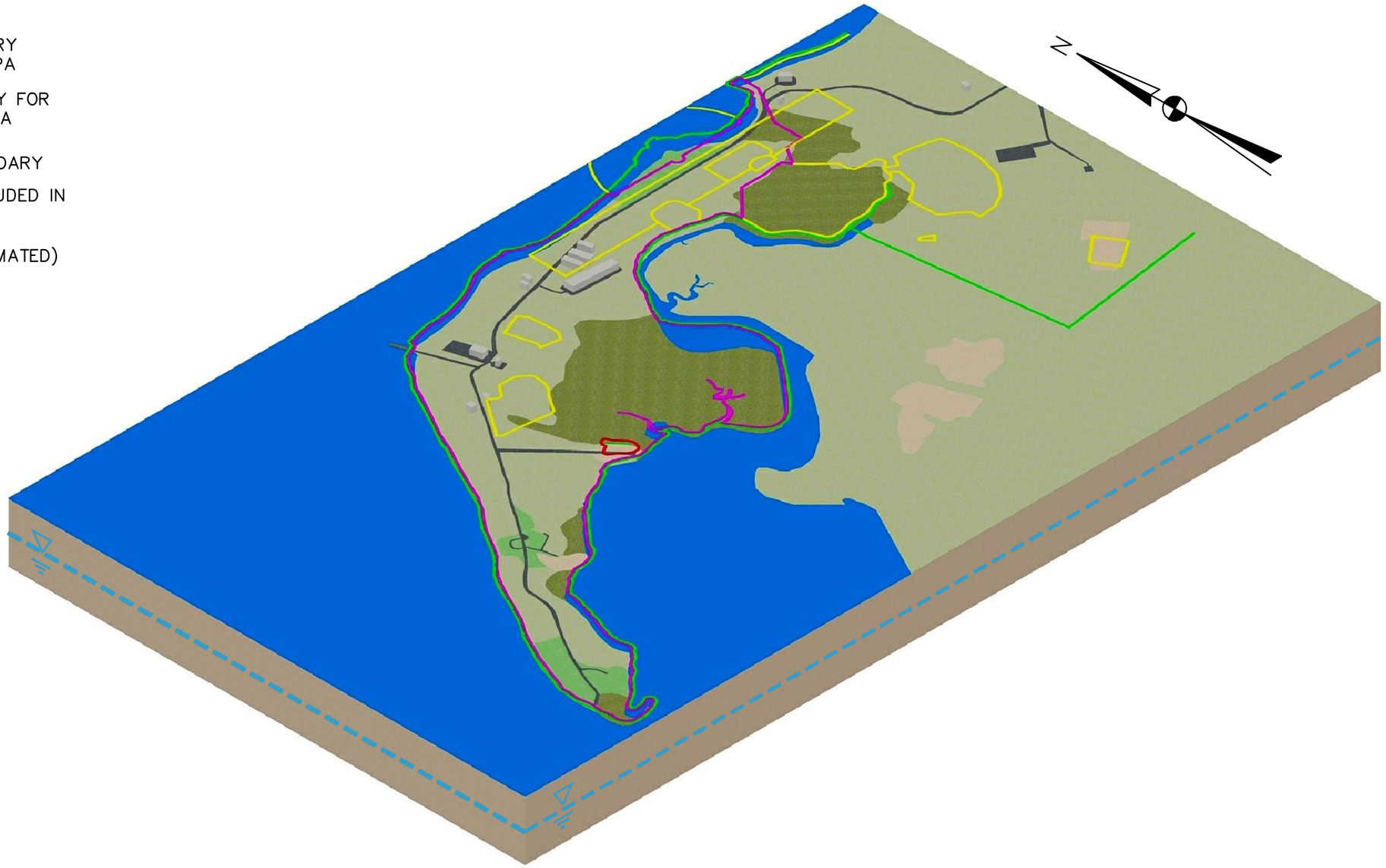
NAVFAC

VALLEY IMPACT AREA (UXO-26)
GEOPHYSICAL ANOMALIES LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER N62467-04-D-0055	
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 12-3	REV 0

LEGEND

- MRP AREA BOUNDARY IDENTIFIED DURING PA
- MRP SITE BOUNDARY FOR VALLEY IMPACT AREA
- INSTALLATION BOUNDARY
- MRP SITE NOT INCLUDED IN SITE INSPECTION
- WATER TABLE (ESTIMATED)
- BUILDINGS
- GRASS
- WETLANDS
- FOREST
- SOIL
- PAVED ROAD
- WATER



DRAWN BY ND DATE 6-14-10	NAVFAC	VALLEY IMPACT AREA UXO-26 CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND	CONTRACT NO. 0810
CHECKED BY DATE			OWNER NO.
REVISED BY DATE			APPROVED BY DATE
SCALE NOT TO SCALE			DRAWING NO. FIGURE 12-4 / REV. 0

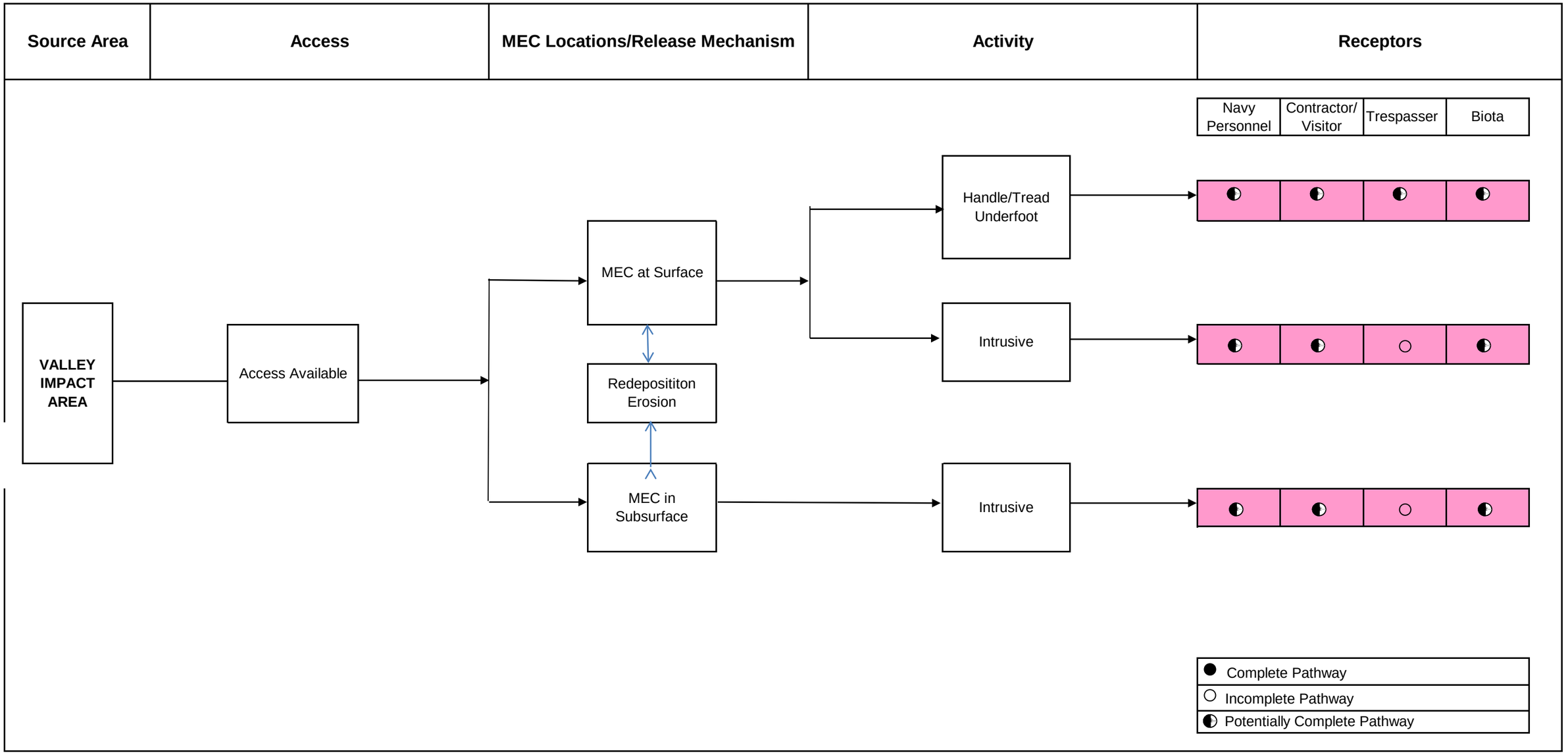
R:\0810\CSM\0810CSM011.dwg PIT NICHOLE.DILLA 6/30/2010 2:13:50 PM

FIGURE 12-5

MEC EXPOSURE PATHWAY ANALYSIS

VALLEY IMPACT AREA UXO 26

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



13.0 EOD SCHOOL DEMOLITION AREA – UXO-28

13.1 LOCATION AND SETTING

The EOD School Demolition Area occupies approximately 5 acres on Stump Neck Annex within the boundaries of the Marine Rifle Range and partially within the boundaries of the Torpedo Burial Site. The EOD School Demolition Area consists of an open field, mowed grass areas, and unused wooded areas. The entrance gate (Bldg. 10-SN) in 1945 was located east of the causeway, near the intersection of Roach Road and Archer Avenue.

EOD-1. Current Site Conditions of the EOD School Demolition Area

13.2 CURRENT LAND USE AND ANTICIPATED FUTURE LAND USE

A number of buildings [including Buildings 2019 (Influence Mine Test), 2075 (Ballistic Motor Shed), 2101 (Vehicle Shelter), 2156, and D-21CSN], and a former ready bunker area are located within the EOD School Demolition Area. Buildings 2012 and 2174 are located across from Archer Avenue, to the north and northwest of the EOD School Demolition Area, respectively. Utilities within the EOD School

Demolition Area include potable water on the western side and sanitary sewer toward the center of the range. Electric utilities are located outside the northwestern corner of the range. During its use as the EOD School Demolition Area, the range was an open field. The EOD School Demolition Area is located within an upland hunting area according to the 2003-2004 Stump Neck Annex Hunting Map.

13.3 TOPOGRAPHY

The topography is relatively flat and elevations range from 5 to 10 feet above msl.

13.4 GEOLOGY

Site-specific geology was classified for the EOD School Demolition Area during this SI's shallow surface boring investigation. The geology observed during boring installation consisted of clayey and sandy silt. Some borings contained pieces of asphalt gravel. No groundwater or waste material was encountered during the shallow surface investigation. Soil and sediment log sheets are included in Appendix F.10. Boring logs are included in Appendix F.1.

13.5 SOIL AND VEGETATION

The EOD School Demolition Area is located in a hardwood forest area, with wetland areas nearby to the south, east, and west. According to the Soil Survey of Charles County (USDA, 1974), the soil at the EOD School Demolition Area is classified as Mattapex silt loam with 0 to 2 percent slopes.

13.6 HYDROLOGY

Surface runoff is in the direction of Chicamuxen Creek towards the southwest.

13.7 HYDROGEOLOGY

There is no range-specific hydrogeologic information for the EOD School Demolition Area; however, groundwater is anticipated to be within 10 feet of ground surface and flow is expected to be towards Chicamuxen Creek in the southwest.

13.8 WETLANDS

There are no known wetlands at EOD School Demolition Areas, but wetlands are located beyond the area to the east, west, and south.

13.9 CULTURAL AND ARCHAEOLOGICAL RESOURCES

The 1996 Phase I Cultural Resources Survey of Stump Neck Annex and Supplemental Architectural Investigations identified one site within the EOD School Demolition Area. Endangered and special status species are reported to exist at Stump Neck Annex, and thus have the potential to inhabit the EOD School Demolition Area.

13.10 HISTORICAL INFORMATION

The EOD School Demolition Area is within the estimated firing fan of the Valley Impact Area; however, no MEC was observed during the visual site survey in 2003. The EOD School Demolition Area was used from 1944 to 1949, and supported the introduction of Indian Head EOD School graduates to live explosives. The introduced materials included blocks of TNT, tetryl packs, caps, primer cord, safety fuses, and shaped charges. Students would demonstrate the use of these explosives to shear rails and trees, blow holes in the ground, and split live bombs in situ using shaped charges. As a result of the training activities, MEC are suspected to be present over the entire area.

13.11 MUNITIONS USED

This section describes the munitions and munitions-related materials known or suspected to be at the range, including the types and estimated maximum penetration depths. This includes both MEC and nonhazardous munitions-related debris (e.g., fragmentation, base plates, inert mortar fins). Potential ordnance concentration areas are presented along with a discussion on the presence of any special consideration ordnance. Based on historical documents and information obtained during the data collection process, it is expected that TNT, Tetryl packs, shape charges, caps, primer cords, safety fuses, 100-pound bombs, and other live bombs were used at the EOD School Demolition Area. The EOD School Demolition Area is overlapped by the firing fan from the Valley located at the Main Installation. Thus, there is a potential for munitions associated with the Valley to be present at the EOD School Demolition Area. Based on the information obtained during the data collection process, the EOD School Demolition Area is not suspected to contain CWM-filled munitions, electrically fuzed munitions, or DU-associated munitions.

The munitions used and/or stored at the facility and the associated chemical constituents are listed in Table 13-1.

13.12 MUNITIONS CONSTITUENTS

Munitions constituents potentially present at the EOD School Demolition Area include metals, TNT (2,4,6-trinitrotoluene), explosive residuals, Tetryl, white phosphorous, blackpowder (potassium nitrate, sulphur, charcoal or coal, nitrocellulose), chloroform, and BEHP.

13.13 MEC SITE FIELDWORK

13.13.1 Background

The EOD School Demolition Area was used from 1944 to 1949 as a training area to introduce graduating students to live explosives. Previous investigations indicated that MEC may remain at the EOD School Demolition Area. Therefore, Tetra Tech conducted a focused UXO detector-aided sweep (100-percent survey coverage) within a 100- by 200-foot grid across the former ready bunker area (the only range structure present), and conducted a geophysical investigation of this former ready bunker area using 5-foot line spacing. The PA indicated that the site consists of 4.64 acres (Figure 13-1), and hence UXO detector-aided and geophysical surveys were conducted on 50-foot-spaced transects to reconnoiter the remainder of the site. Each transect covered a 3-foot wide swath.

The current MEC site investigation at the EOD School Demolition Area was limited to detector-aided surface and subsurface geophysical investigations.

The initial horizontal boundary for the MEC investigation was the boundary of the EOD School Demolition Area as shown on Figure 13-1.

The initial vertical boundary for the MEC investigation (detector-aided surface sweeps and geophysical data) was 4 feet bgs within the land area. Site activities included usage of explosive charges which created blow holes which may have been 4 feet deep. The site is overlapped by the firing fan from the Valley Impact Area located on the Main Installation; therefore, there is the potential for munitions associated with the Valley to be present in the soil. Information from this investigation was also considered in the assessment of impacts from munitions fired from the Valley.

13.13.2 Scope

The scope of survey activities at the EOD School Demolition Area is summarized below (see Figure 13-1).

- Brush and vegetation clearing was necessary to support the detector-aided surface sweeps and geophysical investigation.

- UXO detector-aided surface survey providing 100-percent coverage across a 100- by 200-foot grid across the former ready bunker area, and detector-aided surface survey with 50-foot-spaced transects for the remainder of the 5-acre site (boundary established based on PA).

- Geophysical surveying with no greater than a planned 5-foot survey line spacing across a 100- by 200-foot grid across the ready bunker area, and with 50-foot-spaced transects for the remainder of the 5-acre site (boundary established on PA).

- If suspect MEC or subsurface anomaly clusters were detected along the 50-foot-spaced transects, additional detector-aided or geophysical investigations of these areas were conducted to further determine the extent of possible MEC. Investigation was limited to no greater than 100 feet beyond the planned survey boundary and was determined by a field decision involving the UXO team leader and geophysics team. Notification was given to the UXO Manager and PM prior to starting the abovementioned additional investigation.

- Consulting with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with separate MC UFP SAP).

The UXO team leader reported all suspect MEC items to the NSF-IH IR Coordinator and then to the Tetra Tech UXO Manager. Suspect MEC items left in place were avoided during subsequent geophysical surveying. No MEC items were moved or disturbed during this phase of the project. Surface MD were reported on the log sheets or in the logbook for the site.

13.13.3 Site Preparation

Vegetation clearing activities in the EOD School Demolition Area began by cutting the majority of the 100- by 200-foot grid around the Former Ready Bunker using a skid steer brush hog. The outer extremes of this area were cut by hand using weed-eaters and chainsaws because of thick vegetation and terrain restrictions. Prior to skid steer cutting operations, stakes were placed to mark the boundaries of the survey area and a visual UXO survey was conducted to identify ground surface ordnance debris for the skid steer to avoid. Transects were installed in the remaining areas. All transects ran through areas that consisted of large trees and thick vegetation and hence, were cut by hand using weed-eaters and chainsaws. Stakes were placed at each end of the transect lines, and a

GPS unit was used to create a path. Transects were then cut along the path as straight as possible avoiding trees over 2 inches in diameter.

13.13.4 UXO Detector-Aided Surface Sweep

The criterion for the detector-aided surface sweeps was a go/no-go test performed by determining whether the instrument responded to metallic objects under a blanket (blanket test). Details of the performance criterion for the blanket test are provided in Appendix A – SOP OPS 1.

MEC detector-aided surface survey activities at the EOD School Demolition Area included 100 percent coverage of the Former Ready Bunker Area. Outside of the Former Ready Bunker Area, transects running north-south covered the remainder of the site; the transect lanes were 3 feet in width and spaced 50 feet apart. In total, there were 14 planned and surveyed transects.

Detector-aided surface sweeps of the established survey areas were conducted as shown on Figure 13-1. A grid, 100 by 200 feet, across the former ready bunker area, was established and received 100 percent survey coverage. Sweeps, at 5-foot spaced transects were conducted for the remainder of the area. A 100 percent detector-aided surface sweep was also conducted of accessible areas within 50 feet of any anomaly clusters identified along transects during detector-aided surface sweeps, and during the subsurface geophysics investigation. The UXO Team conducted a visual and detector-aided surface sweep of the selected area where the subsequent geophysical investigation was to be conducted. A Schonstedt GA-52Cx metal detector and White's XLT all-metals detector were used to aid in locating surface metal and debris in the Former Ready Bunker Area. Only the Schonstedt GA-52Cx was used to survey the 14 transects spaced throughout the site. The White's XLT was not employed on the 14 transects because of the high number of ferrous metal items located on the surface, and low number of non-ferrous items on the surface of the 100 percent-coverage Additionally, visual surveys of the transect area did not give any indication of non-ferrous MPPEH. Areas of standing water, ankle and knee deep, were encountered on site; these areas were avoided during the surface sweeps.

Grid nodes were staked in the field using a GPS unit. In clear areas (minimal tree canopy) stakes were placed every 5 feet on the opposite intervals (east – west), and ropes were stretched from one side to the other to establish 5-foot wide lanes. In heavily vegetated areas, where stretching of ropes was not feasible, technicians walked side-by-side at 5–foot intervals. The general UXO detector-aided survey was conducted as described in Section 3a.3. Locations where visual observations of suspect MEC, MPPEH, MD or subsurface anomalies were observed were marked with a stake. Pictures were taken of items observed on the surface. In clear areas, the locations were recorded using a GPS. In areas where

tree canopy precluded use of a GPS, locations were established using a tape measure and compass measurements from a known location(s). All suspect MEC items were recorded following the requirements of the UFP SAP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures. The MEC hazard assessment methodology is described in Section 3a.5. MEC documentation is described in Section 3a.7.

13.13.5 Geophysical Survey

A Geonics EM61-MK2 and Geometrics G-858G magnetometer were used at this site to locate suspect metal objects in subsurface soil. Suspect MEC, MPPEH, MD and subsurface metals (if metals are MEC, MPPEH, or MD) could potentially result in the release of MC.

A survey of the 100- by 200-foot grid across the former ready bunker area was conducted with a 5-foot line spacing using both instruments. Field conditions near the southern edge of the grid (i.e., brush, logs) created some minor irregularity in the survey line coverage. A survey at 50-foot spaced transects for the remainder of the site was conducted. A 5-foot spaced survey of accessible portions of one additional area, specified by the UXO team because of a surface discovery of MD, was added to the original survey and was performed with the magnetometer because of its portability in this wooded area.

Before the geophysical surveys began, the UXO team conducted a visual and detector-aided surface sweep of the survey area. Any suspect MEC found during the surface sweep was flagged by the UXO team and reported, and the geophysical survey team avoided these areas.

13.14 DEVIATIONS FROM WORK PLAN

No deviations from the Work Plan occurred during the survey of the EOD School Demolition Area.

13.15 MEC SURVEY RESULTS

The Field Forms are included in Appendix C. The UXO Surface Survey Activities are summarized below from the daily and weekly logs at the EOD School Demolition Area.

On November 16 through 18, 2009, the boundaries were set at the EOD School Demolition Area and all 14 transects were skid steer brush cut.

13.15.1 UXO Detector-Aided Surface Survey Results

The EOD School Demolition Area was investigated on November 17 through 21, 2009. The following MEC items were discovered:

- On November 17, 2009, the Schonstedt sweep of the 100 percent-coverage section at the EOD School Demolition Area was completed. One non-ferrous metal Munitions Debris item was located, which was part of a nose fuze. It was recorded for reporting purposes as ESDA-01.

- On November 18, 2009, the UXO Team completed sweeps with the Schonstedt of transects 1 through 14 in the EOD School Demolition Area. The White's XLT sweep of the 100 percent-coverage area was also completed. The White's XLT was not used to sweep transects 1 through 14 because of the high number of ferrous metal items located on the surface, and the low number of non ferrous items on the surface of the 100 percent-coverage area. Most non-ferrous anomalies on the surface were aluminum soda cans. One-ferrous metal Munitions Debris item which was part of a German bomb fuze assembly was located in the 100 percent- coverage area. It was recorded for reporting purposes as ESDA-02.

- On January 21, 2010, while supporting MC sampling, the UXO team 3 visually located a large fragment of a 500-pound old style bomb just outside of the EOD School Demolition Area boundary. It was recorded for reporting purposes as ESDA-03.

In summary, two suspect MPPEH items were discovered during detector-aided surface sweeps of the EOD Demolition Area, and one during the MC sampling activities (Table ES-2). The first two items, an aluminum fuze casing and German bomb fuze, were discovered in the 100 percent coverage area. The fuze casing was empty and dented, and the bomb fuze was rusted out with a hole in the buster charge revealing no explosive content. The 500-pound old style bomb was found just outside of the EOD School Demolition Area boundary.

Pictures of the items were taken and logged; the GPS locations were also recorded. No notifications were made since the items were identified as munitions debris.

Locations of the surface munitions debris items are shown on Figure 13-2. Table 13-2 presents a summary of the MPPEH items identified at EOD School Demolition Area, and Appendix D presents photographs of the items discovered during the detector-aided surface sweeps and during the MC sampling.

13.15.2 Geophysical Survey Results

Figures 13-3 and 13-3A display the interpretation of the site data. Anomalies auto-selected (picked) using the Blakely Test from the UX-Detect module of Geosoft are shown by "+" symbols with a number identifier, and are identified as buried metallic items. Fifty-seven items were picked in the former ready bunker area grid from the EM61 data, and their locations are shown on Figure 13-3 with their corresponding georeferenced coordinates listed separately in Appendix E Table 13-3. One hundred ten items were picked (analytic signal values of 50 and above were picked) using the Blakely Test in the UX-Detect module of Geosoft across the surveyed area from the magnetometer data. These picks are

shown on Figure 13-3A and listed in Appendix E Table 13-3A. One of the transects labeled on Figure 13-3A had a high concentration of anomalies which may be attributed to the transect being positioned over or near a metallic utility line. The picked items are scattered around the site, but many tend to be located in clusters. The nature of the buried metallic items cannot be determined from the geophysical data alone; however, given the site's history of military training and the large quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond. Some anomalies are on the edge of the survey area, potentially needing further delineation.

Aboveground objects displayed in the legend as surface metals (non-munitions related) appear in several locations to have created data anomalies. The presence or absence of additional items (and potential targets) in these areas cannot be determined from the geophysical data alone.

13.16 MC SAMPLING PROGRAM

Information from the detector-aided surface sweep and geophysical survey about the presence of MD and shallow subsurface anomalies was utilized to identify surface and subsurface MC soil sampling locations, and to determine if contamination exists. Tetra Tech consulted with the Navy and stakeholders to discuss results and establish SI sampling locations for MC (in accordance with the separate UFP SAP). A total of 40 soil samples were collected at 20 soil sampling locations at the EOD School Demolition Area. Table 13-3 lists the sampling locations and the justification for selecting the locations.

If no suspect MEC, MPPEH, or subsurface anomaly clusters were observed, the samples were collected at the UFP SAP proposed locations. Figure 13-4 illustrates the sampling locations in conjunction with the MEC detector-aided surface sweep and geophysical investigation findings at the EOD School Demolition Area. All soil samples were collected via hand auger and submitted to the fixed-base laboratory for explosives and metals analyses. Three of the soil samples shipped to the laboratory were identified for pH, TOC, and CEC analysis.

The CSM (detailed in Appendix B of Volume I of the UFP SAP) indicated that potentially complete exposure pathways existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC may exist. The updated CSM is included in Section 13.25.

13.16.1 MC Sample Collection and Analysis

Soil sample locations were selected based on a bias towards areas that were believed to be most likely contaminated by past operations at the site. The total area of the site is 4.64 acres as indicated in Table ES-1. See Figure 13-4 for all sample locations. Prior to initiating sample collection, all sample locations were marked by colored pin flags bearing the sample location ID number. Collected sample locations identified in the approved UFP SAP were located by GPS and by measurements from stationary objects (e.g., roadways, existing buildings). All sample locations were collected as proposed in the approved UFP SAP.

1) **Surface Soil**

   a) Forty composite surface soil samples were collected from two depths (0 to 6 and 0 to 24 inches bgs) at each of the 20 sample locations. The 0- to 6-inch bgs interval is of interest for ecological risk screening while the 0- to 24-inch bgs interval is of interest for the human health risk screening. Surface soil samples at each location sampled were composites of seven discrete samples collected using the seven-point wheel approach. Explosives present on the surface would have resulted from low order detonations which released particles of explosives. These particles would be heterogeneously distributed in surface soil. In order to form a composite in which explosives would be evenly dispersed, the entire composite was processed in the laboratory using the methodology described in Appendix A of SW-846 Method 8330B. This methodology consists of air drying and sieving the entire sample and conducting particle size reduction (grinding) of the entire sample. Surface soil samples were also analyzed for metals using SW 846 Method 6010B/6020A.

   b) Surface soil samples were collected via hand auger.

2) Two duplicate surface soil samples were collected.

Anomaly avoidance techniques were practiced during all sampling operations. Soil sample log sheets are included in Appendix F of this document.

13.17 WORK PLAN DEVIATIONS

There were no deviations from the work plan.

13.18 SITE INSPECTION DATA COLLECTION RESULTS

13.18.1 MC Sampling Results

All soil samples collected were compared to the PALs and background sampling results, and a statistical evaluation was done to compare the background data with the site sampling results. The summary tables of the site background screening and PALs are presented in Appendix H and the MC analytical results are also presented in Appendix H. The data validation reports are presented in Appendix I. The statistical summary and calculations are presented in Appendix J. Table 13-4 summarizes the results as compared to the calculated screening values for explosives and metals in surface soil. The PAL was the reference limit, unless the background and screening calculations exceeded this value. In Table 13-4, if a parameter had an exceedance of the PAL and background screening values at any sampling point, the parameter is highlighted; individual sample exceedances are also highlighted.

13.19 DATA PRESENTATION/DATA USABILITY

13.19.1 Data Quality Review of Samples at the EOD School Demolition Area

This section contains a description of the data review processes used to determine whether analytical laboratory data collected during the sampling field effort for the EOD School Demolition Area were of acceptable quality for use in decision-making. The review began with data validation, which is a comparison of DQIs against the prescribed acceptance criteria. The DQIs are measures used to assess the completeness, sensitivity, accuracy, precision, comparability, and representativeness of the sample collection and sample analysis process. The output of this review was a set of alphabetic flags such as “U,” “J,” “R,” “L,” “K,” or combinations thereof, assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data and if data quality meets the DQOs of the project. The DQOs presented in the Munitions Response Program Site Inspections at Ten Munitions Response Program Ranges QAPP (September 2009) were maintained through the course of the sampling event. The Worksheets #19 and #15 of the QAPP present the analytical methods and compounds analyzed.

Table 10A in Appendix I presents the rejected data for EOD School Demolition Area samples. The laboratory control sample percent recovery for tetryl was less than 10 percent. The low LCS recovery resulted in the rejection of 19 out of 42 nondetected tetryl results. These 19 tetryl results are considered unusable. Table 10B in Appendix I presents all the qualified data and the reason for the data qualification. All data for samples collected at the EOD School Demolition Area, except for 19 tetryl results, are considered valid for their intended purposes.

Nineteen out of 714 explosive results were rejected because of a low LCS or matrix spike recovery. The laboratory completeness is 97.3 percent. The sample collection completeness is 100 percent.

The laboratory reported nondetected results down to the laboratory MDL) for arsenic and selenium, which did meet the PQLGs. The laboratory MDL for tin also met the PQLG for nondetected results; however, four (X28SS0010006, X28SS0080024, X28SS0180024, and X28SS0200024) sample results were diluted because of possible matrix interference, which increased the nondetected reporting limits for tin in samples X28SS0010006, X28SS0080024, X28SS0180024, and X28SS0200024. The nondetected explosive results for compounds 1,3-dinitrobenzene; 2,4-dinitrotoluene; 2,6-dinitrotoluene; 2,4,6-trinitrotoluene; and RDX exceeded the PALs for sample X28SS0010006 because of a dilution for a possible matrix interference. There are instances where the non-detected sample results exceeded the PQLGs because the laboratory did not use enough sample volume. The exceedances of the project PALs for five of 42 samples will not affect the overall analytical sensitivity.

Table 10A in Appendix I shows that 19 tetryl results were rejected because of a LCS or matrix spike recovery less than 10 percent. There is a low bias for the tetryl results in the individual associated samples. The noncompliances listed in Table 10B in Appendix I show multiple qualifications for matrix spike recovery, LCS recovery, ICP interference, and percent difference between column noncompliances. Data qualified with “K” and “L” qualifiers indicate a high or low directional bias, respectively. There were no quality control deficiencies noted for field accuracy.

All results for copper were qualified because of a field duplicate precision noncompliance. The field duplicate pair for sample X28SS0050006 had results for calcium, copper, iron, lead, lithium, magnesium, nickel, potassium, and vanadium qualified because of a field duplicate precision noncompliance. The field duplicate imprecision for sample X28SS0050006 indicates a lack of matrix homogeneity. Overall, the field and laboratory precision was acceptable and no data were rejected.

No comparability issues were noted during the data validation process.

Based on field logs indicating the conditions during sample collection and laboratory audits, all reported data are adequately representative of site conditions and intended populations.

13.20 DATA COMPARISON TO PROJECT ACTION LIMITS

Forty surface soil samples (0- to 6-inch and 0- to 24-inch bgs) were sent to the FBL for explosives analyses using SW 846 Method 8330B and metals analyses (SW 846 Method 6010B/6020A).

13.20.1 Surface Soil

Table 13-4 summarizes the results as compared to the calculated screening values for explosives and metals in surface soil. Figure 13-5 illustrates the locations of the surface soil exceedances.

The PALs were not exceeded for explosive constituents. Nitroglycerin was detected, but the PAL was not exceeded, at two sampling locations. In addition, RDX was detected, but the PAL was not exceeded, at one location.

The PAL and background 95% UTL values were exceeded for eight metals constituents:

- Antimony exceeded the PAL of 0.27 mg/kg (no background 95 percent UTL value) at six composite surface soil sampling locations, ranging from 0.37 (L) mg/kg to 2.3 (L) mg/kg.

- Chromium exceeded the PAL of 26 mg/kg and background 95 percent UTL value of 33.4 mg/kg at three composite surface soil sampling locations, ranging from 35 mg/kg to 40 mg/kg.

- Copper exceeded the PAL of 28 mg/kg and background 95 percent UTL value of 20.3 mg/kg at nine composite surface soil sampling locations, ranging from concentrations of 29 (J) mg/kg to 54.7 (J) mg/kg.

- Lead exceeded the PAL of 11 mg/kg and background 95 percent UTL value of 62.5 mg/kg at five composite surface soil sampling locations, ranging from concentrations of 78 mg/kg to 198 mg/kg.

- Magnesium exceeded the PAL of 4400 mg/kg and background 95 percent UTL value of 1620 mg/kg at one composite surface soil sampling location: X28SS0030006 at a concentration of 7480 mg/kg.

- Mercury exceeded the PAL of 0.058 mg/kg and background 95 percent UTL value of 0.16 mg/kg at two composite surface soil sampling locations: X28SS0180006 at a concentration 0.85 mg/kg, and X28SS0180024 at a concentration of 0.33 mg/kg.

- Silver exceeded the PAL of 4.2 mg/kg and background 95 percent UTL value of 0.84 mg/kg at one composite surface soil sampling location: X28SS0050006 at a concentration of 19.5 (J) mg/kg.

- Zinc exceeded the PAL of 46 mg/kg and background 95 percent UTL value of 37.5 mg/kg at eight composite surface soil sampling locations, ranging from 53.4 mg/kg to 483 mg/kg.

Three soil samples shipped to the laboratory were analyzed for pH (SW 846 Method 9045D), TOC (Lloyd Kahn Method), and CEC (SW 846 Method 9081).

Statistical calculations were performed to evaluate the EPCs as discussed in Section 13.21 and included in Appendix J. These calculations were used to aid in the Human Health Risk Screening, which is included as Section 13.22. The Ecological Screening is included as Section 13.23.

13.20.2 CEC, pH, and TOC

Three representative soil samples per sampling depth (0 to 0.5 feet, 0 to 2 feet, and an additional 0 to 0.5 feet) were shipped to the FBL for CEC, pH, and TOC analyses. CEC was detected at 49 mEq/100 at X28SS0040006, 48.4 mEq/100 at X28SS0060024, and 127 mEq/100 at X28SS0200006. PH was detected at 5.52 S.U. at X28SS0040006, 5.82 S.U. at X28SS0060024, and 5.8 S.U. at X28SS0200006. TOC was detected at 18,100 mg/kg at X28SS0040006, 4670 mg/kg at X28SS0060024 and 12,000 mg/kg at X28SS0200006. There are no PALs for CEC or pH. The surface background TOC is 57,200 mg/kg and the subsurface background TOC is 66,500 mg/kg. TOC is a measure of the total amount of nonvolatile, volatile, partially volatile, and particulate organic compounds in a sample. These TOC values were not exceeded. The mobility of metals is influenced by pH and CEC. CEC is a calculated value that is an estimate of the ability of the soil to attract, retain, and exchange cations. Soils with CEC above 10 mEq have a higher clay content and a lower sand content with many positions to hold cations. In general, metal cations are most mobile under acidic conditions, and a pH of 7 is neutral. The pH level in this sample would be considered slightly acidic. The mobility of metals generally increases with decreasing soil pH and CEC.

13.21 STATISTICAL EVALUATION

A 95 percent UCL is the upper bound of the associated confidence interval on the mean. Exposure assessment and cleanup decisions in support of U.S. EPA projects are often made based upon the mean concentrations of the contaminants of potential concern. A 95 percent *UCL* of the unknown population arithmetic mean is often used to estimate the EPC term (EPA 1992; EPA 2002). It is, therefore, important

to compute a reliable, conservative, and stable 95 percent *UCL* of the population mean using the available data. There are several methods for calculating 95 percent UCLs depending on the data distribution that can be used to model the sample data and the amount of censoring that is present (percent of non-detected concentrations). For chemicals with maximum concentrations greater than the PAL or 95 percent background UTL), PRO UCL version 4.00.04 was used to calculate the appropriate UCL. Then the UCL was compared to the PAL. If the UCL was less than the PAL, it was determined that the chemical would not pose a risk. If the UCL was greater than the PAL, then it was determined that further evaluations should be conducted. The following values were calculated for UXO-28 surface soil.

Parameter	PAL (mg/kg)	Background	Maximum Concentration	EPC (mg/kg)
ANTIMONY	0.27	NA	**2.3**	**0.547**
CHROMIUM	**26**	33.4	**40**	24.1
COPPER	28	20.3	**50**	25
LEAD	11	62.5	**198**	38.1
MAGNESIUM	4400	1620	**7480**	2029
MERCURY	0.058	0.16	**0.85**	0.156
SILVER	4.2	0.84	**9.8**	0.93
ZINC	46	37.5	**483**	**130**

The bolded cells indicate that the UCL exceeds the PAL and the background concentration.

13.22 HUMAN HEALTH RISK SCREENING EVALUATION

Surface soil samples at UXO 28 were analyzed for explosives and inorganics. Two explosives and 25 inorganics were detected in the 40 surface soil samples collected at UXO-28. A comparison of the detected surface soil concentrations to screening levels is presented in Table 13-4. Chromium was the only chemical detected at concentrations exceeding the direct contact human health screening levels.

HIs were estimated as shown in Appendix K Tables 13-14 and 13-15. Carcinogenic toxicity criteria is not available for chromium, consequently ILCRs could not be estimated. The HIs for residential (HI = 0.0002) and industrial (HI = 0.00002) exposures to surface soil are less than the acceptable level of 1 indicating that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions.

13.23 ECOLOGICAL RISK SCREENING EVALUATION

13.23.1 COPC Selection

Maximum chemical concentrations in surface soil were compared to the 95 percent UTL background concentration for NSF Indian Head (if available) and ecological screening levels for soil invertebrates, terrestrial plants, birds, and mammals. Chemicals were selected as COPCs for soil invertebrates or plants if the maximum concentration exceeded both the background concentration (if available) and the screening level, or if a screening level was not available for that receptor. The screening levels for are provided in Appendix L, Background and Calculations. Frequency of detection tables (fod) are also included in Appendix L.

Appendix L Table 13-1 also presents the chemicals selected for food chain modeling. Food chain modeling was conducted if the maximum detected concentration for a chemical exceeded the avian or mammal screening level. Food chain modeling was not conducted for chemicals without avian or mammal screening levels, unless the chemical is considered an important bioaccumulative chemical (USEPA, 2006) or for chemicals detected at a maximum concentration less than the 95 percent UTL background concentration for NSF Indian Head (if available).

COPCs for Terrestrial Invertebrates and Plants

Appendix L Table 13-1 presents the results of the initial COPC selection for soil invertebrates and plants from surface soil at UXO-28. This table also presents the chemicals that were retained for food chain modeling for mammals and birds (discussed below).

Soil Invertebrates

One explosive (RDX) was initially retained as a COPC for soil invertebrates because a screening level was not available. Two inorganics (lithium and zinc) were initially retained as COPCs for soil invertebrates because a screening level was not available or the maximum concentration exceeded the screening level.

Terrestrial Plants

One explosive (RDX) was initially retained as a COPC for terrestrial plants because a screening level was not available. Three inorganics (lead, lithium, and zinc) were initially retained as COPCs for soil invertebrates because the maximum concentration exceeded the screening level.

COPCs for Terrestrial Wildlife

Appendix L Table 13-2 lists chemicals selected for food chain modeling. Appendix L Table 13-2 summarizes the results of the conservative food chain modeling for terrestrial receptors, which uses very conservative exposure assumptions. Appendix L also presents the calculation worksheets.

Appendix L Table 13-2 summarizes EEQs for the conservative food chain model. Appendix L also contains spreadsheets with EEQ calculations for each receptor. A chemical was initially retained as a COPC if the calculated NOAEL EEQ was greater than 1.0 for any receptor. Six metals were initially retained as COPCs for wildlife: chromium, copper, lead, mercury, silver, and zinc.

13.23.2 Step 3A Refinement

This section presents the Step 3A refinement for chemicals that were selected as COPCs in the screening step.

Soil Invertebrates and Terrestrial Plants

RDX was initially retained as a COPC for soil invertebrates and terrestrial plants because a screening level was not available for this explosive constituent. The LANL Ecorisk Database Release 2.4 (December 2009) lists alternate benchmarks for RDX of 7.5 mg/kg for soil invertebrates and 100 mg/kg for terrestrial plants. The maximum detected RDX concentration (1.3 mg/kg) is much less than either of these benchmarks. Therefore, RDX is not expected to impact soil invertebrates or terrestrial plants.

Lead was retained as a COPC for terrestrial plants because the maximum detected concentration (198 mg/kg) exceeded the screening level (120 mg/kg). The maximum detected concentration and one other sample with a concentration of 189 mg/kg exceeded this screening level. Neither of these concentrations greatly exceeds the screening level. Therefore, impacts from lead are expected to be minimal, and lead is not retained as a COPC for terrestrial plants.

Lithium was retained as a COPC for plants because the maximum detected concentration exceeded the screening level of 2 mg/kg. Screening criteria or alternate benchmarks are not available for soil invertebrates. The screening level for plants (Efroymson et al., 1996) is based on an unspecified phytotoxic effect from the addition of a lithium salt which increases toxicity and likely overestimates exposure as compared to naturally occurring lithium. Additionally, lithium is not expected to be site-related and the detected concentrations are less than typical nationwide background concentration of

20 mg/kg (Buchman, 2008). Therefore, lithium is not retained as a COPC for soil invertebrates or terrestrial plants.

Zinc was retained as a COPC for soil invertebrates and terrestrial plants because the maximum detected concentration (464 mg/kg) exceeded the screening level for both receptors, 120 mg/kg and 160 mg/kg, respectively. Only the maximum detected concentration exceeds these screening levels. Therefore, impacts from zinc are expected to be minimal for these receptors, and zinc is not retained as a COPC for soil invertebrates or terrestrial plants.

Mammals and Birds

The EEQs from the terrestrial food chain modeling were greater than 1.0 for at least one receptor for chromium, copper, lead, mercury, silver, and zinc using maximum chemical concentrations and conservative exposure assumptions. Therefore, as part of the Step 3a refinement, risks for this pathway were recalculated using average chemical concentrations in surface soil and less conservative exposure assumptions (i.e., average ingestion rates, average body weights).

Appendix L Table 13-3 summarizes the results of the less conservative food chain modeling for terrestrial receptors. Appendix L also presents the calculation worksheets. Appendix L Table 13-3 and Appendix L only present the results of the food chain modeling for the chemicals that were evaluated as part of the Step 3A evaluation. Lead had a NOAEL EEQ only slightly greater than 1 for the robin (1.4) and is not expected to pose a significant risk. Therefore, lead is eliminated as a COPC for terrestrial wildlife. Mercury had NOAEL EEQs greater than 1 for the quail (1.04), robin (11), and the shrew (1.3). The average mercury concentration in UXO-28 surface soil (0.081 mg/kg) used for the Step 3A food chain model is less than the representative Indian Head background surface soil concentration of 0.16 mg/kg. This background concentration would produce a risk to these receptors greater than the risk from surface soil at UXO-28. Therefore, because the average site concentrations used in the food chain models were less than the background concentration, significant site-related risks to these receptors are not expected. Therefore, mercury is eliminated as a COPC for risks to birds and mammals.

13.23.3 Ecological Risk Screening Summary

Initially, one explosive and two inorganics were retained as COPCs for further evaluation for soil invertebrates; one explosive and three inorganics were retained as COPCs for further evaluation for terrestrial plants; and six inorganics were retained as COPCs for further evaluation for terrestrial wildlife.

After the Step 3A refinement, no chemicals were retained as COPCs for ecological receptors from detected concentrations of chemicals in surface soil at UXO-28.

13.24 UPDATED CONCEPTUAL SITE MODEL

A three-dimensional depiction of the EOD School Demolition Area is provided as Figure 13-6. Receptors would be trespassers and ecological receptors by ingestion, dermal contact, and inhalation of surface soil and sediment. Potentially complete exposure pathways exist for both human and ecological receptors under both current and hypothetical future land uses. Only MC associated with EOD School Demolition Area are considered in the CSM exposure pathway analysis. A general description of the CSM exposure pathway analysis was included in Section 10.3.11 of the UFP SAP as follows: "The nature of the activities that presumably occurred at the EOD School Demolition Area suggests that MEC may be present. Therefore, potentially complete pathways exist for human and ecological receptors for MEC in surface soil. This includes receptors for hand/tread underfoot contact as well as intrusive work that may be conducted at the EOD School Demolition Area. Trespassers are anticipated to be exposed via non-intrusive surface soil activities at the range, but it is unlikely they would be exposed to subsurface soil through intrusive activities. MEC is not anticipated in the subsurface because explosives were only used on the surface at this site."

13.25 EXPOSURE PATHWAY ANALYSES

Two MPPEH items and 110 anomalies discovered during the MEC SI, represent potentially complete exposure pathways for MEC. An Exposure Pathway Analysis for MEC at the EOD School Demolition Area is presented as Figure 13-7A. Eight metals constituents exceeded the PALs in soil samples collected during the MC SI investigation. As illustrated in the MC Exposure Pathway Analysis (Figure 13-7B), soil impacted by MC represents the primary source medium. Exposures to surface soil, subsurface soil, and surface water/sediment containing MC may present a complete pathway for human and ecological receptors. All human and ecological receptors have complete exposure pathways for direct contact with MC in surface soil, which includes dermal contact, ingestion, and inhalation (dust). Runoff and/or erosion may transport the MC from surface soil to surface water/sediment, so a complete exposure pathway also exists for all human and ecological receptors of surface water/sediment. Precipitation infiltration may provide for contaminant mobility into the subsurface soil and into the shallow surficial groundwater aquifer, which is assumed to be connected to nearby surface water bodies. Potentially complete exposure pathways exist for MC in subsurface soil (direct contact, ingestion and inhalation during intrusive work activities). The food chain is also a potentially complete pathway because hunting is permitted within much of the site. Although confining layers are expected to prevent the

migration of MC to the lower aquifers used for water supplies, potentially complete pathways exist for MC in shallow groundwater for human receptors."

13.26 CONCLUSIONS

- Utilities within the EOD School Demolition Area include potable water on the western side and sanitary sewer toward the center of the range. Electric utilities are located outside the northwestern corner of the range. During its use as the EOD School Demolition Area, the range was an open field. The EOD School Demolition Area is located within an upland hunting area according to the 2003-2004 Stump Neck Annex Hunting Map.

- The EOD School Demolition Area was used from 1944 to 1949, and supported the introduction of Indian Head EOD School graduates to live explosives. The introduced materials included blocks of TNT, tetryl packs, caps, primer cord, safety fuses, and shaped charges. Students would demonstrate the use of these explosives to shear rails and trees, blow holes in the ground, and split live bombs in situ using shaped charges. As a result of the training activities, MEC are suspected to be present over the entire area.

- Aboveground objects displayed in the legend as surface metals (non-munitions related) appear in several locations to have created data anomalies. The presence or absence of additional items (and potential targets) in these areas cannot be determined from the geophysical data alone.

- One hundred ten anomaly items were picked (analytic signal values of 50 and above were picked) using the Blakely Test in the UX-Detect module of Geosoft across the surveyed area from the magnetometer data. One of the transects labeled on Figure 13-3A had a high concentration of anomalies which may be attributed to the transect being positioned over or near a metallic utility line. The picked items are scattered around the site, but many tend to be located in clusters. Some anomalies are at the edge of survey, potentially requiring further delineation. The nature of the buried metallic items cannot be determined from the geophysical data alone; however, given the site's history of military training and the large quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond.

- Munitions constituents potentially present at the EOD School Demolition Area include metals, TNT (2,4,6-trinitrotoluene), explosive residuals, Tetryl, white phosphorous, blackpowder (potassium nitrate, sulphur, charcoal or coal, nitrocellulose), chloroform, and BEHP.

- In summary, two suspect MPPEH items were discovered during detector-aided surface sweeps of the EOD Demolition Area, and one during the MC sampling activities (Table ES-2). The first two items, an aluminum fuze casing and German bomb fuze, were discovered in the 100 percent coverage area. The fuze casing was empty and dented, and the bomb fuze was rusted out with a hole in the buster charge revealing no explosive content. The 500-pound old style bomb was found just outside of the EOD School Demolition Area boundary.

- The PALs were not exceeded for explosive constituents. Nitroglycerin was detected, but the PAL was not exceeded, at two sampling locations. In addition, RDX was detected, but the PAL was not exceeded, at one location.

- The PAL and background 95% UTL values were exceeded for the composite surface soil sampling locations for eight metals constituents : Antimony exceeded the PAL at six locations, Chromium exceeded at three locations, Copper exceeded at nine locations, Lead exceeded at five locations, Magnesium exceeded at one location, Mercury exceeded at two locations, Silver exceeded at one location, Zinc exceeded at eight locations.

- The HIs for residential (HI = 0.0002) and industrial (HI = 0.00002) exposures to surface soil are less than the acceptable level of 1 indicating that adverse noncarcinogenic health effects are not anticipated for these receptors under the defined exposure conditions.

- In the initial ecological screening assessment one explosive and two inorganics were retained as COPCs for further evaluation for soil invertebrates; one explosive and three inorganics were retained as COPCs for further evaluation for terrestrial plants; and six inorganics were retained as COPCs for further evaluation for terrestrial wildlife. After the Step 3A refinement, no chemicals were retained as COPCs for ecological receptors from detected concentrations of chemicals in surface soil at UXO-28.

- The CSM indicated that potentially complete exposure pathways for MEC and complete exposure pathways for MC existed for both human and ecological receptors under current and hypothetical future land uses. Unacceptable levels of human health and ecological hazards from MEC and MC may exist.

13.26.1 Data Gaps

There were no data gaps.

13.27 RECOMMENDATIONS FOR NEXT PHASE

Although the human health and ecological screenings did not retain any COPCs related to human exposures or ecological receptors from detected concentrations of chemicals in surface soil at UXO 5, two MPPEH items were detected on the surface during detector-aided surface sweeps. One hundred ten anomaly items were picked. The picked items are scattered around the site, but many tend to be located in clusters. The nature of the buried metallic items cannot be determined from the geophysical data alone; however, given the site's history of military training and the large quantity of items detected, it can be reasoned that there is at least the potential for MEC or military training equipment to be buried in the surveyed area and beyond.

Though the nature of the buried ferrous metallic items cannot be determined from the geophysical data alone, given the site's potential for discarded munitions or military training equipment, it can be reasoned that there is at least the potential for buried caches of torpedo casings, MEC or military training equipment. The nature of these buried metallic items cannot be determined from the geophysical data, and can only be characterized through intrusive investigation. Further geophysical delineation is needed. Based on these results, a more extensive evaluation, in the form of an RI, is recommended for UXO-28, focusing mainly in the eastern side of the site. The scope of effort for the RI, which will include further characterization, delineation, and intrusive investigations, will be determined during project planning.

MEC

Proceed to an RI. The RI should include:

- Clearance of surface MEC/MPPEH and non-munition debris.
- Subsurface geophysical investigation.
- Investigation of representative subset of subsurface anomaly discovered during the geophysical investigation.

MC

- No further action is recommended, however MC sampling if subsurface MEC/MPPEH are found.

TABLE 13-1

MUNITION TYPES AND CHEMICALS
EOD SCHOOL DEMOLITION AREA - UXO 28
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

MUNITIONS TYPES USED/STORED AT THE FACILITY	ASSOCIATED CHEMICAL CONSTITUENTS
TNT	2,4,6-trinitrotoluene
Tetryl packs	Tetryl
100-pound bombs and other live bombs	Tetryl, white phosphorous
Shape charges, Caps, Primer cords, Safety fuses	Blackpowder (potassium nitrate, sulphur, charcoal or coal, nitrocellulose)
	Metals
	Chloroform
	bis(2 ethylhexyl) phthalate (BEHP)

Source: NSF Indian Head - Stump Neck Annex UFP SAP for MEC, September 2009

TABLE 13-2

EOD SCHOOL DEMOLITION AREA
MUNITIONS FINDS DATA ENTRY FORM
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

FACILITY	Stump Neck Annex of Indian Head MD
SITE NUMBER & NAME	112G00810 MMRP Site Investigation

Date (MM/DD/YYYY)	Time	Transect/ Grid Number	Item Number	Item General Type (indicate w/ √)			GPS Survey Coordinates		Item Identification		Disposition (indicate w/ √ as			Notifications Completed (indicate w/ √ as applicable)	Photograph Number and Link
				MEC	MPPEH	Other	Northing	Easting	Type	Appearance (e.g., burned, buried, staged, rusted, etc.)	BIP	Off-Site Removal	Date Addressed (MM/DD/YYYY)		
11/17/2009	1000	ESDA 100% Area	ESDA-01			X	322962.34	1249691.14	Fuze, nose	Aluminum, dented, only the outer shell is present.			11/17/2009	X	ESDA-01
11/18/2009	1400	ESDA 100% Area	ESDA-02			X	323083.64	1249797.43	Fuze	Rusted, hole in the base of the booster cup, no explosives.			11/21/2009	X	ESDA-02
01/21/2010		Near ESDA	ESDA-03			X	322837.76	1249380.95	Bomb casing, 500lb	Rusted, appears to have had explosive demolition performed.			01/21/2010	X	ESDA-03

TABLE 13-3

MC SAMPLING PROGRAM
EOD SCHOOL DEMOLITION AREAS (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Sampling Locations	Justification
X28SB001	Geophysical Anomolies
X28SB002	Geophysical Anomolies
X28SB003	Geophysical Anomolies
X28SB004	Check Sampling
X28SB005	Geophysical Anomolies
X28SB006	Geophysical Anomolies
X28SB007	MPPEH/Geophysical Anomolies
X28SB008	Geophysical Anomolies
X28SB009	Check Sampling
X28SB010	Geophysical Anomolies
X28SB011	MPPEH/Geophysical Anomolies
X28SB012	Geophysical Anomolies
X28SB013	Check Sampling
X28SB014	MPPEH/Geophysical Anomolies
X28SB015	Geophysical Anomolies
X28SB016	Check Sampling
X28SB017	Check Sampling
X28SB018	Geophysical Anomolies
X28SB019	Geophysical Anomolies
X28SB020	Geophysical Anomolies

TABLE 13-4

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
PAGE 1 OF 5

				a01	a02	a03	a04	a05	a06	a07	a08	a09
				001	002	003	004	005	006	007	008	009
				X28SS0010006	X28SS0010024	X28SS0020006	X28SS0020024	X28SS0030006	X28SS0030024	X28SS0040006	X28SS0040024	X28SS0050006
				X28SB001	X28SB001	X28SB002	X28SB002	X28SB003	X28SB003	X28SB004	X28SB004	X28SB005
				00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
				X28SS0010006	X28SS0010024	X28SS0020006	X28SS0020024	X28SS0030006	X28SS0030024	X28SS0040006	X28SS0040024	X28SS0050006
				20100120	20100120	20100120	20100120	20100120	20100121	20100121	20100121	20100121
				20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121
				NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG
	matrix			SO	SO	SO	SO	SO	SO	SO	SO	SO
	duplicate											
	top_depth			0	0	0	0	0	0	0	0	0
	bottom_dep			0.5	2	0.5	2	0.5	2	0.5	2	0.5
	submatrix			SS	SS	SS	SS	SS	SS	SS	SS	SS
cas	sort	utl95val	minorpal	c_001	c_002	c_003	c_004	c_005	c_006	c_007	c_008	c_009
	Explosives (mg/kg)											
99-35-4	1,3,5-TRINITROBENZENE	NA	9	2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 UJ
99-65-0	1,3-DINITROBENZENE	NA	0.61	2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 UJ
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
99-08-1	3-NITROTOLUENE	NA	0.61	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	12 UJ	0.21 J	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ
78-11-5	PETN	NA	NA	12 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	2 UR	0.2 UR	0.2 UR	0.2 UR	0.2 UR	0.2 UR	0.2 U	0.2 U	0.2 UR
	Inorganics (mg/kg)											
7429-90-5	ALUMINUM	19700	7700	8760 L [PAL] [ORNL] [MDRES] [SSL]	9500 L [PAL] [ORNL] [MDRES] [SSL]	11100 L [PAL] [ORNL] [MDRES] [SSL]	7580 L [SSL]	13500 L [PAL] [ORNL] [MDRES] [SSL]	14000 L [PAL] [ORNL] [MDRES] [SSL]	9000 [PAL] [ORNL] [MDRES] [SSL]	13000 [PAL] [ORNL] [MDRES] [SSL]	7670 L [SSL]
7440-36-0	ANTIMONY	NA	0.27	0.066 UL	0.036 J	0.063 J	0.032 UL	0.1 J	0.063 UL	0.14 L	0.065 UL	0.032 UL
7440-38-2	ARSENIC	14.9	0.026	3.3 L [PAL] [ORNL] [MDRES] [MDSGW]	2.2 L [PAL] [ORNL] [MDRES] [MDSGW]	2.1 L [PAL] [ORNL] [MDRES] [MDSGW]	1.2 L [PAL] [ORNL] [MDRES] [MDSGW]	2.6 L [PAL] [ORNL] [MDRES] [MDSGW]	2.0 L [PAL] [ORNL] [MDRES] [MDSGW]	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	2.0 [PAL] [ORNL] [MDRES] [MDSGW]	1.2 L [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	55.7	34.5	56.8	57.8	65.6	46.5	52.6 K	75.6 K	50.6
7440-41-7	BERYLLIUM	1.1	16	0.81	0.46 J	0.6	0.6	0.58	0.48	0.6	0.84	0.5
7440-43-9	CADMIUM	2.5	0.36	0.2 J	0.079 U	0.35	0.13 J	0.16 J	0.085 J	0.23 J	0.1 J	0.082 U
7440-70-2	CALCIUM	2060	NA	13700 [BKG]	1990	3690 [BKG]	2580 [BKG]	8610 [BKG]	3650 [BKG]	610 K	399 K	297 J
7440-47-3	**CHROMIUM**	33.4	**26**	29.2 [PAL] [MDRES] [SSL]	17.1	33.0 [PAL] [MDRES] [SSL]	32.9 [PAL] [MDRES] [SSL]	**40.0 [BKG] [PAL] [MDRES] [SSL]**	22.7	14.6 K	15.5 K	13.7
7440-48-4	COBALT	22.3	2.3	10.3 [PAL] [ORNL]	6.2 [PAL] [ORNL]	5.7 [PAL] [ORNL]	5.2 [PAL] [ORNL]	7.2 [PAL] [ORNL]	4.6 [PAL] [ORNL]	4.6 [PAL] [ORNL]	6.4 [PAL] [ORNL]	3.2 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	24.3 J [BKG]	7.3 J	12.1 J	9.8 J	15.8 J	6.3 J	8.8 J	6.7 J	6.6 J
7439-89-6	IRON	38500	5500	19400 [PAL] [ORNL] [MDRES] [SSL]	12700 [PAL] [ORNL] [MDRES] [SSL]	12100 [PAL] [ORNL] [MDRES] [SSL]	13900 [PAL] [ORNL] [MDRES] [SSL]	12900 [PAL] [ORNL] [MDRES] [SSL]	10700 [PAL] [ORNL] [MDRES] [SSL]	9010 [PAL] [ORNL] [MDRES] [SSL]	9520 [PAL] [ORNL] [MDRES] [SSL]	7140 J [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	24.7 [PAL] [SSL]	13.4 [PAL] [SSL]	61.2 [PAL] [SSL]	53.2 [PAL] [SSL]	17.7 [PAL] [SSL]	12.9 [PAL] [SSL]	26.5 [PAL] [SSL]	18.2 [PAL] [SSL]	12.1 J [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	6.2 [PAL] [OPLNT]	6.5 [PAL] [OPLNT]	9.8 [PAL] [OPLNT]	11.0 [PAL] [OPLNT]	13.1 [PAL] [OPLNT]	8.0 [PAL] [OPLNT]	7.2 [PAL] [OPLNT]	8.6 [PAL] [OPLNT]	5.2 J [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	4400 [BKG]	1590	3030 [BKG]	2330 [BKG]	**7480 [BKG] [PAL] [BTAG]**	2830 [BKG]	936	1040	800 J
7439-96-5	MANGANESE	1390	160	489 [PAL] [ORNL] [MDRES] [SSL]	158	327 [PAL] [ORNL] [MDRES] [SSL]	198 [PAL] [ORNL] [MDRES]	212 [PAL] [ORNL] [MDRES]	140	335 [PAL] [ORNL] [MDRES] [SSL]	413 [PAL] [ORNL] [MDRES] [SSL]	302 [PAL] [ORNL] [MDRES] [SSL]
7439-97-6	**MERCURY**	0.16	0.058	0.028 U	0.017 J	0.053	0.018 J	0.045 J	0.025 J	0.052	0.031 J	0.019 J
7440-02-0	NICKEL	15.4	38	22.9 [BKG]	14.3	24.7 [BKG]	18.1 [BKG]	34.5 [BKG]	15.1	8.1	9.6	5.9 J
7440-09-7	POTASSIUM	1470	NA	712	750	1180	1300	1940 [BKG]	1140	983	957	676 J
7782-49-2	SELENIUM	1.2	0.52	0.094 J	0.032 J	0.081 J	0.032 UL	0.066 UL	0.032 UL	0.066 U	0.089 J	0.054 J
7440-22-4	SILVER	0.84	4.2	0.17 UL	0.079 UL	0.081 UL	0.082 UL	0.083 UL	0.079 UL	0.081 UL	0.081 UL	**19.5 J [BKG] [PAL] [SSL]**
7440-23-5	SODIUM	120	NA	200 [BKG]	94.0	70.0	71.4	80.9	33.4	27.0	30.6	17.1 J
7440-24-6	STRONTIUM	NA	120	32.0	7.4	12.3	10.4 K	14.1	8.3	6.7 K	6.5 K	4.1
7440-31-5	TIN	NA	0.89	1.7 U	0.79 U	0.81 U	0.83 U	0.83 U	0.79 U	0.81 U	0.82 U	0.82 U
7440-62-2	VANADIUM	53.3	7.8	26.2 J [PAL] [MDRES] [SSL]	21.1 J [PAL] [MDRES] [SSL]	32.1 J [PAL] [MDRES] [SSL]	31.1 J [PAL] [MDRES] [SSL]	29.0 J [PAL] [MDRES] [SSL]	20.5 J [PAL] [MDRES] [SSL]	24.6 K [PAL] [MDRES] [SSL]	24.8 K [PAL] [MDRES] [SSL]	15.9 J [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	43.3 [BKG]	24.2	**55.2 [BKG] [PAL] [SSL]**	40.5 [BKG]	**56.5 [BKG] [PAL] [SSL]**	33.1	26.3 K	27.1 K	23.6
	Miscellaneous Parameters											
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100									49		
TTNUS288	PERCENT MOISTURE (%)									25		
TTNUS002	PH (S.U.)	8.8								5.52		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200								18100		
TTNUS046	**TOTAL SOLIDS (%)**	79.2								75		

TABLE 13-4

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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				a10	a11	a12	a13	a14	a15	a16	a17	a18
				010	011	012	013	014	015	016	017	018
				X28SS0050006-D	X28SS0050024	X28SS0060006	X28SS0060024	X28SS0060024-D	X28SS0070006	X28SS0070024	X28SS0080006	X28SS0080024
				X28SB005	X28SB005	X28SB006	X28SB006	X28SB006	X28SB007	X28SB007	X28SB008	X28SB008
				00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
				FD012110-02	X28SS0050024	X28SS0060006	X28SS0060024	FD012110-01	X28SS0070006	X28SS0070024	X28SS0080006	X28SS0080024
				20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100120	20100120
				20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121
				DUP	NORMAL	NORMAL	ORIG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
	matrix			SO	SO	SO	SO	SO	SO	SO	SO	SO
	duplicate			X28SS0050006				X28SS0060024				
	top_depth			0	0	0	0	0	0	0	0	0
	bottom_dep			0.5	2	0.5	2	2	0.5	2	0.5	2
	submatrix			SS	SS	SS	SS	SS	SS	SS	SS	SS
cas	sort	utl95val	minorpal	c_010	c_011	c_012	c_013	c_014	c_015	c_016	c_017	c_018
	Explosives (mg/kg)											
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2 U	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2 U	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	1.2 U	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U
78-11-5	PETN	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	0.2 U	0.2 UR	0.2 UR	0.2 U	0.2 U	0.2 UR	0.2 UR	0.2 UR	0.2 U
	Inorganics (mg/kg)											
7429-90-5	ALUMINUM	19700	7700	8180 [PAL] [ORNL] [MDRES] [SSL]	11000 L [PAL] [ORNL] [MDRES] [SSL]	5130 L [SSL]	13600 [PAL] [ORNL] [MDRES] [SSL]	10300 [PAL] [ORNL] [MDRES] [SSL]	14100 L [PAL] [ORNL] [MDRES] [SSL]	12300 L [PAL] [ORNL] [MDRES] [SSL]	17300 L [PAL] [ORNL] [MDRES] [SSL]	17600 L [PAL] [ORNL] [MDRES] [SSL]
7440-36-0	ANTIMONY	NA	0.27	0.033 U	0.032 UL	0.032 UL	0.064 J	0.033 U	0.033 J	0.033 UL	0.064 UL	0.12 UL
7440-38-2	ARSENIC	14.9	0.026	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	1.9 L [PAL] [ORNL] [MDRES] [MDSGW]	0.94 L [PAL] [ORNL] [MDRES] [MDSGW]	3.0 [PAL] [ORNL] [MDRES] [MDSGW]	2.1 [PAL] [ORNL] [MDRES] [MDSGW]	2.6 L [PAL] [ORNL] [MDRES] [MDSGW]	2.1 L [PAL] [ORNL] [MDRES] [MDSGW]	3.1 L [PAL] [ORNL] [MDRES] [MDSGW]	2.9 L [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	62.2	53.8	65.3	53.6 K	66.6	61.5	63.9	54.4	60.6
7440-41-7	BERYLLIUM	1.1	16	0.63	0.55	0.53	0.57	0.66	0.67	0.61	0.69	0.74
7440-43-9	CADMIUM	2.5	0.36	0.081 U	0.08 U	0.083 U	0.081 U	0.083 U	0.081 U	0.083 U	0.082 U	0.17 U
7440-70-2	CALCIUM	2060	NA	513 J	426	346	328 K	440	345	307	2270 [BKG]	2140 [BKG]
7440-47-3	**CHROMIUM**	33.4	**26**	18.5	15.8	16.5	22.0 K	25.7 [PAL] [MDRES]	20.1	16.3	**35.0 [BKG] [PAL] [MDRES] [SSL]**	**38.2 [BKG] [PAL] [MDRES] [SSL]**
7440-48-4	COBALT	22.3	2.3	5.3 [PAL] [ORNL]	3.5 [PAL] [ORNL]	3.9 [PAL] [ORNL]	3.6 [PAL] [ORNL]	4.9 [PAL] [ORNL]	5.5 [PAL] [ORNL]	4.9 [PAL] [ORNL]	6.9 [PAL] [ORNL]	6.6 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	**33.1 J [BKG] [PAL] [SSL]**	5.8 J	10.3 J	**54.7 J [BKG] [PAL] [SSL]**	9.2 J	**34.9 J [BKG] [PAL] [SSL]**	**29.0 J [BKG] [PAL] [SSL]**	9.6 J	10.6 J
7439-89-6	IRON	38500	5500	13800 J [PAL] [ORNL] [MDRES] [SSL]	10200 [PAL] [ORNL] [MDRES] [SSL]	9710 [PAL] [ORNL] [MDRES] [SSL]	15300 [PAL] [ORNL] [MDRES] [SSL]	17500 [PAL] [ORNL] [MDRES] [SSL]	14200 [PAL] [ORNL] [MDRES] [SSL]	11000 [PAL] [ORNL] [MDRES] [SSL]	17200 [PAL] [ORNL] [MDRES] [SSL]	20600 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	**189 J [BKG] [PAL] [SSL]**	11.3 [PAL] [SSL]	17.3 [PAL] [SSL]	8.1	11.6 [PAL] [SSL]	**198 [BKG] [PAL] [SSL]**	**122 [BKG] [PAL] [SSL]**	14.7 [PAL] [SSL]	13.8 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	9.4 J [PAL] [OPLNT]	6.9 [PAL] [OPLNT]	6.6 [PAL] [OPLNT]	10.0 [PAL] [OPLNT]	10.8 [PAL] [OPLNT]	10.4 [PAL] [OPLNT]	8.4 [PAL] [OPLNT]	12.0 [PAL] [OPLNT]	14.5 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	1360 J	1040	1110	1440	1680 [BKG]	1440	1170	3400 [BKG]	3470 [BKG]
7439-96-5	MANGANESE	1390	160	328 [PAL] [ORNL] [MDRES] [SSL]	261 [PAL] [ORNL] [MDRES] [SSL]	209 [PAL] [ORNL] [MDRES]	146	181 [PAL] [ORNL] [MDRES]	278 [PAL] [ORNL] [MDRES] [SSL]	302 [PAL] [ORNL] [MDRES] [SSL]	179 [PAL] [MDRES]	143
7439-97-6	**MERCURY**	0.16	0.058	0.024	0.021 J	0.015 J	0.025 J	0.022 J	0.035 J	0.024 J	0.03 J	0.026 U
7440-02-0	NICKEL	15.4	38	12.6 J	8.3	8.0	11.3	14.3	12.8	11.1	27.4 [BKG]	26.7 [BKG]
7440-09-7	POTASSIUM	1470	NA	1390 J	894	1170	1700 [BKG]	1840 [BKG]	1390	1180	1680 [BKG]	2090 [BKG]
7782-49-2	SELENIUM	1.2	0.52	0.033 U	0.032 UL	0.032 UL	0.066 U	0.036 J	0.032 UL	0.033 UL	0.064 UL	0.12 UL
7440-22-4	SILVER	0.84	4.2	0.093 J	1.8 [BKG]	1.8 [BKG]	0.24 L	0.43 L	0.081 UL	0.083 UL	0.082 UL	0.17 UL
7440-23-5	SODIUM	120	NA	26.3	17.8 J	20.5 J	22.9 J	25.9	24.8	25.9	78.3	91.1
7440-24-6	STRONTIUM	NA	120	6.4	5.1	5.5	5.9 K	6.9	5.9	5.7	9.2	10.0
7440-31-5	TIN	NA	0.89	2.9 [PAL] [BTAG]	0.8 U	0.83 U	0.81 U	0.83 U	3.1 [PAL] [BTAG]	3.8 [PAL] [BTAG]	0.82 U	1.7 U
7440-62-2	VANADIUM	53.3	7.8	28.9 [PAL] [MDRES] [SSL]	21.4 J [PAL] [MDRES] [SSL]	21.3 J [PAL] [MDRES] [SSL]	28.7 K [PAL] [MDRES] [SSL]	32.5 [PAL] [MDRES] [SSL]	30.0 J [PAL] [MDRES] [SSL]	23.7 J [PAL] [MDRES] [SSL]	34.2 J [PAL] [MDRES] [SSL]	39.7 J [PAL] [ORNL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	33.3	25.8	30.3	36.4 K	34.8	33.1	27.5	42.2 [BKG]	45.2 [BKG]
	Miscellaneous Parameters											
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100						48.4					
TTNUS288	PERCENT MOISTURE (%)						16.6					
TTNUS002	PH (S.U.)	8.8					5.82					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200					4670					
TTNUS046	**TOTAL SOLIDS (%)**	79.2					**83.4 [BKG]**					

TABLE 13-4

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
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				a19	a20	a21	a22	a23	a24	a25	a26	a27
				019	020	021	022	023	024	025	026	027
				X28SS0090006	X28SS0090024	X28SS0100006	X28SS0100024	X28SS0110006	X28SS0110024	X28SS0120006	X28SS0120024	X28SS0130006
				X28SB009	X28SB009	X28SB010	X28SB010	X28SB011	X28SB011	X28SB012	X28SB012	X28SB013
				00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
				X28SS0090006	X28SS0090024	X28SS0100006	X28SS0100024	X28SS0110006	X28SS0110024	X28SS0120006	X28SS0120024	X28SS0130006
				20100120	20100120	20100121	20100121	20100121	20100121	20100121	20100121	20100121
				20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121
				NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
	matrix			SO	SO	SO	SO	SO	SO	SO	SO	SO
	duplicate											
	top_depth			0	0	0	0	0	0	0	0	0
	bottom_dep			0.5	2	0.5	2	0.5	2	0.5	2	0.5
	submatrix			SS	SS	SS	SS	SS	SS	SS	SS	SS
cas	sort	utl95val	minorpal	c_019	c_020	c_021	c_022	c_023	c_024	c_025	c_026	c_027
	Explosives (mg/kg)											
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.24 U	0.25 U	0.25 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.24 U	0.25 U	0.25 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	0.58 J	1.2 U	1.2 U	1.2 U
78-11-5	PETN	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	0.2 UR	0.2 UR	0.2 UR	0.2 UR	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	Inorganics (mg/kg)											
7429-90-5	ALUMINUM	19700	7700	10100 L [PAL] [ORNL] [MDRES] [SSL]	10000 L [PAL] [ORNL] [MDRES] [SSL]	8070 L [PAL] [ORNL] [MDRES] [SSL]	11000 L [PAL] [ORNL] [MDRES] [SSL]	8320 [PAL] [ORNL] [MDRES] [SSL]	11000 [PAL] [ORNL] [MDRES] [SSL]	12400 [PAL] [ORNL] [MDRES] [SSL]	12200 [PAL] [ORNL] [MDRES] [SSL]	3820 [SSL]
7440-36-0	ANTIMONY	NA	0.27	0.66 L [PAL] [SSL]	0.37 L [PAL] [SSL]	2.3 L [PAL] [SSL]	1.9 L [PAL] [SSL]	0.044 J	0.033 UL	0.076 J	0.066 U	0.036 J
7440-38-2	ARSENIC	14.9	0.026	4.8 L [PAL] [ORNL] [MDRES] [MDSGW]	2.8 L [PAL] [ORNL] [MDRES] [MDSGW]	5.1 L [PAL] [ORNL] [MDRES] [MDSGW]	3.4 L [PAL] [ORNL] [MDRES] [MDSGW]	1.3 [PAL] [ORNL] [MDRES] [MDSGW]	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	0.95 [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	50.3	48.6	114 [BKG]	111 [BKG]	51.5 K	63.8 K	59.3 K	48.1 K	49.7 K
7440-41-7	BERYLLIUM	1.1	16	0.49	0.55	0.6	0.79	0.56	0.59	0.66	0.57	0.53
7440-43-9	CADMIUM	2.5	0.36	0.08 U	0.08 U	0.78 [PAL] [SSL]	0.3 K	0.08 U	0.081 U	0.081 U	0.08 U	0.082 J
7440-70-2	CALCIUM	2060	NA	587	586	989	767	260 K	245 K	572 K	681 K	848 K
7440-47-3	**CHROMIUM**	33.4	**26**	18.4	24.2 [PAL] [MDRES]	18.5	18.9	13.6 K	13.3 K	20.7 K	22.2 K	15.7 K
7440-48-4	COBALT	22.3	2.3	3.6 [PAL] [ORNL]	3.3 [PAL] [ORNL]	4.7 [PAL] [ORNL]	5.2 [PAL] [ORNL]	3.7 [PAL] [ORNL]	3.7 [PAL] [ORNL]	5.2 [PAL] [ORNL]	3.7 [PAL] [ORNL]	3.8 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	23.7 J [BKG]	15.6 J	**50.0 J [BKG] [PAL] [SSL]**	**30.5 J [BKG] [PAL] [SSL]**	9.9 J	5.2 J	12.3 J	8.2 J	**44.5 J [BKG] [PAL] [SSL]**
7439-89-6	IRON	38500	5500	10800 [PAL] [ORNL] [MDRES] [SSL]	13600 [PAL] [ORNL] [MDRES] [SSL]	16900 [PAL] [ORNL] [MDRES] [SSL]	14100 [PAL] [ORNL] [MDRES] [SSL]	8000 [PAL] [ORNL] [MDRES] [SSL]	8120 [PAL] [ORNL] [MDRES] [SSL]	13500 [PAL] [ORNL] [MDRES] [SSL]	13900 [PAL] [ORNL] [MDRES] [SSL]	8930 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	59.2 [PAL] [SSL]	33.2 [PAL] [SSL]	**112 [BKG] [PAL] [SSL]**	44.2 [PAL] [SSL]	17.6 [PAL] [SSL]	8.7	27.2 [PAL] [SSL]	13.5 [PAL] [SSL]	20.5 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	7.7 [PAL] [OPLNT]	9.6 [PAL] [OPLNT]	6.5 [PAL] [OPLNT]	9.5 [PAL] [OPLNT]	6.2 [PAL] [OPLNT]	7.3 [PAL] [OPLNT]	9.7 [PAL] [OPLNT]	8.9 [PAL] [OPLNT]	6.0 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	1080	1380	857	1170	878	924	1470	1410	943
7439-96-5	MANGANESE	1390	160	169 [PAL] [MDRES]	119	673 [PAL] [ORNL] [MDRES] [SSL]	528 [PAL] [ORNL] [MDRES] [SSL]	281 [PAL] [ORNL] [MDRES] [SSL]	253 [PAL] [ORNL] [MDRES] [SSL]	274 [PAL] [ORNL] [MDRES] [SSL]	158	279 [PAL] [ORNL] [MDRES] [SSL]
7439-97-6	**MERCURY**	0.16	0.058	0.022	0.017 J	0.08 [PAL] [BTAG]	0.042 J	0.042	0.021 J	0.034 J	0.024 J	0.021 J
7440-02-0	NICKEL	15.4	38	6.9	9.8	11.6	12.9	6.5	6.8	10.6	9.8	6.9
7440-09-7	POTASSIUM	1470	NA	1480 [BKG]	1960 [BKG]	746	1000	811	718	1530 [BKG]	1630 [BKG]	1040
7782-49-2	SELENIUM	1.2	0.52	0.031 UL	0.033 UL	0.21 L	0.038 J	0.032 U	0.066 U	0.066 U	0.066 U	0.033 U
7440-22-4	SILVER	0.84	4.2	0.08 UL	0.08 UL	1.8 L [BKG]	0.53 L	0.4 L	0.081 UL	0.33 L	0.14 J	0.08 UL
7440-23-5	SODIUM	120	NA	26.4	38.1	40.8	44.7	18.9 J	19.8 J	29.1	29.4	22.0 J
7440-24-6	STRONTIUM	NA	120	12.8	13.3	11.8	11.3	4.6 K	4.8 K	7.0 K	6.0 K	5.9 K
7440-31-5	TIN	NA	0.89	0.8 U	0.8 U	2.4 J [PAL] [BTAG]	5.1 [PAL] [BTAG]	0.8 U	0.81 U	1.9 J [PAL] [BTAG]	0.8 U	0.81 J
7440-62-2	VANADIUM	53.3	7.8	22.7 J [PAL] [MDRES] [SSL]	29.3 J [PAL] [MDRES] [SSL]	18.3 J [PAL] [MDRES] [SSL]	24.3 J [PAL] [MDRES] [SSL]	19.3 K [PAL] [MDRES] [SSL]	18.6 K [PAL] [MDRES] [SSL]	27.4 K [PAL] [MDRES] [SSL]	26.7 K [PAL] [MDRES] [SSL]	20.3 K [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	43.2 [BKG]	34.2	**464 [BKG] [PAL] [SSL]**	**483 [BKG] [PAL] [SSL]**	23.9 K	22.3 K	36.2 K	28.9 K	38.5 K [BKG]
	Miscellaneous Parameters											
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100											
TTNUS288	PERCENT MOISTURE (%)											
TTNUS002	PH (S.U.)	8.8										
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200										
TTNUS046	**TOTAL SOLIDS (%)**	79.2										

TABLE 13-4

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				a28	a29	a30	a31	a32	a33	a34	a35
				028	029	030	031	032	033	034	035
				X28SS0130024	X28SS0140006	X28SS0140024	X28SS0150006	X28SS0150024	X28SS0160006	X28SS0160024	X28SS0170006
				X28SB013	X28SB014	X28SB014	X28SB015	X28SB015	X28SB016	X28SB016	X28SB017
				00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
				X28SS0130024	X28SS0140006	X28SS0140024	X28SS0150006	X28SS0150024	X28SS0160006	X28SS0160024	X28SS0170006
				20100121	20100120	20100120	20100120	20100120	20100121	20100121	20100121
				20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121
				NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
	matrix			SO	SO	SO	SO	SO	SO	SO	SO
	duplicate										
	top_depth			0	0	0	0	0	0	0	0
	bottom_dep			2	0.5	2	0.5	2	0.5	2	0.5
	submatrix			SS	SS	SS	SS	SS	SS	SS	SS
cas	sort	utl95val	minorpal	c_028	c_029	c_030	c_031	c_032	c_033	c_034	c_035
	Explosives (mg/kg)										
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	1.2 U	1.2 U	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U
78-11-5	PETN	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	0.2 U	0.2 U	0.2 UR	0.2 UR	0.2 UR	0.2 U	0.2 U	0.2 U
	Inorganics (mg/kg)										
7429-90-5	ALUMINUM	19700	7700	3670 [SSL]	14200 [PAL] [ORNL] [MDRES] [SSL]	13200 L [PAL] [ORNL] [MDRES] [SSL]	13300 L [PAL] [ORNL] [MDRES] [SSL]	11600 L [PAL] [ORNL] [MDRES] [SSL]	8810 [PAL] [ORNL] [MDRES] [SSL]	15000 [PAL] [ORNL] [MDRES] [SSL]	7850 [PAL] [ORNL] [MDRES] [SSL]
7440-36-0	ANTIMONY	NA	0.27	0.033 UL	0.16 L	0.066 J	**0.73 L [PAL] [SSL]**	**0.66 L [PAL] [SSL]**	0.033 UL	0.033 UL	0.033 UL
7440-38-2	ARSENIC	14.9	0.026	0.74 [PAL] [ORNL] [MDRES] [MDSGW]	4.6 [PAL] [ORNL] [MDRES] [MDSGW]	4.0 L [PAL] [ORNL] [MDRES] [MDSGW]	8.0 L [PAL] [ORNL] [MDRES] [MDSGW]	7.9 L [PAL] [ORNL] [MDRES] [MDSGW]	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	2.0 [PAL] [ORNL] [MDRES] [MDSGW]	1.3 [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	46.2 K	48.7 K	40.7	71.0	99.6 [BKG]	45.0 K	59.9 K	41.4 K
7440-41-7	BERYLLIUM	1.1	16	0.43 J	0.57	0.61	0.59	0.68	0.46 J	0.75	0.53
7440-43-9	CADMIUM	2.5	0.36	0.08 U	0.1 J	0.082 U	0.2 J	0.27 K	0.079 U	0.082 U	0.082 U
7440-70-2	CALCIUM	2060	NA	1040 K	460 K	333	444	625	241 K	216 K	250 K
7440-47-3	**CHROMIUM**	33.4	**26**	13.9 K	23.8 K [PAL] [MDRES]	27.4 [PAL] [MDRES] [SSL]	23.3 [PAL] [MDRES]	24.5 [PAL] [MDRES]	13.6 K	23.2 K [PAL] [MDRES]	15.7 K
7440-48-4	COBALT	22.3	2.3	4.3 [PAL] [ORNL]	4.1 [PAL] [ORNL]	3.2 [PAL] [ORNL]	4.2 [PAL] [ORNL]	5.0 [PAL] [ORNL]	5.8 [PAL] [ORNL]	5.7 [PAL] [ORNL]	5.4 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	21.0 J [BKG]	14.2 J	8.1 J	**37.4 J [BKG] [PAL] [SSL]**	**41.2 J [BKG] [PAL] [SSL]**	4.8 J	6.8 J	5.3 J
7439-89-6	IRON	38500	5500	8060 [PAL] [ORNL] [MDRES] [SSL]	13900 [PAL] [ORNL] [MDRES] [SSL]	15000 [PAL] [ORNL] [MDRES] [SSL]	12600 [PAL] [ORNL] [MDRES] [SSL]	13800 [PAL] [ORNL] [MDRES] [SSL]	8970 [PAL] [ORNL] [MDRES] [SSL]	16200 [PAL] [ORNL] [MDRES] [SSL]	9710 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	15.7 [PAL] [SSL]	19.9 [PAL] [SSL]	11.3 [PAL] [SSL]	**78.3 [BKG] [PAL] [SSL]**	53.1 [PAL] [SSL]	19.2 [PAL] [SSL]	11.7 [PAL] [SSL]	18.1 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	5.5 [PAL] [OPLNT]	9.4 [PAL] [OPLNT]	9.1 [PAL] [OPLNT]	9.4 [PAL] [OPLNT]	9.5 [PAL] [OPLNT]	8.4 [PAL] [OPLNT]	14.1 [PAL] [OPLNT]	7.3 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	897	1470	1700 [BKG]	1280	1300	805	1300	920
7439-96-5	MANGANESE	1390	160	211 [PAL] [ORNL] [MDRES]	215 [PAL] [ORNL] [MDRES]	143	187 [PAL] [ORNL] [MDRES]	243 [PAL] [ORNL] [MDRES] [SSL]	198 [PAL] [ORNL] [MDRES]	112	185 [PAL] [ORNL] [MDRES]
7439-97-6	**MERCURY**	0.16	0.058	0.014 U	0.075 [PAL] [BTAG]	0.038 J	0.037	0.026 J	0.033 J	0.02 J	0.03 J
7440-02-0	NICKEL	15.4	38	6.7	9.0	10.5	8.0	10.3	6.6	8.3	7.3
7440-09-7	POTASSIUM	1470	NA	879	1880 [BKG]	2590 [BKG]	1890 [BKG]	1680 [BKG]	832	1310	904
7782-49-2	SELENIUM	1.2	0.52	0.033 U	0.065 UL	0.033 UL	0.054 J	0.067 J	0.033 U	0.066 U	0.033 U
7440-22-4	SILVER	0.84	4.2	0.08 UL	0.08 UL	0.082 UL	0.13 J	0.092 J	0.079 UL	0.082 UL	0.082 UL
7440-23-5	SODIUM	120	NA	18.7 J	25.5	26.1	30.5	31.2	31.8	38.1	20.9 J
7440-24-6	STRONTIUM	NA	120	5.4 K	9.3 K	9.5	22.4	40.3	4.9 K	5.7 K	4.4 K
7440-31-5	TIN	NA	0.89	0.8 U	0.81 U	0.82 U	3.4 [PAL] [BTAG]	2.1 J [PAL] [BTAG]	0.79 U	0.82 U	0.83 U
7440-62-2	VANADIUM	53.3	7.8	17.2 K [PAL] [MDRES] [SSL]	29.5 K [PAL] [MDRES] [SSL]	28.7 J [PAL] [MDRES] [SSL]	27.7 J [PAL] [MDRES] [SSL]	26.8 J [PAL] [MDRES] [SSL]	21.8 K [PAL] [MDRES] [SSL]	31.3 K [PAL] [MDRES] [SSL]	22.4 K [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	33.8 K	39.6 K [BKG]	31.5	**85.0 [BKG] [PAL] [SSL]**	**119 [BKG] [PAL] [SSL]**	21.9 K	26.6 K	22.3 K
	Miscellaneous Parameters										
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100										
TTNUS288	PERCENT MOISTURE (%)										
TTNUS002	PH (S.U.)	8.8									
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200									
TTNUS046	**TOTAL SOLIDS (%)**	79.2									

TABLE 13-4

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				a36	a37	a38	a39	a40	a41	a42
				036	037	038	039	040	041	042
				X28SS0170024	X28SS0180006	X28SS0180024	X28SS0190006	X28SS0190024	X28SS0200006	X28SS0200024
				X28SB017	X28SB018	X28SB018	X28SB019	X28SB019	X28SB020	X28SB020
				00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
				X28SS0170024	X28SS0180006	X28SS0180024	X28SS0190006	X28SS0190024	X28SS0200006	X28SS0200024
				20100121	20100120	20100120	20100120	20100120	20100121	20100121
				20100121	20100121	20100121	20100121	20100121	20100121	20100121
				NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
	matrix			SO	SO	SO	SO	SO	SO	SO
	duplicate									
	top_depth			0	0	0	0	0	0	0
	bottom_dep			2	0.5	2	0.5	2	0.5	2
	submatrix			SS	SS	SS	SS	SS	SS	SS
cas	sort	utl95val	minorpal	c_036	c_037	c_038	c_039	c_040	c_041	c_042
	Explosives (mg/kg)									
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.24 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.24 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
78-11-5	PETN	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	0.2 U	0.2 U	0.2 U	1.3	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	Inorganics (mg/kg)									
7429-90-5	ALUMINUM	19700	7700	9830 [PAL] [ORNL] [MDRES] [SSL]	18200 [PAL] [ORNL] [MDRES] [SSL]	16700 [PAL] [ORNL] [MDRES] [SSL]	12900 [PAL] [ORNL] [MDRES] [SSL]	14900 [PAL] [ORNL] [MDRES] [SSL]	9730 [PAL] [ORNL] [MDRES] [SSL]	14600 [PAL] [ORNL] [MDRES] [SSL]
7440-36-0	ANTIMONY	NA	0.27	0.033 UL	0.16 UL	0.11 L	0.099 L	0.16 J	0.14 J	0.091 J
7440-38-2	ARSENIC	14.9	0.026	1.7 [PAL] [ORNL] [MDRES] [MDSGW]	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	3.6 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	3.6 [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	55.6 K	77.0 K	57.5 K	62.3 K	50.4 K	41.5 K	49.0 K
7440-41-7	BERYLLIUM	1.1	16	0.71	0.72	0.7 J	0.61	0.55	0.57	0.76 J
7440-43-9	CADMIUM	2.5	0.36	0.081 U	0.082 U	0.15 U	0.095 J	0.079 U	0.1 J	0.16 U
7440-70-2	CALCIUM	2060	NA	187 K	846 K	555 K	813 K	541 K	306 K	247 K
7440-47-3	**CHROMIUM**	33.4	**26**	21.2 K	22.6 K	27.8 K [PAL] [MDRES] [SSL]	26.2 K [PAL] [MDRES] [SSL]	25.0 K [PAL] [MDRES]	17.7 K	29.1 K [PAL] [MDRES] [SSL]
7440-48-4	COBALT	22.3	2.3	5.6 [PAL] [ORNL]	7.3 [PAL] [ORNL]	4.9 [PAL] [ORNL]	4.9 [PAL] [ORNL]	3.3 [PAL] [ORNL]	4.2 [PAL] [ORNL]	5.3 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	6.4 J	9.9 J	9.1 J	13.4 J	9.2 J	16.0 J	22.3 J [BKG]
7439-89-6	IRON	38500	5500	13800 [PAL] [ORNL] [MDRES] [SSL]	16400 [PAL] [ORNL] [MDRES] [SSL]	18500 [PAL] [ORNL] [MDRES] [SSL]	14000 [PAL] [ORNL] [MDRES] [SSL]	14500 [PAL] [ORNL] [MDRES] [SSL]	11300 [PAL] [ORNL] [MDRES] [SSL]	20200 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	13.4 [PAL] [SSL]	54.0 [PAL] [SSL]	25.9 [PAL] [SSL]	36.5 [PAL] [SSL]	60.6 [PAL] [SSL]	32.7 [PAL] [SSL]	21.2 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	9.8 [PAL] [OPLNT]	16.5 [PAL] [ORNL] [OPLNT]	13.9 [PAL] [OPLNT]	9.6 [PAL] [OPLNT]	8.8 [PAL] [OPLNT]	7.7 [PAL] [OPLNT]	11.7 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	1250	1400	1620	1490	1490	902	1460
7439-96-5	MANGANESE	1390	160	153	215 [PAL] [ORNL] [MDRES]	136	298 [PAL] [ORNL] [MDRES] [SSL]	124	121	112
7439-97-6	**MERCURY**	0.16	0.058	0.02 J	**0.85 [BKG] [PAL] [BTAG]**	**0.33 [BKG] [PAL] [BTAG]**	0.094 [PAL] [BTAG]	0.065 [PAL] [BTAG]	0.036 J	0.036 J
7440-02-0	NICKEL	15.4	38	9.5	13.7	9.9	11.5	9.6	6.8	9.7
7440-09-7	POTASSIUM	1470	NA	1210	1570 [BKG]	1970 [BKG]	1810 [BKG]	2040 [BKG]	1090	1920 [BKG]
7782-49-2	SELENIUM	1.2	0.52	0.033 U	0.066 U	0.066 U	0.065 U	0.065 U	0.075 J	0.065 U
7440-22-4	SILVER	0.84	4.2	0.081 UL	0.082 UL	0.15 UL	0.083 UL	0.079 UL	0.083 UL	0.16 UL
7440-23-5	SODIUM	120	NA	25.1	53.1	33.4 J	29.0	21.9 J	24.6 J	38.6 J
7440-24-6	STRONTIUM	NA	120	4.6 K	13.0 K	11.2 K	7.0 K	5.2 K	6.2 K	6.5
7440-31-5	TIN	NA	0.89	0.98 J [PAL] [BTAG]	0.82 U	1.5 U	0.83 U	0.79 U	0.83 U	1.6 U
7440-62-2	VANADIUM	53.3	7.8	28.7 K [PAL] [MDRES] [SSL]	36.6 K [PAL] [MDRES] [SSL]	36.6 K [PAL] [MDRES] [SSL]	28.0 K [PAL] [MDRES] [SSL]	26.3 K [PAL] [MDRES] [SSL]	23.9 K [PAL] [MDRES] [SSL]	34.4 K [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	28.7 K	**53.4 K [BKG] [PAL] [SSL]**	38.5 K [BKG]	**89.3 K [BKG] [PAL] [SSL]**	**91.8 K [BKG] [PAL] [SSL]**	35.5 K	44.8 K [BKG]
	Miscellaneous Parameters									
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100								127	
TTNUS288	PERCENT MOISTURE (%)								36.1	
TTNUS002	PH (S.U.)	8.8							5.8	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200							12000	
TTNUS046	**TOTAL SOLIDS (%)**	79.2							63.9	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

P:/GIS/INDIANHEAD_NSWC_NEW/MAPDOCS/MXD/SN_EOD_SCHOOL_MEC.MXD 4/16/10 KM

DRAWN BY	DATE
K. MOORE	8/24/07
CHECKED BY	DATE
E. BERKLITE	4/16/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

EOD SCHOOL DEMOLITION AREA (UXO-28)
MEC INVESTIGATION LOCATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 13-1	0

P:/GIS/INDIANHEAD_NSWC_NEW/MXD/SN_EOD_SCHOOL_MEC_FINDS.MXD 4/16/10 KM

1249000 1249500 1250000

323000

322500

Archer Avenue

Former Ready Bunker Area

N

Legend

- MPPEH
- MRP Area Boundary Identified During PA
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

100 50 0 100 Feet

DRAWN BY	DATE
K. MOORE	1/14/10
CHECKED BY	DATE
E. BERKLITE	4/16/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

EOD SCHOOL DEMOLITION AREA (UXO-28)
MEC FINDS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 13-2	0

P:/GIS/INDIANHEAD_NSWC_NEW/MXD/SN_EOD_SCHOOL_MAG.MXD 7/12/10 KM

1249000 1249500 1250000

323000

Archer Avenue

CWAP indicated possible utilities along this transect.

Former Ready Bunker Area

N

355 315 288 263 247 232 220 208 196 186 176 165 156 147 138 130 121 113 105 95 87 79 70 62 53 44 35 24 14 4 -8 -20 -32 -47 -64 -88 -115 -155

Vertical Magnetic Gradient
Analytic Signal

Legend

- Buried Ferrous Metallic Items (with unique identifier) 110 anomalies identified
- Surface Metals (non-muntions related)
- MRP Area Boundary Identified During PA
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

NOTE: Geometrics G-858G data shown.

80 40 0 80 Feet

DRAWN BY	DATE
K. MOORE	1/14/10
CHECKED BY	DATE
E. BERKLITE	7/12/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

EOD SCHOOL DEMOLITION AREA (UXO-28)
GEOPHYSICAL ANOMALIES LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 13-3	0

1249000 1249500 1250000

P:/GIS/INDIANHEAD_NSWC_NEW/MAPDOCS/MXD/SN_EOD_SCHOOL_EM61.MXD 7/12/10 KM

1249500 1249750

323000

N

Former Ready Bunker Area

EODSA)

fuze part 100 percent

NOTE: Geonics EM61-MK2

Legend

- GPS Sample Location
- Buried Ferrous Metallic Items (with unique identifier) 57 Anomalies Identified
- Surface Metals (non-muntions related)
- MRP Area Boundary Identified during PA
- Surface Drainage
- Topographic Contour (5-ft interval)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

EM61 Response (millivolts)
97 95 92 90 87 85 82 79 77 74 72 69 67 64 62 59 56 54 51 49 46 44 41 38 36 33 31 28 26 23 21 18 15 13 10 8 5 3

30 15 0 30 Feet

DRAWN BY	DATE
K. MOORE	12/23/09
CHECKED BY	DATE
E. BERKLITE	7/12/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

EOD SCHOOL DEMOLITION AREA (UXO-28)
GEOPHYSICAL ANOMALIES INSET LOCATIONS
EM61 COLOR CONTOUR MAP
AND INTERPRETATION
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 13-3A	0

P:/GIS/INDIANHEAD_NSWC_NEW/MXD/SN_EOD_SCHOOL_SAMPLING.MXD 7/12/10 KM

1249000 1249500 1250000

323000

Archer Avenue

Former Ready Bunker Area

N

X28SB001 X28SB002 X28SB003 X28SB004 X28SB005 X28SB006 X28SB007 X28SB008 X28SB009 X28SB010 X28SB011 X28SB012 X28SB013 X28SB014 X28SB015 X28SB016 X28SB017 X28SB018 X28SB019 X28SB020

355 315 288 263 247 232 220 208 196 186 176 165 156 147 138 130 121 113 105 95 87 79 70 62 53 44 35 24 14 4 -8 -20 -32 -47 -64 -88 -115 -155

Vertical Magnetic Gradient
Analytic Signal

Legend

- Soil Sample Location
- MPPEH
- Buried Ferrous Metallic Items (with unique identifier)
- Surface Metals (non-muntions related)
- MRP Area Boundary Identified During PA
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

NOTE: Geometrics G-858G data shown.

80 40 0 80 Feet

DRAWN BY	DATE
K. MOORE	1/14/10
CHECKED BY	DATE
E. BERKLITE	7/12/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

EOD SCHOOL DEMOLITION AREA (UXO-28)
SAMPLE LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 13-4	0

1249000 1249500 1250000

P:/GIS/INDIANHEAD_NSWC_NEW/MXD/SN_EOD_SCHOOL_SS_TAGS.MXD 7/9/10 KM

1249000 1249500 1250000

323000

322500

N

X28SB002
Depth= 0 - 0.5'
Inorganics (mg/kg)
ZINC 55.2 [BKG] [PAL] [SSL]

X28SB001
NO EXC

X28SB005
Depth= 0 - 0.5'
X28SB005 (DUP)
Inorganics (mg/kg)
SILVER 19.5 J [BKG] [PAL] [SSL]
COPPER 33.1 J [BKG] [PAL] [SSL]
LEAD 189 J [BKG] [PAL] [SSL]

X28SB004
NO EXC

Former Ready Bunker Area

X28SB007
Depth= 0 - 0.5'
Inorganics (mg/kg)
COPPER 34.9 J [BKG] [PAL] [SSL]
LEAD 198 [BKG] [PAL] [SSL]
Depth= 0 - 2'
COPPER 29.0 J [BKG] [PAL] [SSL]
LEAD 122 [BKG] [PAL] [SSL]

X28SB006
Inorganics (mg/kg)
Depth= 0 - 2'
COPPER 54.7 J [BKG] [PAL] [SSL]

X28SB012
NO EXC

X28SB003
Depth= 0 - 0.5'
Inorganics (mg/kg)
CHROMIUM 40.0 [BKG] [PAL] [MDRES] [SSL]
MAGNESIUM 7480 [BKG] [PAL] [BTAG]
ZINC 56.5 [BKG] [PAL] [SSL]

X28SB011
NO EXC

X28SB013
Depth= 0 - 0.5'
Inorganics (mg/kg
COPPER 44.5 J [BKG] [PAL] [SSL]

X28SB009
NO EXC

X28SB008
Depth= 0 - 0.5'
Inorganics (mg/kg)
CHROMIUM 35.0 [BKG] [PAL] [MDRES] [SSL]
Depth= 0 - 2'
CHROMIUM 38.2 [BKG] [PAL] [MDRES] [SSL]

X28SB010
Depth= 0 - 0.5'
Inorganics (mg/kg)
COPPER 50.0 J [BKG] [PAL] [SSL]
LEAD 112 [BKG] [PAL] [SSL]
ZINC 464 [BKG] [PAL] [SSL]
Depth= 0 - 2'
COPPER 30.5 J [BKG] [PAL] [SSL]
ZINC 483 [BKG] [PAL] [SSL]

X28SB014
NO EXC

X28SB016
NO EXC

X28SB017
NO EXC

X28SB018
Depth= 0 - 0.5'
Inorganics (mg/kg)
MERCURY 0.85 [BKG] [PAL] [BTAG]
ZINC 53.4 K [BKG] [PAL] [SSL]
Depth= 0 - 2'
MERCURY 0.33 [BKG] [PAL] [BTAG]

X28SB015
Depth= 0 - 0.5'
Inorganics (mg/kg)
COPPER 37.4 J [BKG] [PAL] [SSL]
LEAD 78.3 [BKG] [PAL] [SSL]
ZINC 85.0 [BKG] [PAL] [SSL]
Depth= 0 - 2'
COPPER 41.2 J [BKG] [PAL] [SSL]
ZINC 119 [BKG] [PAL] [SSL]

X28SB020
NO EXC

X28SB019
Depth= 0 - 0.5'
Inorganics (mg/kg)
ZINC 89.3 K [BKG] [PAL] [SSL]
Depth= 0 - 2'
ZINC 91.8 K [BKG] [PAL] [SSL]

5

Legend

- Soil Boring Location
- MRP Area Boundary Identified During PA
- Surface Drainage
- Topographic Contour (5-ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

100 50 0 100
Feet

DRAWN BY	DATE
K. MOORE	5/18/10
CHECKED BY	DATE
E. BERKLITE	7/9/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

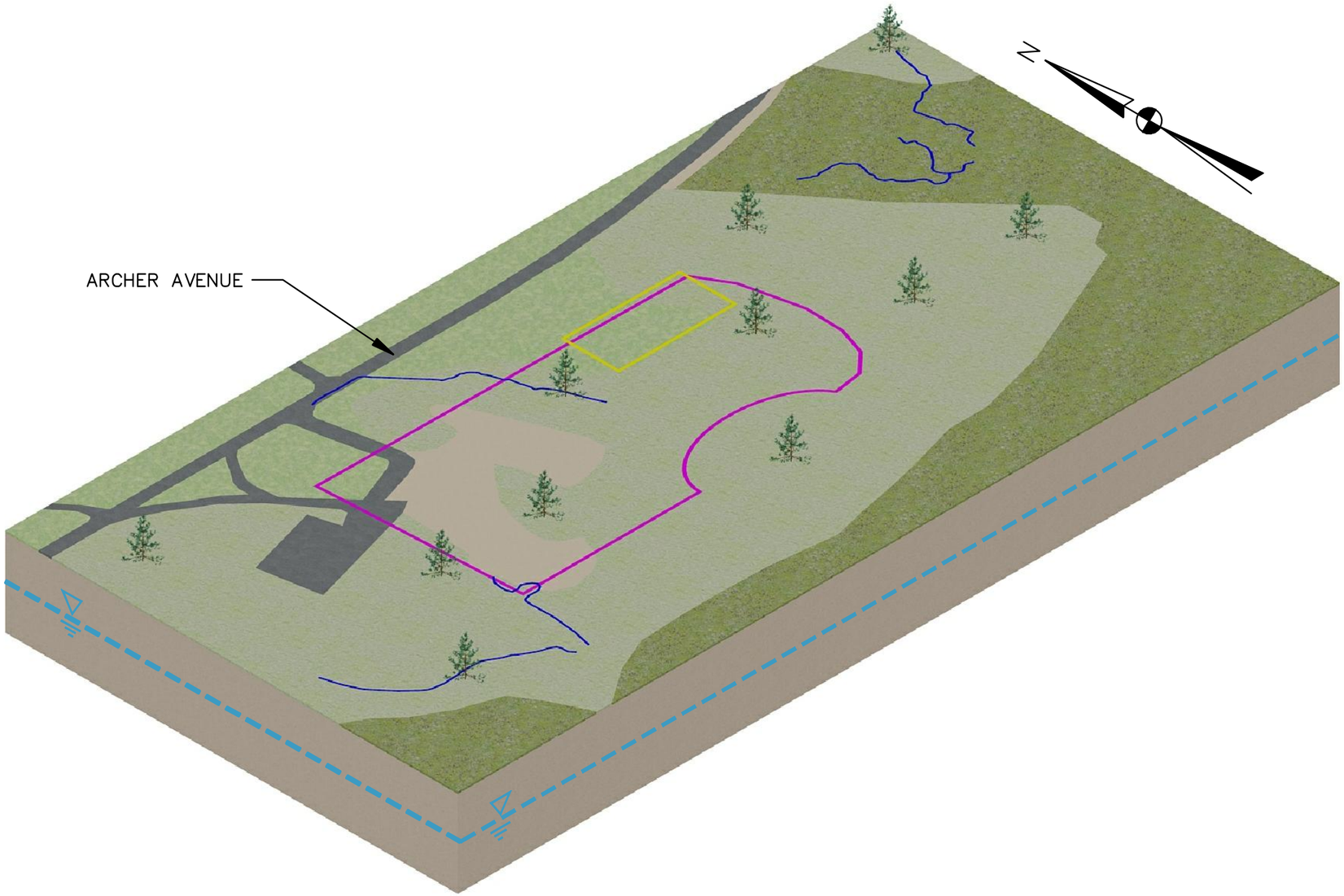
NAVFAC

EOD SCHOOL DEMOLITION AREA (UXO-28)
SURFACE SOIL METALS EXCEEDANCES
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 13-5	0

LEGEND

- MRP AREA BOUNDARY IDENTIFIED DURING PA
- FORMER READY BUNKER AREA
- SURFACE DRAINAGE
- WATER TABLE (ESTIMATED)
- BUILDINGS
- TREE
- GRASS
- PAVED ROAD
- FOREST
- WETLANDS



CURRENT AND FUTURE RECEPTORS FOR STUMP NECK IMPACT AREA
HUMAN: –MILITARY/CIVILIAN PERSONNEL –CONTRACTORS –TRESPASSERS
ECOLOGICAL: –PLANTS –INVERTEBRATES –BIRDS –MAMMALS

AT 18 SAMPLING LOCATIONS, ONE OR MORE OF THE FOLLOWING METALS WAS EXCEEDED
–ANTIMONY –CHROMIUM –COPPER –LEAD –MAGNESIUM –MERCURY –SILVER –ZINC

DRAWN BY / DATE	ND 6–10–10
CHECKED BY / DATE	
REVISED BY / DATE	
SCALE	NOT TO SCALE

NAVFAC

EOD SCHOOL DEMOLITION AREAS UXO–28 CONCEPTUAL SITE MODEL NAVAL SUPPORT FACILITY STUMP NECK ANNEX INDIAN HEAD, MARYLAND

CONTRACT NO.	0810
OWNER NO.	
APPROVED BY / DATE	
DRAWING NO.	FIGURE 13–6
REV.	0

R:\0810\CSM\0810CSM009.dwg PIT NICHOLE.DILLA 7/1/2010 7:58:25 AM

FIGURE 13-7A

MEC EXPOSURE PATHWAY ANALYSIS

EOD SCHOOL DEMOLITION AREA

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

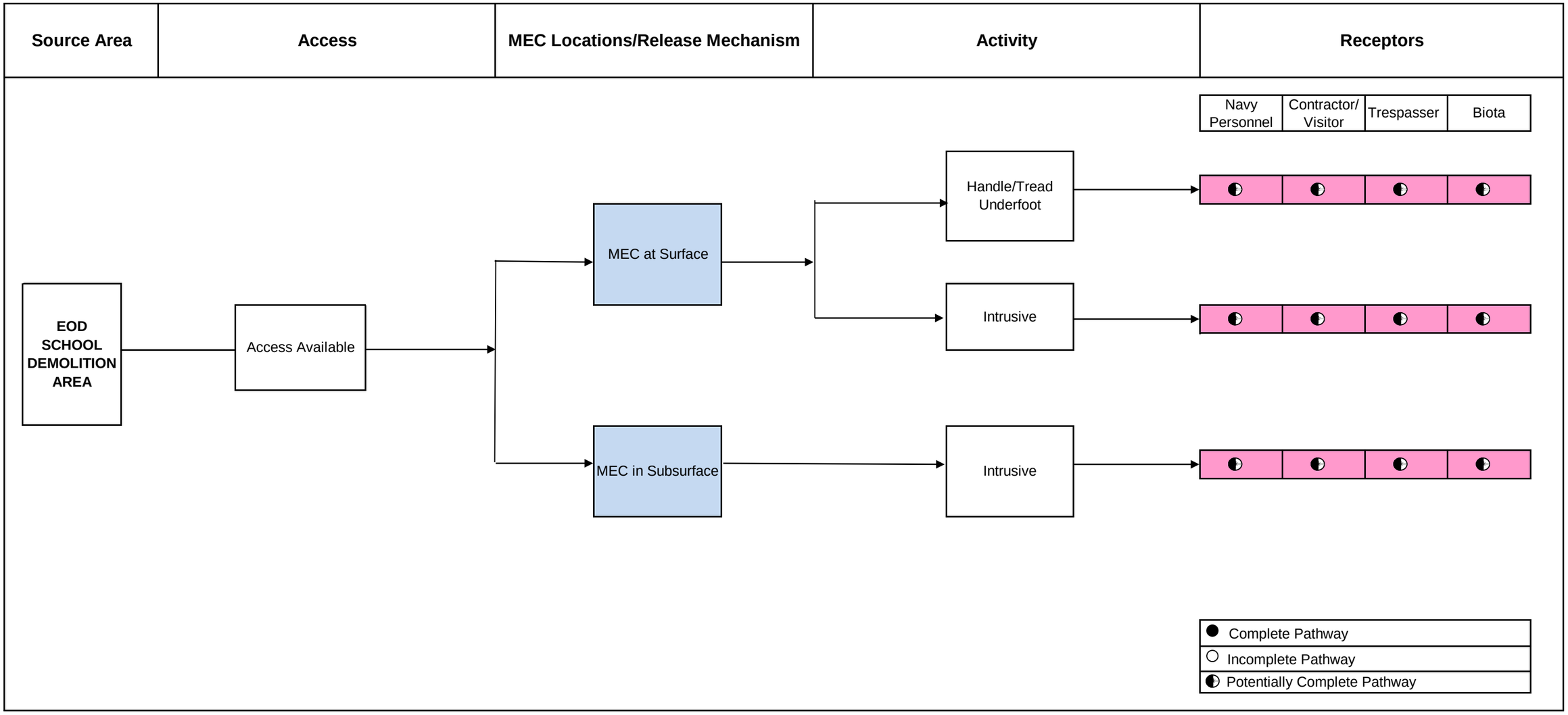
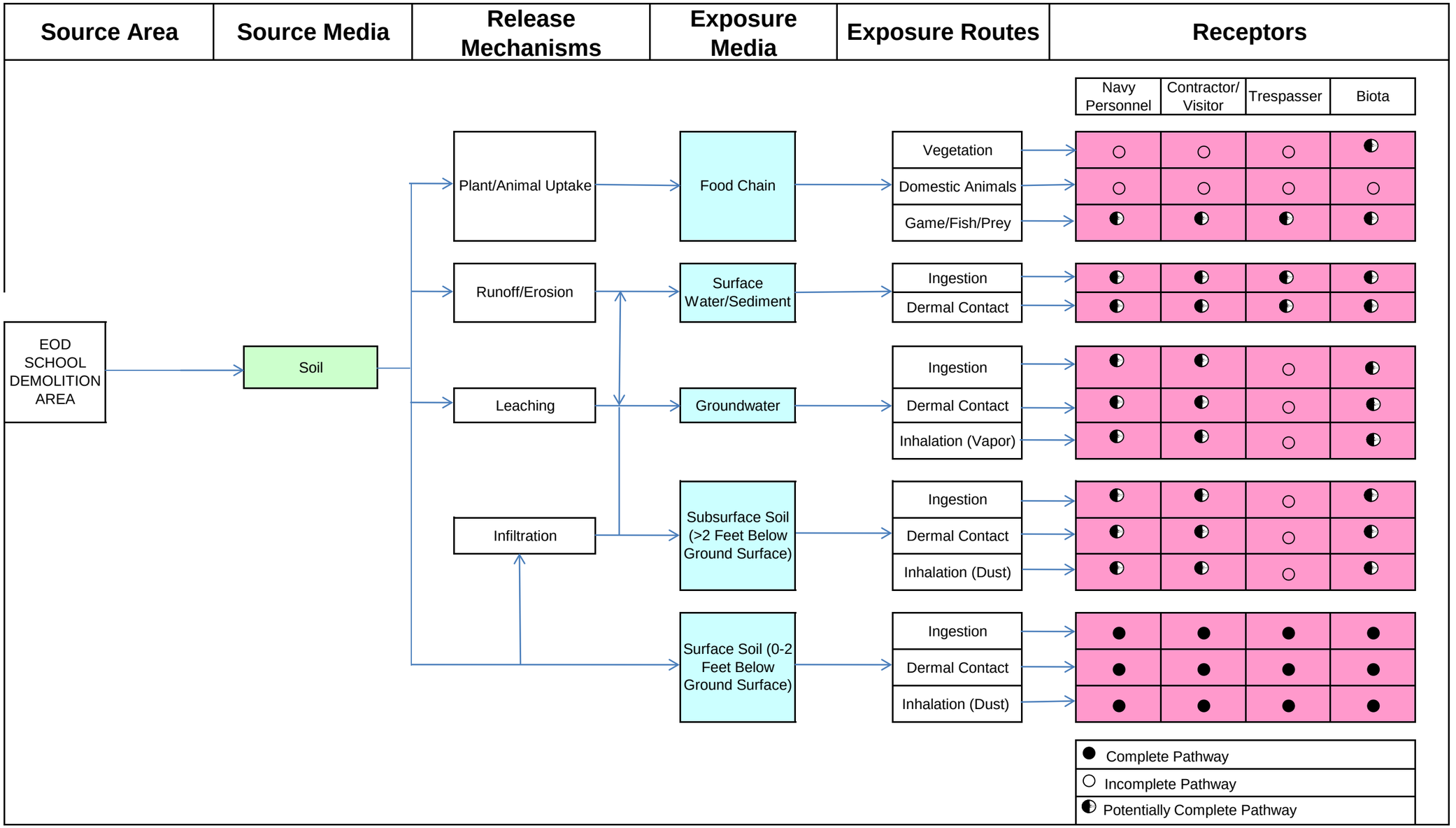


FIGURE 13-7B

MC EXPOSURE PATHWAY ANALYSIS

EOD SCHOOL DEMOLITION AREA UXO 28

NSF INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND



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APPENDIX A

SOPS
(ON CD)

LIST OF SOPS FOR MC SAMPLING

Reference Number	Title, Revision Date and/or Number	Originating Organization of Sampling SOP	Equipment Type	Modified for Project Work? (Y/N)	Comments
SOP-01	Sample Labeling	Tetra Tech	NA	N	Contained in Appendix D (UFP SAP)
SOP-02	Sample Identification Nomenclature	Tetra Tech	NA	N	Contained in Appendix D (UFP SAP)
SOP-03	Sample Custody and Documentation of Field Activities	Tetra Tech	Field logbook, sample log sheets, boring logs	N	Contained in Appendix D (UFP SAP)
SOP-04	Decontamination of Field Sampling Equipment	Tetra Tech	Decontamination equipment, scrub brushes, 5-gallon buckets, spray bottles, phosphate free detergent, DI water	N	Contained in Appendix D (UFP SAP)
SOP-05	Soil Coring and Sampling Using Hand Auger Techniques	Tetra Tech	Stainless steel auger bucket, extension rods, and T-handle	N	Contained in Appendix D (UFP SAP)
SOP-06	Borehole Advancement and Soil Coring for Soil SamplingUsing	Tetra Tech	Drilling rig and accessories	N	Contained in Appendix D (UFP SAP)

	Direct-Push Technology				
SOP-07	Surface Water Sampling	Tetra Tech	Multi-parameter water quality meter, turbidity meter, peristaltic pump, silicone tubing, 0.45 µ filter	N	Contained in Appendix D (UFP SAP)
SOP-08	Sediment Sampling	Tetra Tech	Stainless steel or disposable trowels	N	Contained in Appendix D (UFP SAP)
SOP-09	Management of Investigation-Derived Waste	Tetra Tech	NA	N	Contained in Appendix D (UFP SAP)
SOP-10	Borehole and Soil Sample Logging	Tetra Tech	NA	N	Contained in Appendix D (UFP SAP)
Contained in Appendix D	SOP-15	Monitoring Well Development	Tetra Tech	Surge block, stainless steel bailer, bailer rope, 12vdc submersible pump, surface pump, multi-parameter water quality meter, water level meter, water containers	N
SOP-16	Temporary Monitoring Well	Tetra Tech	Drilling rig and accessories	N	Contained in Appendix D

LIST OF SOPS FOR MC SAMPLING

	Installation				(UFP SAP)
SOP-17	Low-Flow Well Purging and Stabilization	Tetra Tech	12vdc submersible pump, peristaltic surface pump, multi-parameter water quality meter, water level meter, water containers,	N	Contained in Appendix D (UFP SAP)
SOP-18	Groundwater Sampling	Tetra Tech	12vdc submersible pump, peristaltic surface pump, multi-parameter water quality meter, water level meter, water containers, sample containers	N	Contained in Appendix D (UFP SAP)
SOP-11	Sample Preservation, Packaging, and Shipping	Tetra Tech	NA	N	Contained in Appendix D (UFP SAP)
SOP-12	Calibration and Care of Water Quality Meter	Tetra Tech	Multi-parameter water quality meter	N	Contained in Appendix D (UFP SAP)
SOP-13	Measurement of Water Levels in Monitoring Wells	Tetra Tech	Water level meter	N	Contained in Appendix D (UFP SAP)

LIST OF SOPS FOR MC SAMPLING

SOP-14	Inspection of Existing Monitoring Wells	Tetra Tech	Hand tools	N	Contained in Appendix D (UFP SAP)
SOP-19	Composite Sampling for Soil and Sediment	Tetra Tech	Stainless steel trowels and mixing bowls	N	Contained in Appendix D (UFP SAP)
SOP-20	Calibration and Use of Photoionization Detector	Tetra Tech	Photoionization air meter	N	Contained in Appendix D (UFP SAP)
SOP-21	MEC Management and Accountability	Tetra Tech	Metal Detector	N	Contained in Appendix D (UFP SAP)
SOP-22	Global Positioning System	Tetra Tech	GPS unit	N	Contained in Appendix D (UFP SAP)

APPENDIX A

STANDARD OPERATING PROCEDURES

TABLE OF CONTENTS

SOPs

OPS1	UXO Detector-Aided Surface Sweeps
OPS2	Geophysical Survey
OPS3	Geophysical Data Processing and Analysis
OPS4	MEC Management and Accountability
OPS5	Global Positioning System
SOP-06	Vegetation Management at MEC Sites

STANDARD OPERATING PROCEDURE
SOP OPS1

UXO DETECTOR-AIDED SURFACE SWEEPS

1.0 SCOPE AND APPLICABILITY

This document is designed to set a standard operating procedure (SOP) for the detector-aided surface sweep field operations during activities performed under the Munitions Response Program (MRP). This SOP is not site-specific, but rather is intended as a general guidance document for a variety of sites and conditions.

2.0 BACKGROUND

Detector-aided surface sweep activities will be performed in accordance with all local, State, and federal regulations and will include all applicable DoD requirements. The scope of the detector-aided surface sweep activities for a specific site will be defined in the project-specific work plans. Generally, all areas identified as suspect for munitions and explosives of concern (MEC) will receive an Unexploded Ordnance (UXO) detector-aided surface sweep UXO detector-aided surface sweep operations may be used as a stand-alone method for site survey and assessment or in preparation for geophysical survey operations. UXO escort operations will be required during site visits (initial site assessments, planning, and stakeholders meetings), geophysical operations, and MC sampling operations and any other time where non-UXO trained personnel are conducting work in an MEC site. This SOP does not address UXO escort operations. UXO escort operations are addressed in the Munitions and Explosives of Concern and Chemical Warfare Agents Activities SOP which will be attached to the site-specific health and safety plans (HASPs) for those activities.

3.0 PERSONNEL QUALIFICATIONS

UXO personnel conducting detector-aided surface sweeps shall be graduates of a military Explosive Ordnance Disposal (EOD) School of the United States, Canada, Great Britain, Germany, or Australia or a graduate of a formal training course of instruction or EOD assistant course as stated in DDESB TP-18.

UXO Senior UXO Supervisor (SUXOS)

The SUXOS will have a minimum of ten years experience in all aspects of munitions response actions or range clearance activities. A minimum of five years of the experience shall be in supervisory positions.

UXO Team Leader (UXO Technician III)

The UXO Team Leader will have a minimum of 8 years of EOD/UXO experience including prior military EOD and/or commercial UXO experience in munitions response actions, and/or range clearance activities. The UXO Team Leader may supervise up to six UXO technicians. The UXO Team Leader will conduct detector-aided surface sweep activities as directed by the project manager (PM) and UXO Manager. The UXO Team Leader will be under the direct supervision of the UXO Manager.

UXO Quality Control Specialist (UXOQC)

The UXOQC specialist shall have a minimum of 8 years experience in all phases of munitions response actions and/or range clearance activities.

UXO Safety Officer (UXOSO)

The UXOSO shall have a minimum of 8 years experience in all phases of munitions response actions and/or range clearance activities. The UXOSO will brief the team on the hazards and other issues associated with the definable features of work planned for the day. This briefing will be documented on the attached Tailgate Safety Briefing form.

UXO Technicians II

The UXO Technicians II will have prior military EOD experience or a minimum of 3 years of experience in munitions response actions and/or range clearance activities. The UXO technician will conduct detector-aided surface sweep activities as directed by the UXO Team Leader.

UXO Technician I

The UXO Technician I will have training as specified in DDESB TP-18. The UXO technician I will be directly supervised by a UXO Technician III or higher when conducting UXO activities.

4.0 DETECTOR-AIDED SURFACE SWEEP OPERATIONS

Equipment

A magnetic locator such as the Schonstedt, GA-52Cx instrument or equivalent and/or an all-metal detector such as the White's XLT or equivalent will be used for detector-aided surface sweep operations. The detection depth of the instrument is limited by size and orientation of a target and soil characteristics of the work area. The locators provide an audio signal for response, but do not store data. The magnetic locator does not need to be calibrated. The all-metal detector has field calibration. Calibration settings are specific to the make and model of the all metals detector. Table 1 lists the calibration settings for the White's spectrum XLT.

To ensure each detector is operating properly, the operator turns on the instrument and slowly moves the locator towards metal. As the probe advances toward the target, the audio signal will increase. Failure to detect the object is reason to reject the instrument. The operator will complete the attached Equipment Maintenance/Repair Form to address equipment failure and corrective actions taken.

1) The detector will be checked daily before starting detector-aided surface sweep activities and after any battery change.

2) The normal daily check for detector-aided surface sweep operations is the blanket test.

3) To conduct the blanket test, an area near the work site that is free of anomalies will be identified.

4) The senior UXO Technician or UXOQC will position several inert munitions, or surrogate munitions items on the surface and cover the items with a tarpaulin or similar cover so the items are not visible to the UXO technician. Each UXO technician will conduct a detector aided surface sweep of the blanket test area and locate the test items. The senior UXO technician or UXOQC will compare the results of the test to the actual placement of the items and make corrections as necessary. UXO Technicians will also conduct random checks during daily operations. The operator will complete the attached Equipment Utilization Log for each detector tested.

The normal setting for the Schonstedt instrument is 2; setting the instrument to 3 or 4 will make it more sensitive and setting the instrument to 1 will make it less sensitive. The instrument will not detect copper, brass, or aluminum munitions. The normal setting for the White's all-metal detector will vary according to site conditions.

UXO Detector-Aided Surface Sweep

The objective of the UXO detector-aided surface sweep is to locate suspect MEC. Materials potentially presenting an explosive hazard (MPPEH) and munitions debris (MD) on the ground surface in a munitions response site, (MRS). Early in the planning for the field activities, usually during the DQO process with the regulators and the client, the level of effort is determined for each MRS within a munitions response area, MRA). The level of effort can vary from a 100% UXO investigation where the entire foot print of the MRS receives a UXO detector-aided surface sweep, to transects where five foot wide lanes receive a UXO detector-aided surface sweep and each lane is separated by a set number of feet depending on the budget and size of the MRS, or even a meandering path where a UXO detector-aided surface sweep is conducted as the UXO technician meanders across the MRS. Each of these will be discussed in some detail below:

100% UXO Detector-aided Surface Sweep

The first step in conducting a 100% UXO detector-aided surface sweep is to identify the boundaries of the MRS. This can be done with a GPS with preloaded grid coordinates, or surveyed by a land surveyor.

The next step is to remove brush and small trees within the MRS to allow access to the locations where the surface sweep is to be conducted. The degree of removal will depend on site-specific conditions. This can be accomplished with a bush cutting crew and a UXO escort, or the UXO team can conduct the brush cutting themselves depending on the size of the area and the amount of brush removal needed. Care must be taken to ensure that personnel do not disturb suspect MEC, MPPEH or munitions debris on the surface that may be obscured by vegetation

The next step is to establish a grid system across the MRS. The normal grid is 100ft X 100ft but may be larger or smaller if the MRS would be better covered with a different size. The grid is established using a GPS with preloaded grid corners, or surveyed by a land surveyor to establish the grid corners.

The next step in the set-up process is to divide each grid into search lanes. This is normally done by running a tape measure between the bottom and top east/west corner stakes. Then the UXO team will run rope lines from the 0 point on one tape to the 0 point on the other tape, from the 5ft point on one tape to the 5ft point on the next tape, and so on until the entire 100 ft grid has been divided in to lanes.

The UXO team members will now start the UXO detector-aided surface sweep of each lane. Each UXO team member will start at one of the tapes and using the metal detector, proceed toward the other tape and locate any surface MEC within their lane. If suspect MEC is encountered, its location will be recorded and/or marked using a GPS, tape measure, or other grid coordinate location system. The UXO Team will attempt to determine its condition without moving or disturbing the item prior to proceeding with the surface sweep. Each item will be marked with engineer flagging and given a unique ID number (See MEC Management and Accountability SOP). All available information about the item will be recorded in the logbook/MEC Accountability Log, including suspect MEC location, identification, and ID number. A digital photograph will be taken of each item. The UXO Team will not move or otherwise disturb the item in an attempt to collect information. After all available information is recorded; the UXO Team will resume the detector-aided surface sweep.

When the UXO detector-aided surface sweep of a grid is complete and all items have been located with coordinates and digitally photographed, the tape measures, ropes and other equipment will be moved to the next grid and reestablished as stated above. This process will continue until the entire MRS has been investigated with as close as possible to 100% UXO detector-aided surface sweep.

Transect UXO Detector-aided Surface Sweep

The first step in conducting a transect UXO detector-aided surface sweep is to identify the boundaries of the MRS. This can be done with a GPS with preloaded grid coordinates, or surveyed by a land surveyor.

The next step is to establish the end stakes of each transect across the MRS. The transect end stakes are established using a GPS with preloaded end stake locations, or surveyed by a land surveyor. The distance between transects will be established in the site-specific work plan. The direction should be either north/south, or east west although other directions may be appropriate in specific circumstances. If a geophysical survey using a magnetometer is to follow the detector-aided surface sweep, the direction of the transects should be north/south because the magnetometer operates on the principle of the Earth's polarity.

If necessary, each transect may require some brush cutting to aid in the surface sweep. If brush cutting is determined to be necessary, the transect should be at least 5 ft. wide. This can be accomplished with a bush cutting crew and a UXO escort, or the UXO team can conduct the brush cutting themselves depending on the size of the area and the amount of brush removal needed. Care must be taken to ensure that personnel do not disturb suspect MEC items on the surface that may be obscured by brush and tall grass.

The UXO team members will now start the UXO detector-aided surface sweep of each transect. Each UXO team member will start at one of the end stakes and using the metal detector proceed in a deliberate pattern to locate any surface MEC within their 5ft wide transect, toward the other corresponding end stake. The UXO team member will use a GPS or compass to maintain a generally straight transects during the investigation. If suspect MEC is encountered, its location will be recorded and/or marked using a GPS, tape measure, or other grid coordinate location system. The UXO Team will attempt to determine its condition without moving or disturbing the item prior to proceeding with the surface sweep. Each item will be marked with engineer flagging and given a unique ID number (See MEC Management and Accountability SOP). All available information about the item will be recorded in the logbook/MEC Accountability Log, including suspect MEC location, identification, and ID number. A digital photograph will be taken of each item. The UXO Team will not move or otherwise disturb the item in an attempt to collect information. After all available information is recorded; the UXO Team will resume the detector-aided surface sweep.

When the UXO detector-aided surface sweep of a transect is complete and all items have been located with coordinates and digitally photographed, the UXO team member may proceed to the next transect. This process will continue until the transects have been completed over the entire MRS as planned in the WP.

Meandering Path UXO Detector-aided Surface Sweep

Generally the meandering path UXO detector-aided surface sweep is very similar to the transect UXO detector-aided surface sweep. The main difference is there is very little need to cut brush as the UXO team members will meander around heavy brush and other obstacles.

The GPS will have information about the MRS preloaded so as to ensure that the path stays within the MRS. Again the meandering path will be approximately 5ft wide and proceed across the MRS until the objective, (a set amount of time, distance, or suspect MEC items) have been investigated with the UXO detector-aided surface sweep. The site-specific work plans will establish the area within the MRS to be covered with the meandering transects.

If suspect MEC is encountered, its location will be recorded and/or marked using a GPS, compass, and/or tape measure, or other grid coordinate location system. The UXO Team will attempt to determine its condition without moving or disturbing the item prior to proceeding with the surface sweep. Each item will be marked with engineer flagging and given a unique ID number (See MEC Management and

Accountability SOP). All available information about the item will be recorded in the logbook/MEC Accountability Log, including suspect MEC location, identification, and ID number. A digital photograph will be taken of each item. The UXO Team will not move or otherwise disturb the item in an attempt to collect information. After all available information is recorded; the UXO Team will resume the detector-aided surface sweep.

Every effort will be made to identify each suspect MEC or MPPEH item located. Under no circumstances will any suspect MEC be moved in an attempt to make a definitive identification. The MEC item will be visually examined for markings and other external features such as shape, size, and external fittings. If unknown military munitions are encountered, the facility point of contact (POC) and Tetra Tech UXO Manager will be notified.

Only UXO-qualified personnel will perform MEC identification procedures. As an exception, a UXO Technician I may assist in the performance of MEC identification procedures when under the supervision of a UXO Technician III or higher. All personnel engaged in field operations will be thoroughly trained and capable of recognizing the specific hazards of the procedures being performed. To ensure that these procedures are performed to standards, all field personnel will be under the direct supervision of a UXO Technician III or higher. All suspect MEC items will be recorded following the requirements of this SOP, the site-specific Work Plan/QAPP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures.

All munitions-related items discovered during the detector-aided surface sweep of the transects/grid will be left in place. No MEC will be moved during this part of the project. The facility POC will be notified of the presence of MEC so that arrangements may be made through the facility for proper disposition of the item(s). If the facility initiates an emergency response or disposal action, follow-up documentation must be obtained to detail the date and method of disposition. This is also needed to ascertain the actual type and condition of the item (live or inert filled) to aid in future classification of the site.

Quality Control

The UXOQC will review the definable features of work prior to the start of work each day. A new definable feature of work will receive a preparatory phase QC inspection prior to the start of work. This inspection is recorded on the attached Quality Control Surveillance Report. Work started on a new definable feature of work will receive an initial phase QC inspection. During the detector aided surface sweep the UXOQC, or Senior UXO technician if there is no UXOQC, will recheck 25% of the first four units of work (grids or transects). If quality requirements are not met on any unit, that unit will be rejected

and the UXO team will rework the entire unit. Once quality requirements are met for four units in a row, the UXOQC, or Senior UXO technician if there is no UXOQC may reduce the level of rechecks to 10% of each unit (grids or transects). If at any time a unit fails the quality control check, that complete unit will be reworked and the rechecks will be increased to 25% until four units in a row pass the recheck. These follow up phase QC inspections will be recorded on the attached Quality Control Surveillance Report. All work will be conducted in accordance with the MEC SAP and the SOPs attached to that MEC SAP. All requested changes to the approved MEC SAP will be documented on the attached Record-of-Change Form and submitted to the PM and UXO Manager for action/approval. The UXOQC will prepare the attached Daily Quality Control Report for each day worked summarizing the definable features of work inspected, the phase of that work, the locations, and personnel at the work site.

Detector-Aided Surface Sweep for Geophysical Survey

The UXO Technician will conduct a detector-aided surface sweep of the grid or area to be surveyed and record the location of any MEC items discovered. Each item will be marked and recorded as described above. UXO avoidance will be practiced during the geophysical survey.

Explosive Safety Submission (ESS)

When allowed by the conditions of the ESS determination, any non-munitions debris may be moved to facilitate a more effective surface sweep and/or geophysical survey. Non-munitions debris may be collected and stockpiled in a designated area within the boundaries of the site. The facility must agree to take possession of this non-munitions debris and arrange the proper disposition of the material before any items may be moved or disturbed.

Senior UXO Technician On Site

The SUXOS or Senior UXO Technician on site will complete the attached MEC Field Activity Daily Log for each day work is conducted. The log will be used to document and report significant events, logbook entries, phone calls, visitors, and other items of interest to the PM and UXO Manager. This report will be submitted as soon as possible at the end of the work day. The attached Field Activity Weekly Log is a summary of the week's events.

TABLE 1

White's Spectrum XLT Settings		
Basic Adjustments:	**UXO 1**	
Target Volume	58	
Audio threshold	23	
Tone (audio frequency)	226	
Audio Disc.	on	
Silent Search	off	
Mixed-Mode	on	
A.C. Sensitivity	60	Adjust at a test Grid. Compare with another White's
D.C. Sensitivity	30	Adjust at a test Grid. Compare with another White's
Backlight	0	
Viewing Angle	25	
Pro Options:		
"Audio"		
Ratchet Pinpointing	on	
S.A.T. Speed	7	
Tone I.D.	on	
V.C.O.	on	
Absolute Value	off	
Modulation	on	
"G.E.B/Trac"		
Autotrac	on	
Trac View	off	
Autotrac Speed	14	
Autotrac Offset	+1	
Trac Inhibit	on	
Coarse B.E.B.	54	These numbers are variable and will change automatically.
Fine G.E.B.	160	These numbers are variable and will change automatically.
"Discrimination"		
Disc. Edit	+95 Accept	
Block Edit	+95 Accept	
Learn Accept	off	
Learn Reject	off	
Recovery Speed	20	
Bottlecap Reject	20	

White's Spectrum XLT Settings		
Basic Adjustments:	**UXO 1**	
"Display"		
Visual Disc.	off	
Icons	on or off	
V.D.I. Sensitivity	55	
D.C. Phase	9on	
Graph Averaging	on	
Graph Accumulating	on	
Fade Rate	u	
"Signal"		
Transmit Boost	off	
Transmit Frequency	1 to 7	
Preamp Gain	4	

TETRA TECH NUS, INC.

Project:			
Tailgate Safety Briefing			
Date: _____		**Location: _____**	
Time: _____		**Team #: _____**	
1. Reason for Briefing:			
	Daily Safety Briefing		**New Site Procedure**
	Initial Safety Briefing		**New Site Information**
	New Task Briefing		**Review of Site Information**
	Periodic Safety Meeting		**Other: (Specify)**

2. Personnel Attending

Name	Signature	Position

Briefing Given By:

Name	Signature	Position

TETRA TECH NUS, INC.

3. Topics: (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illness
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

TETRA TECH NUS, INC.

Name	Signature	Position

TETRA TECH NUS, INC.

EQUIPMENT MAINTENANCE/REPAIR

MAINTENANCE/REPAIR NO._____
NECESSARY ATTACHMENTS _____ PACKING SLIP, and/or _____ MRR, abd _____LOGS

TYPE OF EQUIPMENT	SERIAL NO.
MAKE:	MODEL:
P O NUMBER	DELIVERY ORDER NO.
STANDARD MAINTENANCE	DATE
DESCRIPTION OF PROBLEM (if any) _____ _____ _____	
MAINTENANCE/REPAIRS TO BE PERFORMED	
IN-HOUSE REPAIRS	DATE
SENT OUT TO	COST ESTIMATE AIRBILL NO. P O NO. DATE RET'D
CORRECTIVE ACTION _____ _____ _____ _____	

PARTS LIST		
PART DESCRIPTION	QUANTITY	COST/EA
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

TOTAL LABOR (hours) PERFORMED BY	DATE
RETURNED TO WHICH JOB SITE/Stone Mountain, GA	

020803/P (MEC App A)

TETRA TECH NUS, INC.

EQUIPMENT UTILIZATION LOG

EQUIPMENT I.D._____

DESCRIPTION_____

DATE OUT	TIME OUT	COND. CODE & COMMENTS OUT	CHECKED OUT BY	DATE IN	TIME IN	CHECKED IN BY	COND. CODE & COMMENTS IN

CTO 423

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT		Report Number:	
Project Name:		Contract No:	
Client:		Project Manager:	
1 - Activity			
☐ Project Readiness UFP-SAP Review	☐ Pre-Operational Team Training Review	☐ Mobilization/Site Preparation	☐ Brush Cutting and Vegetation Clearance
☐ Pre-Survey ITS Review	☐ Daily Function Test	☐ UXO Detector-Aided Surface Sweeps/Quality Control Check	☐ UXO Detector-Aided Surface Sweep Field Data Collection &Transcription
☐ Geophysical Survey	☐ Geophysical Survey Field Data Collection and Transcription	☐ GPS Data	☐ Demobilization
☐ Other:	☐ Other:	☐ Other:	☐ Other:
2 - Phase			
☐ Preparatory	☐ Initial	☐ Follow up	
3 - References(1)			
4 – Observed Condition/Activities and Comments(1)			
5 – Results of Surveillance			
☐ Acceptable	☐ Unacceptable	Deficiency #: NCR #:	
Conducted By:	Signature:	Date:	
6 – Project Manager Review			
☐ Concur ☐ Non-Concur	Signature:	Date:	
7 - Distribution			
☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:			

(1) Add/reference continuation sheets as necessary.

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number:	Project:	
Report Number:	Location:	Date:

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory		
Initial		Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

_____ Project Quality Control Officer

_____ Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ Client QA Representative

_____ Date

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	
NO.	
SHEET OF	

PROJECT NAME:	PROJECT NO:
FIELD ACTIVITY SUBJECT:	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
PERSONNEL ON SITE:	
SIGNATURE:	DATE:

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	
NO.	
SHEET OF	

PROJECT NAME:	PROJECT NO:
FIELD ACTIVITY SUBJECT:	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):	

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	
NO.	
SHEET OF	

PROJECT NAME:	PROJECT NO:
FIELD ACTIVITY SUBJECT:	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
PERSONNEL ON SITE:	
SIGNATURE:	DATE:

RECORD-OF-CHANGE FORM

PROJECT NAME:	**PROJECT NO.**	
TO:	**LOCATION:**	**DATE:**
RE: Worksheet #/SOP # _____ Title: _____ Specific Sections: _____		
1. DESCRIPTION (items involved(1):		
2. REASON FOR CHANGE(1):		
3. RECOMMENDED ACTION(1) _____ Minor Change _____ Major Change (Impacts Cost, Schedule)		
4. DISPOSITION: (Approval Required by Client Representative) _____ Not Approved (give reason). _____ Considered minor change – APPROVED per recommended disposition – Documents will not be formally revised. Field office to maintain as –built records. _____ Considered major change – Client approval required via contract modification process		
Prepared by (Signature)		**Date:**
TtNUS Project Manager (Signature)		**Date:**
Point of Contact / Client Representative (Signature)		**Date:**

(1) Attach continuation sheets, sketches, etc., as applicable.

STANDARD OPERATING PROCEDURE
SOP OPS2

GEOPHYSICAL SURVEY

1.0 SCOPE AND APPLICABILITY

This operating procedure is designed to provide a regular set of guidelines for conducting geophysical surveys for the Munitions Response (MR) Program. The general procedure is intended to apply to a wide variety of investigations.

2.0 SUMMARY OF METHOD

Various military operations (transport, training, practice and experimental) over time have resulted in the deposition of a wide assortment of munitions and explosives of concern (MEC), and a large effort is underway to search and remove such items from many of the active and inactive military sites across the country. MEC range from small objects (20 mm) to large objects (bombs), and their potential abundance on a site can vary considerably as well. Geophysics is a non-intrusive approach often used to locate buried objects that could be MECs. Numerous steps are involved in selecting a geophysical approach, and they are described below.

All unexploded ordnance (UXO) survey and avoidance activities and geophysical surveys will be carried out in accordance with all local, state, and federal regulations, and will include general guidance from applicable United States Army Corps of Engineers (USACE) requirements, including Engineer Pamphlet EP-75-1-2 dated 01 August 2004 (USACE, 2004b), Data Item Descriptions; MR-001 (USACE, 2003a), MR-005-05A (USACE, 2003c), MR-005-05 (USACE, 2003d), and MR-005-07 (USACE, 2003e). Additional guidance is provided in Ordnance and Explosives Digital Geophysical Mapping Guidance – Operational Procedures and Quality Control Manual (DGM QC Guidance) (USACE, 2003f).

3.0 PERSONNEL QUALIFICATIONS

Personnel responsible for designing or conducting geophysical processes should possess education and training in geophysics to insure proper procedures are followed. Sub-contractors should possess similar personnel requirements when implementing a geophysical plan. Personnel will meet the requirements of USACE Data Item Description OE – 025.02 (USACE, 2004a) described below.

Project Geophysicist - This individual will have a degree in geophysics, geology, geological engineering, or a closely related field, and will have a minimum of 5 years of directly related geophysical experience. This individual has overall responsibility for design, implementation, and management of all geophysical investigations required for the work effort, but may not necessarily be on-site full time. This individual will be the project geophysicist-of-record.

Site Geophysicist - This individual will have the same education requirements as the Project Geophysicist, except the 5 years minimum experience requirement is waived, if working under the general supervision of a Project Geophysicist. This individual is responsible for day-to-day operations of the site geophysical investigations. This individual may also be the Project Geophysicist if he/she meets the identified qualifications.

4.0 SURVEY DESIGN

Several considerations must be taken into account when designing a geophysical survey:

Site Preparation: Sites suspected to contain MEC must be inspected by a properly qualified UXO technician. The inspection will include, as a minimum, a visual inspection which may be assisted by a hand-held magnetic or all-metals locator. This is to ensure safety for setting monuments or survey stakes, and in collecting the survey data. All movable aboveground non-munitions metal debris should be removed from the site prior to commencement of the geophysical survey in order to obtain more complete subsurface information (not be interfered with by the aboveground metal that could mask subsurface metal).

Vegetation can also create limitations for survey coverage. Brush cutting and vegetation clearing may be necessary to acquire geophysical data.

Equipment Selection: An understanding of the nature of the suspect MEC must be established first in order to select the proper equipment for the survey site.

Magnetometer surveys are selected when the potential MEC targets are comprised of a substantial ferrous (iron) component, and the site is expected to have low levels of cultural ‘noise’ (ex. power lines, scrap mixed in with the soil, numerous aboveground metallic objects that cannot be removed from the survey area). Maximum prospecting depth is limited by the strength of the magnetic field for the potential MEC (controlled by the mass, diameter and orientation of the buried metallic object). Sensor height will

be determined by the Geophysicist based on the nature of site conditions and expected target sizes and depths.

Electromagnetic (EM) induction surveys are selected when the potential MEC targets are comprised of a significant component of any type of metal. Normally maximum prospecting depths are limited to about 12 to 18 feet below ground surface for the largest potential targets, but will range to very shallow depths for small metallic objects.

Certain geologic conditions may be prohibitive to the success of a geophysical survey, and in such cases a pilot test or Geophysical Prove Out (GPO) may be required to determine whether the survey equipment can detect the buried targets. Examples of such conditions include ultra-mafic soils or shallow bedrock, high electrically conductive soils (perhaps fill containing scrap metal) or salt water conditions which can interfere with the detection capabilities of the survey equipment. No such prohibitive conditions are expected to affect the geophysical approaches on this project, and a GPO is not considered to be necessary for this project. An Instrument Test Strip (ITS) will be used instead, to test the equipment and operator(s) in detecting a small variety of buried munitions or surrogates to verify that the method is functioning properly.

Survey Coverage: Expected target sizes, anticipated burial depths and the target metal mass must be evaluated by the Geophysicist in order for proper selection of survey line spacing given the selection of geophysical equipment in order to possess a high level of confidence that the project goals can be accomplished. Surveys conducted using 2.5 foot line spacing with an EM61 or G-858 magnetometer will provide 100% effective survey coverage for most MEC targets. Conversely, in cases where a reconnaissance survey is needed, meandering path or non-traditional survey geometries may be substituted to accomplish the project goals. In all cases, consideration must be given to past, current and future land uses to assure that the survey approach meets the client objectives.

Survey Location: Locating survey lines (data) can be accomplished in a few ways. The level of accuracy needed and the surrounding site features will help determine the acceptable location technique. Small survey areas may be located with a high level of accuracy using tape measures to create survey lines (grids). The grids may then be referenced directly to permanent and semi-permanent site features.

Larger survey areas or survey areas in remote areas may need a different location method to maintain a high level of accuracy. Professional surveying or integrating differential global positioning system (DGPS) measurements with the geophysical data can be used in large areas to maintain high location accuracy. Numerous global positioning systems (GPS) units are readily available to achieve sub-meter accuracy.

Specialized GPS units (Real Time Kinematic or RTK) should be employed when sub-foot accuracies are needed. GPS units do not normally operate effectively in wooded areas, and professional surveying or total stationing methods may be required for high level accuracy in those areas. Alternatively, wooded survey areas may be established by tape measure, followed by GPS (where a clear GPS signal can be received), total stationing or professional surveying of several survey grid points or corners.

Data Sampling: Data must be collected at intervals to satisfactorily sample the anticipated targets. Expected target sizes, anticipated burial depths and the target metal mass must be evaluated by the Geophysicist in order for proper selection of data sampling intervals. Data station intervals will normally be determined from the movement speed along the survey lines with respect to the data initiation interval (normally automatic or sometimes manual as a function of time). Measurements may be triggered by a survey wheel attached to the survey instrument when sufficient data density can be achieved. Calibration of the survey wheel may be needed depending on the instrument setup.

5.0 EQUIPMENT

Instrument Checks:

Equipment Standardization. Geophysical sensors and support equipment, navigation equipment, and operator performance will be checked and tested at specific intervals and must meet the appropriate acceptance criteria. Table 1 lists the tests and their required frequencies and acceptance criteria modified from USACE Engineering Pamphlet 75-1-2 (2004). These tests plus the initial out-of-box tests are detailed below.

Out-of-Box-Tests. The following out-of-box procedures will be conducted before the pre-seed geophysical survey of the test plot area begins:

- Inventory and inspect all equipment to confirm all components are present and in good condition.
- Assemble the equipment and power up.

Regular Tests.

1. **Equipment/Electronics Warm-Up.** This test minimizes sensor drift caused by thermal stabilization. Most instruments need a few minutes to warm up before data collection begins. All manufacturer instructions will be followed or, if none are given, data readings will be observed until they stabilize.

Acceptance Criterion: Equipment Specific (typically 5 minutes). This test will be conducted each time the unit is started.

2. **Equipment Null.** The EM61 equipment will be nulled before data collection at each site. The units will be nulled in areas determined to represent background levels (non-anomalous areas 'quiet areas').

3. **Record Sensor Positions.** The purpose is to document relative navigation and sensor offsets, detector separation, and detector heights above the ground surface. This information will ensure that the detector offset corrections and gradient calculations can be done correctly and that the surveys are repeatable. Acceptance Criterion: ±1 inch. This test will be conducted at the beginning of the 1st day and when an equipment configuration change is made.

4. **Personnel Test.** This test ensures that survey personnel have removed all potential interference (metal) sources from their bodies. Common interference sources are ballpoint pens, steel-toe boots, or large metallic belt buckles, which can produce data anomalies similar to OE targets. All personnel who will be coming near the sensor during survey operations will remove metallic items from themselves, and if not possible then readings will be monitored and recorded to judge the effect of the metallic items in order to meet the following acceptance criteria. Acceptance Criterion: EM 61 3 mV, magnetometer 3 nT. This test will be conducted at the beginning of each day if the operator is wearing metallic items that could interfere with equipment operation.

5. **Static Background and Static Spike (or Standard Response) Test.** These tests quantify instrument background readings and electronic drift, locate potential interference spikes in the time domain, and determine impulse response and repeatability of the instrument to a standard test item (typically a 2-inch-diameter steel trailer hitch ball). Improper instrument function, the essence of local sources of ambient noise (such as EM transmissions from high-voltage electric lines), and faulty equipment are all potential causes of inconsistent, non-repeatable readings. A minimum of 3 minutes static background test after instrument warm-up, followed by a 1-minute standard response test, in turn followed by an additional 1 minute static background test, will be performed. The field geophysicist must review the readings to confirm they are stable before the geophysical survey continues. Guidance Criteria: Static Background test EM 61 ± 3 mV, magnetometer ± 3 nT; Static Response Test ±20% of standard item response after background correction. This test will be conducted at the beginning of each day.

6. **Base-Line Test.** This test is conducted in an area that has low background noise and no sources of anomalous response. The test line will be well marked to facilitate data collection over exactly the

same line each time the test is performed. The test may need to be conducted at the beginning, middle and end of each day to check for instrument drift (baseline shift in data values) or in the situation where a magnetic base station is not used during a magnetometer survey in order to make any necessary data value adjustments.

7. **Pull-Away Test.** This test demonstrates the effects of the navigational equipment. All equipment will be powered up and operating as it would be during the survey. Acceptance Criterion: document the effects of the navigational equipment on the geophysical readings. Effects should be small. Test will be performed before the geophysical survey begins, and if the equipment configuration changes during the survey.

8. **GPS Positioning.** The GPS positioning system will be tested by surveying two survey control points. The GPS coordinates are compared with the documented coordinates for the control points. Acceptance Criterion: sub-meter or better (based on project requirements). Test should be performed as a minimum at the beginning of the project and if an equipment change is made. GPS survey instruments should also be closely monitored during field acquisition by using dilution of precision (DOP) criteria, or as a minimum # of satellite signals received criteria. DOP should normally be less than 3 to obtain high quality results, and at least 6 satellites should also indicate high quality results.

   a) Latency is an issue when a separate GPS controller (from the geophysical controller) is used to acquire the GPS data.

   b) If separate controllers are used, care will be taken to synchronize the clocks in both the GPS and geophysical units, and a test must be set up to measure the latency inherent in using two different accuracy clocks.

   c) The test will consist of positioning oneself overtop of a linear metallic object (ex. pipe) at several points and recording data with the survey equipment, and again using only the GPS equipment to compare the results and determine the necessary adjustment.

9. **Azimuth Test.** The purpose of this test is to optimize the sensor orientation to avoid optically pumped magnetometer sensor “dead zones”, and obtain a strong signal strength.

6.0 QUALITY ASSURANCE / QUALITY CONTROL

All documentation will be available to client personnel. Operational and test procedures will conform to the manufacturer's standard instructions. Quality control (QC) of the instruments' data will be achieved daily by field testing, checking the sensor and navigation system against a known target to ensure that they are operating properly. All geophysical instruments and equipment used to gather and generate field data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of the results are consistent with the manufacturer's specifications. Calibration, repair, or replacement records will be filed and maintained by the field geophysicist and may be subject to audit by the quality assurance (QA) manager. Potential data problems include source data errors, data entry errors, data editing errors, and user errors. All data will be reviewed to identify and correct any of these errors should they occur.

7.0 FIELD REPORTING AND RECORDS MANAGEMENT

Field data sheets/notes will be maintained for all geophysical activities. At the end of this SOP is a copy of the field forms for the project including:

- Equipment Maintenance Form (to document equipment repair or replacement).
- QC Surveillance Report Form (to document fieldwork QC assessments).
- Daily QC Report (to document daily QC performed).
- Daily Checklists (ITS Location Design, Out of Box).
- Initial Instrument Tests.
- Daily Instrument Checks.
- EM61 Operating Procedures and Field Editing.

Project documentation will be collected and managed on-site during the life of all field activities. Geophysical data will be recorded digitally and downloaded to a field computer for review in the field. In addition to the copy of data saved on the field computers hard drive, a copy of the data will be saved on a compact disk (CD) for backup before the data are erased from the equipment. The project geophysicist will review the downloaded data to verify that the download system is functioning properly. This review will also check the field data for QC review. The review will verify that the data are valid and useable for the intended purpose.

8.0 INSTRUMENT TEST STRIP

An Instrument Test Strip (ITS) will be performed to evaluate geophysical surveying techniques that apply to the MEC sites and personnel that will be conducting the surveys. ITSs are important in testing the survey technique to determine whether it is capable of detecting the target items.

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Instrument Test Strip

The specific objectives for the ITS will be:

- Verify that the proposed geophysical method is functioning properly.

- Provide a safe area with a known set of isolated objects (for example, inert UXO or UXO surrogates). The sensor signatures from these items will be used to evaluate the equipment response in the site geologic setting and to optimize equipment, procedures, and data analysis.

- Assess the operators' performance and update related procedures to assist in the development of operator measurement techniques.

- Evaluate average speed, minimum along-track sampling, and line separation distance in detecting target items.

- Evaluate all data processing, including distance corrections, map production, and target selection, to produce final datasets.

- Evaluate detection depth capabilities.

- Identify horizontal positions of detected seed items to be within project specified limits.

Test Strip Design.

a. Test Strip Size and Location. The test strip location should be in an area where cultural interferences are at a minimum, and separation of seed items should be sufficiently large to enable the anomalies from the seed items to be fully defined. This separation is project (seed size) dependent, and should be determined by the Project Geophysicist. Selection of the test-strip area will be based upon the technical and site-specific considerations developed and finalized during the project planning process

and/or project team meetings. It may be advantageous to plan the test strip location outside of areas where digging is restricted to UXO technicians and/or oversight by UXO technicians. Once a location(s) is chosen, proper notifications and submissions must be made through the Base Remedial Project Manager (RPM) to obtain all necessary dig permits and utility clearances.

b. Seed Items. The planned seeding methodology for known items will be described. Once placed, all seeded items and end markers will be surveyed and photographed. The planned ITS target layout plan will be updated to reflect the "as built" configuration. The seeded items will be tagged with a non-biodegradable label identifying the items as inert and providing a contract reference, a point of contact address, phone number, and a target identifier.

   A tabulated list, available in digital format, containing the seed item descriptions, ID numbers, locations, orientation (or survey information on the nose, tail, and center point of the item) will be generated. Inert MEC items should be used whenever possible.

c. Site Preparation. Describe any preparation that may be necessary to allow accessibility with geophysical instruments. This may include vegetation removal and/or surface clearance. After this step, the test plot should duplicate, as closely as possible, the conditions under which the geophysical surveys will be conducted.

d. Positional Surveying. Describe the positional methods to be employed for locating the geophysical data. The location of the test plot corners and seed items will be surveyed to a horizontal accuracy established during the project planning process and/or project team meetings. In addition, surface elevation will be measured after seed item burial, to accurately determine depth below ground surface.

e. Pre-Seeding (Background) Geophysical Mapping. Describe background geophysical mapping. After a site has been selected and the surface prepared, pre-seeding geophysical surveys will be performed with each detector type in order to determine and document base-line geophysical conditions at the site.

f. Quality Control. Describe Quality Control measures to be implemented.

g. Anomaly Avoidance. Anomaly avoidance will be performed by all site workers for all anomalies located, visually or with metal detectors, during preparation of the test plot site. A statement that the contractor will use anomaly avoidance techniques will be included. This is to ensure the location of

each excavation and corner marker/stake is clear of metallic anomalies before placing seed items or site corner markers, and includes utilizing the background geophysical data.

h. Data Collection Variables. It is important to collect and analyze test plot data using the same equipment and procedures that are planned for field use. Key personnel from the ITS will perform the production survey to minimize the learning curve and provide project continuity. Some data collection elements are subject to modification, and evaluation and multiple geophysical surveys using each proposed geophysical instrument may be performed. These elements include: instrument height, instrument orientation and direction of travel, instrument channel selections, measurement interval along survey line, lane width, etc.

i. Data Analysis and Interpretation. All data collected across the test strip will be processed and analyzed. Comparison of selected target anomalies to seed item locations will be evaluated.

j. Reacquisition. The contractor will perform anomaly reacquisition and verification when necessary to meet project goals, and record these measurements. This should be done to the same extent and with the same equipment as planned for the production geophysical investigation.

After the ITS field work has been completed, the contractor will document the ITS in a brief letter report including the following:

a. As-built drawing of the ITS plot;
b. Color maps or profiles of the geophysical data;
c. Summary of the ITS results;
d. Geophysical equipment, techniques, and methodologies; and
e. Sufficient supporting information to justify the project team's recommendations.

The Contractor may not proceed with production geophysical mapping until the Tetra Tech Project Manager or their designee approves the ITS results.

Table 1: Geophysical Equipment QC Tests
Munitions and Explosives of Concern Sites
Military Munitions Response Program

Test No.	Test Description	Acceptance Criteria	Power On	Beginning of Day	Beginning, Middle and End of Day	1st Day on Site
1	Equipment Warm-up	Equipment specific (typically 5 minutes)	X			
2	Equipment Null	Conduct in non-anomalous areas				X
3	Record Sensor Positions	± 1 inch (2.54 cm)				X
4	Personnel Test	EM61 2 mV (channel 3 on MkII), magnetometer 2 nT		X		
5	Static Background and Static Spike	Guidance Criteria: Background: EM61 ± 3 mV, magnetometer ± 3 nT. Spike: ± 20% of standard item response, after background correction		X		
6	Base-Line Test	Check for instrument drift /diurnal change (to correct data readings if needed)			X (EM31 or MAG)	
7	Pull Away Test	Navigation equipment should have minimal effect on readings				X
8	GPS Positioning	Positional accuracy: sub-meter / foot				X
9	Azimuth Test	Strong signal strength, no data dropouts				X
10	Equipment Function Test	Anomalous response from all targets within project specified acceptance limits		X		

Notes: cm – Centimeter, mV – Millivolt, nT – nanoTesla

TETRA TECH NUS, INC.

EQUIPMENT MAINTENANCE/REPAIR

MAINTENANCE/REPAIR NO._____
NECESSARY ATTACHMENTS _____ PACKING SLIP, and/or _____ MRR, abd _____LOGS

TYPE OF EQUIPMENT	SERIAL NO.
MAKE:	MODEL:
P O NUMBER	DELIVERY ORDER NO.

STANDARD MAINTENANCE	DATE

DESCRIPTION OF PROBLEM (if any)

_____
_____
_____

MAINTENANCE/REPAIRS TO BE PERFORMED

IN-HOUSE REPAIRS	DATE
SENT OUT TO	COST ESTIMATE AIRBILL NO. P O NO. DATE RET'D

CORRECTIVE ACTION

_____
_____
_____
_____

PARTS LIST

PART DESCRIPTION	QUANTITY	COST/EA
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

TOTAL LABOR (hours) PERFORMED BY	DATE

RETURNED TO WHICH JOB SITE/Stone Mountain, GA

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT		Report Number:	
Project Name:		Contract No:	
Client:		Project Manager:	
1 - Activity			
☐ Project Readiness UFP-SAP Review	☐ Pre-Operational Team Training Review	☐ Mobilization/Site Preparation	☐ Brush Cutting and Vegetation Clearance
☐ Pre-Survey ITS Review	☐ Daily Function Test	☐ UXO Detector-Aided Surface Sweeps/Quality Control Check	☐ UXO Detector-Aided Surface Sweep Field Data Collection &Transcription
☐ Geophysical Survey	☐ Geophysical Survey Field Data Collection and Transcription	☐ GPS Data	☐ Demobilization
☐ Other:	☐ Other:	☐ Other:	☐ Other:
2 - Phase			
☐ Preparatory	☐ Initial	☐ Follow up	
3 - References(1)			
4 – Observed Condition/Activities and Comments(1)			
5 – Results of Surveillance			
☐ Acceptable	☐ Unacceptable	Deficiency #: NCR #:	
Conducted By:	Signature:	Date:	
6 – Project Manager Review			
☐ Concur ☐ Non-Concur	Signature:	Date:	
7 - Distribution			
☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:			

(1) Add/reference continuation sheets as necessary.

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT			
Contract Number:	Project:		
Report Number:	Location:	Date:	
Phase	List Definable Features of Work, Locations, and List Personnel Present		
Preparatory			
Initial		Inspection Performed	
Follow up		Inspection Performed	
Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today		
Remarks			
On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Project Quality Control Officer	Date	
Client Quality Assurance			
Quality Assurance Representative Remarks and/or Exceptions to the Report	Client QA Representative	Date	

Checklist for ITS Location Design

Project Name: _____

Project Location: _____

CEHNC POC: _____

Reviewer's Name and Title: _____

Date of Review: _____

Objectives	**Y**	**N**	**NA**
a. Have survey objectives been determined, clarified, and documented?	☐	☐	☐
b. Has EM-1110-1-4009 been consulted to ensure that all applicable objectives mentioned therein will be met?	☐	☐	☐
c. Will the ITS be available during the project for the evaluation of suspected instrument malfunctions?	☐	☐	☐
d. Will the ITS be available during the project for the evaluation of new equipment and operators?	☐	☐	☐
e. Is the contractor prepared to demonstrate target reacquisition techniques in the ITS area?	☐	☐	☐
Site Selection			
a. Has the proposed ITS site been evaluated for the following criteria:			
• Easy access for project personnel?	☐	☐	☐
• Restricted access for non-project personnel?	☐	☐	☐
b. Is the ITS located in close proximity to the survey area?	☐	☐	☐
c. Does the ITS have geophysical noise conditions similar to those expected in the survey area?	☐	☐	☐
d. Does the ITS have terrain and vegetation conditions similar to those of the survey area?	☐	☐	☐
e. Has a backup ITS site been identified?	☐	☐	☐
Site Preparation			
a. Has surface clearance been performed?	☐	☐	☐
b. Geophysical map entire area prior to burial?	☐	☐	☐

Checklist for ITS Location Design

Seeding ITS Grid	**Y**	**N**	**NA**
a. Have all available sources been consulted to determine appropriate seed items and orientations?	☐	☐	☐
b. Have DQOs been established and documented?	☐	☐	☐
c. Have appropriate burial depths been determined for the seed items?	☐	☐	☐
d. Is the contractor prepared to demonstrate target reacquisition techniques in the ITS area?	☐	☐	☐
e. Has a list been made to document the range of burial depths for different MEC items?	☐	☐	☐
f. Have the following steps been taken to ensure accurate locations for the seeded items:			
• Specify location requirements in x,y,z?	☐	☐	☐
• Measure depth to top and center of mass of each object?	☐	☐	☐
• Thorough notes taken on each item's burial?	☐	☐	☐
• GPS or a land surveyor employed to record the position of each item?	☐	☐	☐

Checklist for Out of Box Equipment Tests

Project Name: _____

Project Location: _____

CEHNC POC: _____

Equipment Source: _____

Equipment Serial Numbers: _____

Reviewer's Name and Title: _____

Date of Review: _____

	Y	N	NA
a. Has the equipment been inventoried and inspected for damage or wear?	☐	☐	☐
b. Are spare parts (cables) included with system?	☐	☐	☐
c. Has the cable shake test been performed? (Replace any faulty components if necessary)	☐	☐	☐

Checklist for Initial Instrument Tests

Project Name: _____

Project Location: _____

CEHNC POC: _____

Equipment Source: _____

Equipment Serial Numbers: _____

Reviewer's Name and Title: _____

Date of Review: _____

	Y	N	NA
a. Has the sensor travel test been performed and are the results acceptable to meet survey objectives?	☐	☐	☐
b. Has the GPS unit been checked for accuracy requirements against two known locations?	☐	☐	☐
c. Has the optimum sensor height for each instrument been determined?	☐	☐	☐
d. Have the pull-away and interferences tests been performed and successfully demonstrated no influence for navigational or towing equipment?	☐	☐	☐

Checklist for Daily Instrument Checks

Project Name: _____

Project Location: _____

CEHNC POC: _____

Equipment Source: _____

Equipment Serial Numbers: _____

Reviewer's Name and Title: _____

Date of Review: _____

	Y	N	NA
a. Has the operator been checked for presence of metal?	☐	☐	☐
b. Has the instrument been warmed-up?	☐	☐	☐
c. Has the sensor position been measured and recorded?	☐	☐	☐
d. Has instrument (EM only) been nulled?	☐	☐	☐
e. Has a static background test been performed and demonstrated <20% deviation in response over at least 3 minutes: • Start of day?	☐	☐	☐
f. Has the operator been thoroughly examined with the geophysical instrument for any sources of response that may not be readily apparent?	☐	☐	☐
g. Has the Equipment Function Test been performed with detection of all of the test targets within specified limits?	☐	☐	☐
h. Has the GPS positioning been compared to two known locations to ensure project accuracy limits are being met?	☐	☐	☐

Checklist for EM-61 Operating Procedures

Project Name: _____
Project Location: _____
CEHNC POC: _____
Reviewer's Name and Title: _____
Date of Review: _____

	Y	N	NA
a. Has a careful inspection been made to ensure that all metal has been removed from the operator?	☐	☐	☐
b. Has the instrument been warmed-up for 5 minutes?	☐	☐	☐
• Was a static test performed during warm-up to document ambient noise at the site?	☐	☐	☐
c. Were battery levels checked and recorded?	☐	☐	☐
d. Has an appropriate data acquisition rate been selected?	☐	☐	☐
e. Have the EM61 wheels been evaluated for the presence of metal and replaced, if necessary?	☐	☐	☐
f. Have all loose cables been secured?	☐	☐	☐
g. Has the established nulling station been occupied:			
• Power On	☐	☐	☐
h. Were the data monitored during data collection for anything unusual or unexpected?	☐	☐	☐

STANDARD OPERATING PROCEDURE
SOP-OPS3

GEOPHYSICAL DATA PROCESSING AND ANALYSIS

1.0 SCOPE AND APPLICABILITY

This operating procedure is designed to provide a regular set of criteria to be taken into account during data processing and analysis for geophysical surveys performed as part of Munitions Response Programs (MRPs). The general procedure is intended to apply to a wide variety of investigations (targets).

2.0 BACKGROUND

The way in which data processing and analysis is performed is dependent on the type of geophysical method employed. We focus here on the two most common general methods used on MRP sites: magnetics or magnetometry (MAG) and electromagnetic induction (EMI). Initially data are recorded electronically during fieldwork and subsequently downloaded to computer. From there, specific equipment-related (proprietary) software is used to process the data for navigation, correction factors, filtering and ultimately for exporting data files that can be read by a data contouring package. The government has partnered with Geosoft, Inc. in order to develop a data contouring package specifically optimized for MRP geophysical data (Oasis montaj w/UX Detect module). Contour maps or data profiles and dig sheets (anomaly locations) are normally produced as end products of the geophysical survey.

3.0 PERSONNEL QUALIFICATIONS

Personnel responsible for processing should possess education and training in geophysics to insure proper procedures are followed. Personnel will meet the requirements of USACE Data Item Description OE – 025.01 (USACE 2002) for a Project Geophysicist or for a Site Geophysicist that is directly under the supervision of the Project Geophysicist.

4.0 PROCESSING AND ANALYZING

Standard corrections will be applied to the data using equipment-specific (proprietary) software and by using Geosoft's Oasis montaj software, and the data processing checklist attached to this SOP should be

completed by the data processor. Instrument settings and survey line spacing should be taken into account during data processing to properly represent the data. Diurnal corrections, corrections to navigation (geometry) and rotation or translation of coordinate systems, removal of data spikes (judged to be artificial) and dropouts, corrections for fiducial marks, instrument drift and leveling, heading error corrections, and latency corrections may be items to address during processing. Filtering and enhancements may also be needed depending on the nature or quality of the data.

The data analysis performed by the Project Geophysicist or under his/her direct supervision will focus on identifying anomaly responses that could represent MEC. A detailed map and anomaly investigation report will be produced [ex. dig sheet, Data Item Description MR-005-05 (USACE, 2003c)] depicting the northing and easting of all anomalies that meet the identification criteria of potential ordnance items for the site, and actual data stations locations will also be provided. Each anomaly will be assigned a unique reference number for potential field reacquisition.

Checklist for Field Editing

Project Name: _____

Project Location: _____

CEHNC POC: _____

Reviewer's Name and Title: _____

Date of Review: _____

	Y	N	NA
a. Have the following items been evaluated for correctness and edited if necessary:			
• Line numbers?	☐	☐	☐
• Start and end points?	☐	☐	☐
• Line direction?	☐	☐	☐
• Fiducial locations?	☐	☐	☐
b. Have the data been examined in profile and evaluated for geophysical noise?	☐	☐	☐
c. Have the data been examined for the presence of drop-outs and spikes?	☐	☐	☐
d. Have the edited data been converted to the appropriate .xyz format?	☐	☐	☐
e. If using magnetics, have the following steps been taken:			
• Examined base station data for any problems?	☐	☐	☐
• Performed diurnal correction to field magnetometer data?	☐	☐	☐
f. Have the positional data been evaluated for accuracy and completeness?	☐	☐	☐

Checklist for Data Processing

		FILENAMES:	
Site:		Raw: Edited:	
Location:		Processed:	
Contractor:		Contour Map:	
Sector: Grid:		Target List:	
Processor(s):		Target Map:	

Preprocessing	**Y**	**N**	**NA**
a. Coordinate Conversion Projected Coordinate System _____	☐	☐	☐
• Removal of Drift	☐	☐	☐
• Latency and Offset	☐	☐	☐

Preprocessing			
a. Initial Gridding			
• Calculation of 3D Analytic Signal	☐	☐	☐
• Digital Filtering and Enhancement	☐	☐	☐
Filter 1: _____	☐	☐	☐
Filter 2: _____	☐	☐	☐
Filter 3: _____	☐	☐	☐
Filter 4: _____	☐	☐	☐
• Threshold Selection Threshold value: _____	☐	☐	☐
• Anomaly Selection Number of targets: _____	☐	☐	☐

STANDARD OPERATING PROCEDURE
SOP OPS4

MEC MANAGEMENT AND ACCOUNTABILITY

A. SCOPE AND APPLICABILITY

This document is designed to set a standard operating procedure (SOP) for the management and accountability of Munitions and Explosives of Concern (MEC) encountered during activities performed under the Munitions Response Program (MRP).

B. BACKGROUND

MEC activities will be performed in accordance with all local, State, and federal regulations and will include all applicable DoD requirements. Generally, MEC will be encountered during the performance of Unexploded Ordnance (UXO) detector-aided surface sweep operations, subsurface geophysics investigations and UXO Escort operations. UXO detector-aided surface sweep operations may be used as a stand-alone method for site survey and assessment or in preparation for geophysical survey and other operations. UXO escort operations may be required during site visits (initial site assessments, planning, and stakeholders meetings), geophysical operations, construction support during subsurface activities, and MC sampling operations.

C. PERSONNEL QUALIFICATIONS

UXO personnel shall be graduates of a military Explosive Ordnance Disposal (EOD) School of the United States, Canada, Great Britain, Germany, or Australia or a graduate of a formal training course of instruction or EOD assistant course as stated in DDESB TP-18.

D. MEC MANAGEMENT AND ACCOUNTABILITY OPERATIONS

UXO Detector-Aided Surface Sweep

If suspect MEC is encountered, its location will be recorded and/or marked using a GPS, tape measure, or other grid coordinate location system. The UXO Team will attempt to determine its condition without moving or disturbing the item prior to proceeding with the surface sweep. Each item will be marked with engineer flagging and given a unique ID number. ID numbers will start with a letter(s) corresponding to

the site or grid in which the item is located. This will be followed by the transect number of the site or grid specific to the location of the item. Lastly, a number will be assigned to the individual items within the transect. These numbers will start at 01 and run consecutively. For example:

*The site name is **O**pen **B**urn **P**it. The first transect within the Open Burn Pit is **A1**. The first item encountered in transect A1 is item **01**. The ID number assigned to the item is **OBP-A1-01.***

All available information about the item will be recorded in the logbook/MEC Tracking Log as presented in Attachment 1 to this SOP, including suspect MEC location, identification, and ID number. A digital photograph will be taken of each item. The UXO Team will not move or otherwise disturb the item in an attempt to collect information. After all available information is recorded; the UXO Team will resume the detector-aided surface sweep.

Every effort will be made to identify each suspect MEC item located. Under no circumstances will any suspect MEC be moved in an attempt to make a definitive identification. The MEC item will be visually examined for markings and other external features such as shape, size, and external fittings. Prior to any documentation being developed on an MEC item, all fusing will be definitively identified if it is possible to safely do so visually without disturbing the ordnance item. This identification will consist of fuse type by function and condition (armed or unarmed) and the physical state/condition of the fuse, i.e., burned, broken, parts exposed/sheared, etc.

Only UXO-qualified personnel will perform MEC identification procedures. As an exception, a UXO Technician I may assist in the performance of MEC identification procedures when under the supervision of a UXO Technician III or higher. All personnel engaged in field operations will be thoroughly trained and capable of recognizing the specific hazards of the procedures being performed. To ensure that these procedures are performed to standards, all field personnel will be under the direct supervision of a UXO Technician III or higher. All suspect MEC items will be recorded following the requirements of this SOP, the site-specific Work Plan/QAPP, the project site-specific HASP, applicable ordnance operations procedural safety guidelines, and industry-accepted safe work practices and procedures.

Detector-Aided Surface Sweep for Geophysical Survey

The UXO Technician will conduct a detector-aided surface sweep of the grid or transect to be surveyed and record the location of each MEC item discovered, if any. Each item will be marked and recorded as described above. UXO avoidance will be practiced during the geophysical survey.

Explosive Safety Submission (ESS)

When allowed by the conditions of the Explosive Safety Submission (ESS) determination, any non-munitions debris may be moved to facilitate a more effective surface sweep and/or geophysical survey. Non-munitions debris may be collected and stockpiled in a designated area within the boundaries of the site. The facility must agree to take possession of this non-munitions debris and arrange the proper disposition of the material before any items may be moved or disturbed.

UXO Escort Operations

One UXO Technician, qualified as a UXO Technician II or higher, will be required to support each field team engaged in operations in areas that might contain MEC. If any MEC is encountered, the item will be avoided during this phase of the project.

The UXO Technician will not attempt to identify the type or condition of the ordnance during escort operations. Any area with visible ordnance or MEC will be clearly marked, and the area will be avoided. The location of visible ordnance or MEC will be recorded and noted in the field logs. If more senior level personnel are present on site, MEC findings will be reported to the UXO Team Leader. No ordnance, munitions, explosives, or ordnance-related materials will be moved, removed, or disposed of during UXO Escort duties.

Quality Control

The UXOQC will review the definable features of work prior to the start of work each day. A new definable feature of work will receive a preparatory phase QC inspection prior to the start of work. This insepction is recorded on the attached Quality Control Surveillance Report. Work started on a new definable feature of work will receive an initial phase QC inspection. During MEC management and accountability the UXOQC, or Senior UXO Technician if there is no UXOQC, will recheck 25-percent of the first four units of work (grids or transects). If quality requirements are not met on any unit, that unit will be rejected and the UXO Team will rework the entire unit. The initial phase QC inspection will be documented on the attached Quality Control Surveillance Report. Once quality requirements are met for four units in a row, the UXOQC, or Senior UXO Technician if there is no UXOQC, may reduce the level of rechecks to 10-percent of each unit (grids or transects). If at any time a unit fails the quality control check, the complete unit will be reworked and the rechecks will be increased to 25-percent until four units in a row pass the recheck. These follow up phase QC inspections will be recorded on the attached Quality Control Surveillance Report. All work will be conducted in accordance with the MEC SAP and the SOPs attached to that MEC SAP. All requested changes to the approved MEC SAP will be documented

on the attached Record-of-Change Form and submitted to the PM and UXO Manger for action/approval. The UXOQC will prepare the attached Daily Quality Control Report for each day worked summarizing the definable features or work inspected, the phase of work, the locations, and personnel at the work site.

E. NOTIFICATIONS IF MEC IS ENCOUNTERED

Any MEC item discovered during a detector-aided surface sweep, geophysical survey, or UXO escort operation will be left in place and will not be moved. Should MEC be encountered, the following scenarios should be addressed as follows:

(1) If a complete MEC item or ordnance related material is encountered that is believed to pose a hazard, is unexpectedly encountered at a given site, is encountered outside of the current established site boundaries, or is unknown, the UXO Team Leader, with support by UXO Technicians on site as necessary, will document the following information, as provided on Attachment 1, for notification purposes:

- Site Name
- Date/Time Encountered
- Name and UXO category of Person providing Notification
- Location of Item (provide coordinates)
- Type of Item (provide digital photograph)
- Apparent Fuze Condition (armed or unarmed)
- Physical Condition (burned, broken, parts exposed/sheared, etc)
- Physical Appearance (buried, staged, etc.)
- Activity in Progress

The UXO Team Leader will attempt to identify the type and/or condition of the ordnance and its location, as described above, and will immediately report this information to the client point of contact at the facility and the Tetra Tech UXO Manager. Prior to any documentation being performed on a suspect MEC item, all fuzing will be definitively identified only if it is possible to safely do so visually without disturbing the item. If directed by the point of contact at the facility, UXO personnel may take emergency non-invasive action such as securing the area until the appropriate exclusion and safety zones have been determined.

The Navy point of contact at the facility will be responsible for notifying appropriate EOD personnel or for designating this notification task to the Tetra Tech UXO Team Leader. The notification to EOD

personnel should be immediate if a live MEC item is encountered which could be a hazard to personnel, or if the item is unknown so that arrangements may be made through the facility for proper disposition of the item(s). If the facility initiates an emergency response or disposal action, follow-up documentation should be obtained to detail the date and method of disposition. This information is also needed to ascertain the actual type and condition of the item (live or inert filled) to aid in future classification of the site.

(2) If the MEC item cannot be identified by type as a conventional munition, and/or if in the unlikely event that the MEC is suspected to be potential Chemical Warfare Material (CWM), personnel will withdraw upwind from the area, assemble at a pre-designated rally point, secure the site, and immediately request assistance from the point of contact at the facility and notify the Tetra Tech UXO Manager. If so directed, UXO personnel will take emergency non-invasive actions such as covering the item with plastic sheeting and securing the area until the appropriate exclusion and safety zones have been determined.

(3) If Hazardous, Toxic, or Radiological Waste (HTRW) is encountered on-site, the work site will be evacuated until the Tetra Tech Project Health and Safety Officer, with concurrence of the client point of contact at the facility, identifies and implements appropriate protective measures.

For any of the scenarios, upon receiving notification from the Tetra Tech UXO Team Leader, the Tetra Tech UXO Manager will then immediately inform the Tetra Tech Project Manager, who will then immediately inform the client Project Manager. Tetra Tech Program Management personnel will then be notified. The client Project Manager will then make all other necessary notifications within the client's organization.

The following table lists contacts information.

Position	Name	Organization	Direct Dial Phone	Cell Phone
Project Manager	Ralph Basinski	Tetra Tech	412.921.8308	412.251.9736
UXO Manager	Ralph Brooks	Tetra Tech	770.413.0965 x231	404.661.4916
Indian Head POC	Jeffrey Bossart	NSF Indian Head	301.744.4705	
Navy Remedial Project Manager	Joe Rail	NAVFAC Washington	202.685.3105	

ATTACHMENT 1

MEC TRACKING LOG

NSF INDIAN HEAD – STUMP NECK ANNEX, MD

SITE:_____

ID #	ITEM IDENTIFICATION	UXO TECH NAME	ITEM COORDINATES	DATE/TIME FOUND	DIGITAL PHOTGRAPH NUMBER	ARMED / UNARMED	PHYSICAL CONDITION / APPEARANCE	DATE DESTROYED

TETRA TECH NUS, INC.

QUALITY CONTROL SURVEILLANCE REPORT		Report Number:	
Project Name:		Contract No:	
Client:		Project Manager:	
1 - Activity			
☐ Project Readiness UFP-SAP Review	☐ Pre-Operational Team Training Review	☐ Mobilization/Site Preparation	☐ Brush Cutting and Vegetation Clearance
☐ Pre-Survey ITS Review	☐ Daily Function Test	☐ UXO Detector-Aided Surface Sweeps/Quality Control Check	☐ UXO Detector-Aided Surface Sweep Field Data Collection &Transcription
☐ Geophysical Survey	☐ Geophysical Survey Field Data Collection and Transcription	☐ GPS Data	☐ Demobilization
☐ Other:	☐ Other:	☐ Other:	☐ Other:
2 - Phase			
☐ Preparatory	☐ Initial	☐ Follow up	
3 - References(1)			
4 – Observed Condition/Activities and Comments(1)			
5 – Results of Surveillance			
☐ Acceptable	☐ Unacceptable	Deficiency #: NCR #:	
Conducted By:	Signature:	Date:	
6 – Project Manager Review			
☐ Concur ☐ Non-Concur	Signature:	Date:	
7 - Distribution			
☐ PM ☐ FOL ☐ SUXOS ☐ UXO Manager ☐ Safety ☐ Other:			

(1) Add/reference continuation sheets as necessary.

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT			
Contract Number:	Project:		
Report Number:	Location:	Date:	
Phase	List Definable Features of Work, Locations, and List Personnel Present		
Preparatory			
Initial		Inspection Performed	
Follow up		Inspection Performed	
Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today		
Remarks			
On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Project Quality Control Officer	Date	
Client Quality Assurance			
Quality Assurance Representative Remarks and/or Exceptions to the Report	Client QA Representative	Date	

RECORD-OF-CHANGE FORM

PROJECT NAME:	**PROJECT NO.**	
TO:	**LOCATION:**	**DATE:**
RE: Worksheet #/SOP # _____ Title: _____ Specific Sections: _____		
1. DESCRIPTION (items involved(1):		
2. REASON FOR CHANGE(1):		
3. RECOMMENDED ACTION(1) _____ Minor Change _____ Major Change (Impacts Cost, Schedule)		
4. DISPOSITION: (Approval Required by Client Representative) _____ Not Approved (give reason). _____ Considered minor change – APPROVED per recommended disposition – Documents will not be formally revised. Field office to maintain as –built records. _____ Considered major change – Client approval required via contract modification process		
Prepared by (Signature)		**Date:**
TtNUS Project Manager (Signature)		**Date:**
Point of Contact / Client Representative (Signature)		**Date:**

(1) Attach continuation sheets, sketches, etc., as applicable.

STANDARD OPERATING PROCEDURE
SOP OPS5

GLOBAL POSITIONING SYSTEM

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the Field Technicians with basic instructions for operating a handheld Global Positioning System (GPS) unit allowing them to set GPS parameters in the receiver, record GPS positions on the field device, and update existing Geographic Information System (GIS) data. This SOP is specific to GIS quality data collection for Trimble-specific hardware and software.

If possible, the Trimble GeoXM or GeoXH Operators Manual should be downloaded onto the operator's personal computer for reference before or while in the field. The manual can be downloaded at http://trl.trimble.com/docushare/dsweb/Get/Document-311749/TerraSyncReferenceManual.pdf

Unless the operator is proficient in the setup and operation of the GPS unit, the Project Manager (or designee) should have the GPS unit shipped to the project-specific contact listed below in the Pittsburgh, Pennsylvania office at least five working days prior to field mobilization so project-specific shape files, data points, background images, and correct coordinate systems can be uploaded into the unit.

Tetra Tech NUS, Inc.
Attn: Ralph Basinski
661 Anderson Drive, Bldg #7
Pittsburgh, PA 15220

2.0 REQUIRED EQUIPMENT

The following hardware and software should be utilized for locating and establishing GPS points in the field:

2.1 Required GPS Hardware

- Hand-held GPS Unit capable of sub-meter accuracy (i.e. Trimble GeoXM or Trimble GeoXH). This includes the docking cradle, a/c adapter, stylus, and USB cable for data transfer.

Optional Accessories:

- External antenna
- Range pole
- Hardware clamp (for mounting Geo to range pole)
- GeoBeacon

- Indelible marker
- Non-metallic pin flags for temporary marking of positions

2.2 Required GPS Software

The following software is required to transfer data from the handheld GPS unit to a personal computer:

- Trimble TerraSync version 2.6 or later (pre-loaded onto GPS unit from vendor)

- Microsoft ActiveSync version 4.2 or later. Download to personal computer from: http://www.microsoft.com/windowsmobile/en-us/downloads/eulas/eula_activesync45_1033.mspx?ProductID=76

- Trimble Data Transfer Utility (freeware version 2.1 or later). Download to personal computer from: http://www.trimble.com/datatransfer.shtml

3.0 START-UP PROCEDURES

Prior to utilizing the GPS in the field, ensure the unit is fully charged. The unit may come charged from the vendor, but an overnight charge is recommended prior to fieldwork.

The Geo-series GPS units require a docking cradle for both charging and data transfer. The Geo-series GPS unit is docked in the cradle by first inserting the far domed end in the top of the cradled, then gently seating the contact end into the latch. The power charger is then connected to the cradle at the back end using the twist-lock connector. Attach a USB cable as needed between the cradle (B end) and the laptop/PC (A end).

It is recommended that the user also be familiar and check various Windows Mobile settings. One critical setting is the Power Options. The backlight should be set as needed to conserve power when not in use.

Start Up:

1) Power on the GPS unit by pushing the small green button located on the lower right front of the unit.

2) Utilizing the stylus that came with the GPS unit, launch **TerraSync** from the Windows Operating System by tapping on the start icon located in the upper left hand corner of the screen and then tap on **TerraSync** from the drop-down list.

3) If the unit does not default to the Setup screen, tap the Main Menu (uppermost left tab, just below the Windows icon) and select Setup.

4) If the unit was previously shipped to the Pittsburgh office for setup, you can skip directly to Section 4.0. However, to confirm or change settings, continue on to Section 3.1.

3.1 Confirm Setup Settings

Use the Setup section to confirm the TerraSync software settings. To open the Setup section, tap the Main Menu and select Setup.

1) Coordinate System
   a. Tap on the Coordinate System.
   b. Verify the project specs are correct for your specific project by scrolling through the various settings. Edit as needed and then tap OK; otherwise, tap Cancel to return to Setup Menu. **Note:** It is always best to utilize the Cancel tab rather than the OK tab if no changes are made since configurations are easily changed by mistake.
   c. Tap on the Units.
   d. Verify the user preferences are correct for your specific project by scrolling through the various settings. Edit as needed and then tap OK; otherwise, tap Cancel to return to Setup Menu.
   e. Tap Real-time Settings.
   f. Verify the Real-time Settings are correct for your specific project by scrolling through the various settings. Edit as needed and then tap OK; otherwise, tap Cancel to return to Setup Menu.
   g. The GPS unit is now configured correctly for your specific project.

4.0 ANTENNA CONNECTION

1) If a connection has been properly made with the internal antenna, a satellite icon along with the number of usable satellites will appear at the top of the screen next to the battery icon. If no connection is made (e.g.: no satellite icon), tap on the GPS tab to connect antenna.
2) At this point the GPS unit is ready to begin collecting data.

5.0 COLLECTING NEW DATA IN THE FIELD

1) From the Main Menu select Data.
2) From the Sub Menu (located below the Data tab) select New which will bring up the New Data File menu.
3) An auto-generated filename appears and should be edited for your specific project. If the integral keyboard does not appear, tap the small keyboard icon at the bottom of the screen.
4) After entering the file name, tap Create to create the new file.
5) Confirm antenna height if screen appears. Antenna height is the height that the GPS unit will be held from the ground surface (Typically 3 to 4 feet).
6) The Choose Feature screen appears.

5.1 Collecting Features

1) If not already open, the Collect Feature screen can be opened by tapping the Main Menu and selecting Data. The Sub Menu should default to Collect.
2) **Do not begin the data logging process until you are at the specific location for which you intend to log the data.**
3) A known reference or two should be shot at the beginning and at the end of each day in which the GPS unit is being used. This allows for greater accuracy during post-processing of the data.
4) Upon arriving at the specific location, tap on Point_generic as the Feature Name.
5) Tap Create to begin data logging.
6) In the Comment Box enter sample ID or location-specific information.
7) Data logging can be confirmed by viewing the writing pencil icon in the upper part of the screen. Also, the logging counter will begin. As a Rule of Thumb, accumulate a minimum of 20 readings on the counter, per point, as indicated by the logging counter before saving the GPS data.
8) Once the counter has reached a minimum number of counts (i.e. 20), tap on OK to save the data point to the GPS unit. Confirm the feature. All data points are automatically saved within the GPS unit.

9) Repeat steps 2 through 8, giving each data point a unique name or number.

Note: If the small satellite icon or the pencil icon is blinking, this is an indication the GPS unit is not collecting data. A possible problem may be too few satellites. While still in data collection mode, tap on Main Menu in upper left hand corner of the screen and select Status. Skyplot will display as the default showing the number of available satellites. To increase productivity (number of usable satellites) use the stylus to move the pointer on the productivity and precision line to the left. This will decrease precision, but increase productivity. The precision and productivity of the GPS unit can be adjusted as the number of usable satellites changes throughout the day. To determine if GPS is correctly recording data, see Section 5.2.

5.2 Viewing Data or Entering Additional Data Points to the Current File

1) To view the stored data points in the current file, tap on the Main Menu and select Map. Stored data points for that particular file will appear. Use the +/- and <-/-> icons in lower left hand corner of screen to zoom in/out and to manipulate current view.
2) To return to data collection, tap on the Main Menu and select Data. You are now ready to continue to collect additional data points.

5.3 Viewing Data or Entering Data Points from an Existing File

1) To view data points from a previous file, tap on Main Menu and select Data, then select File Manager from the Sub Menu.
4) Highlight the file you want to view and select Map from the Main Menu.
5) To add data points to this file, tap on Main Menu and select Data. Continue to collect additional data points.

6.0 NAVIGATION

This section provides instructions on navigating to saved data points in an existing file within the GPS unit.

1) From the Main Menu select Map.
2) Using the Select tool, pick the point on the map to where you want to navigate.
3) The location you select will have a box placed around the point.
4) From the Options menu, choose the Set Nav Target (aka set navigation target).
5) The location will now have double blue flags indicating this point is you navigation target.

6) From the Main Menu select Navigation.
7) The dial and data on this page will indicate what distance and direction you need to travel to reach the desired target.
8) Follow the navigation guide until you reach the point you select.
9) Repeat as needed for any map point by going back to Step 1.

7.0 PULLING IN A BACKGROUND FILE

This section provides instructions on pulling in a pre-loaded background file. These files are helpful in visualizing your current location.

1) From the Main Menu select Map, then tap on Layers, select the background file from drop down list.
2) Select the project-specific background file from the list of available files.
3) Once the selected background file appears, the operator can manipulate the screen utilizing the +/- and <-/-> functions at the bottom of the screen.
4) In operating mode, the operator's location will show up on the background file as a floating "x".

8.0 DATA TRANSFER

This section provides instructions on how to transfer stored data on the handheld GPS unit to a personal computer. Prior to transferring data from the GPS unit to a computer, Microsoft ActiveSync and Trimble Data Transfer Utility software must be downloaded to the computer from the links provided in Section 2.2 (Required GPS Software). If a leased computer is utilized in which the operator can not download files, see the Note at the end of Section 8.0.

1) See Attachment A at the end of this SOP for instructions on how to transfer data from the GPS to a personal computer.

Note: If you are unable to properly transfer data from the GPS unit to a personal computer, the unit should be shipped to the project-specific contact listed in Section 1.0 where the data will be transferred and the GPS unit then shipped back to the vendor.

9.0 SHUTTING DOWN

This section provides instruction for properly shutting down the GPS unit.

1) When shutting down the GPS unit for the day, first click on the “X” in the upper right hand corner.
2) You will be prompted to ensure you want to exit TerraSync. Select Yes.
3) Power off the GPS unit by pushing the small green button located on the bottom face of the unit.
4) Place the GPS unit in its cradle to recharge the battery overnight. Ensure the green charge light is visible on the charging cradle.

ATTACHMENT A

How to Transfer Trimble GPS Data between Data Collector and PC
original 11/21/06 (5/1/08 update) – John Wright

Remember – Coordinate System, Datum, and Units are critical!!!

Trimble Data Collection Devices:
Standard rental systems include the Trimble ProXR/XRS backpack and the newer handheld GeoXT or GeoXH units. Some of the older backpack system may come with either a RECON "PDA-style" or a TSCe or TSC1 alpha-numeric style data collector.

The software on all of the above units should be Trimble TerraSync (v 2.53 or higher – current version is 3.20) and to the user should basically look and function similar. The newer units and software versions (which should always be requested when renting) include enhancements for data processing, real-time display functions, and other features.

Data Transfer:
Trimble provides a free transfer utility program to aid in the transfer of GIS and field data. The Data Transfer Utility is a standalone program that will run on a standard office PC or laptop.

To connect a field data collector such as a RECON, GeoXM, GeoXT, GeoXH, or ProXH, you must first have Microsoft ActiveSync installed to allow the PC and the data collector to talk to one another. A standard USB cable is also needed to connect the two devices.

A CD or USB drive is provided with the data collector for use in data transfer. If needed, these programs are also available without charge via the web at:

· **Trimble Data Transfer Utility** (v 1.38) program to download the RECON or GeoXH field data to your PC: http://www.trimble.com/datatransfer.shtml

· **ActiveSync** from Microsoft to connect the data collector to the PC. The latest version (v4.5) can be found at: http://www.microsoft.com/windowsmobile/activesync/default.mspx
(see page 2 for data transfer instructions)

To Transfer Data Collected in the Field:

· Install the Data Transfer and ActiveSync software installed on your PC
· Connect the RECON or GeoXH to your PC via an A/B USB cable (blade end and square end type "HP printer" style)
· ActiveSync should auto-detect the connection and recognize the data collector
· Make sure the data file desired is CLOSED in TerraSync prior to transfer
· Connect via ActiveSync as a guest (not a partnership)
· Run the Trimble Data Transfer Utility program on your PC
· Select "***GIS Datalogger on Windows CE***" or similar selection
· Hit the green connect icon to the right - the far right area should say "***Connected to ....***" if successful
· Select the "***Receive***" data tab (under device)
· Select "***Data***" from file types on the right
· Find the file(s) needed for data transfer. You can sort the data files by clicking on the date/time header
· Select or browse to a C-drive folder you can put this file for emailing
· When the file appears on the list, hit the "***Transfer All***"
· Go to your Outlook or other email, send a message to: John.Wright@tetratech.com (or GIS department)
· Attach the file(s) you downloaded from your C-drive. For each TerraSync data file created you should have a packet of multiple data files. All need to be sent as a group – make sure you attach all files (the number of files may vary – examples include: ssf, obx, obs, gix, giw, gis, gip, gic, dd, and car)

To Transfer GIS Data from PC to the Field Device (must be converted in Pathfinder Office):

· Obtain GIS file(s) desired from GIS Department and have converted to Trimble extension
· Contact John Wright (John.Wright@tetratech.com) if needed for file conversion and upload support
· The GIS file(s) can be quickly converted if requested and sent back to the field user in the needed "Trimble xxx.imp" extension via email – then quickly downloaded from Outlook to your PC for transfer
· Install the Data Transfer and ActiveSync software installed on your PC
· Connect the RECON or GeoXH to your PC via an A/B USB cable (blade end and square end type "HP printer" style)
· ActiveSync should auto-detect the connection and recognize the data collector
· Connect via ActiveSync as a guest (not a partnership)
· Run the Trimble Data Transfer Utility program on your PC
· Select "***GIS Datalogger on Windows CE***" or similar selection
· Hit the green connect icon to the right - the far right area should say "***Connected to ....***" if successful
· Select the "**Send**" data tab (under device)
· Select "**Data**" from file types on the right (you can also send background files)
· Browse to the location of the data on your PC (obtain the file from Pathfinder Office or from the person who converted the data for field use)
· Select the options as appropriate for the name and location of the data file to go on the data collector (usually you can choose main memory or a data storage card)
· When the file(s) appears on the list, hit the "***Transfer All***"
· Run TerraSync on the field device and open the existing data files. Your transferred file should appear (make sure you have selected Main Memory, Default, or Storage Card as appropriate)

STANDARD OPERATING PROCEDURE
SOP-OPS6

VEGETATION MANAGEMENT AT MEC SITES

1.0 SCOPE AND APPLICABILITY

This document is designed to set a standard operating procedure (SOP) for vegetation management during activities performed at Munitions and Explosives of Concern (MEC) sites. Inherently, a strong possibility exists that MEC and material potentially presenting an explosive hazard (MPPEH) may be encountered. The procedures detailed in SOP OPS1, UXO Detector-Aided Surface Surveys, provide specific guidance for UXO survey operations and equipment. SOP OPS4, MEC Management and Accountability, provides instructions and procedures to be followed in the event that suspect MEC/MPPEH is encountered. Additionally, MEC activities will be performed in accordance with all local, State, and federal regulations and will include all applicable DoD requirements.

2.0 BACKGROUND

Vegetation management may be required in preparation for field activities at MEC sites. Trees, brush, grass, and other vegetation can impede the performance of MEC operations, geophysical surveys, and related investigation and remediation activities. The degree of vegetation removal will be site-specific and based upon the conditions encountered and activities to be conducted. Following is a general discussion of the type of equipment/techniques that will be used.

- Hand held brush cutters (string or blade) will be used to cut light vegetation and small grassy areas.
- Mechanized lawn mowers will be used to mow larger grassy areas.
- Chain saws will be used in heavier brush areas, to trim tree limbs, and to cut small trees up to 2 inches in diameter.
- Tractor-mounted brush hogs will be used in larger areas and heavier brush areas.
- Brush/vegetation cutting will be left at the site of the area cleared. If this is impractical, a wood chipper may be utilized.

Smaller brush cutting/vegetation management operation will be conducted by the Unexploded Ordnance (UXO) staff. On larger project sites, subcontractors may be utilized. If it is necessary to utilize subcontractors, an UXO escort will be provided during subcontracted brush/vegetation management operation.

If the UXO escort is the only Tetra Tech UXO person on site, he/she will perform the functions of the UXOSO and UXOQC as stated below.

3.0 PERSONNEL QUALIFICATIONS

UXO personnel shall meet the training requirements as stated in DDESB TP-18. Subcontractors will meet the training and medical surveillance requirements as stated in the Tetra Tech NUS Health and Safety Guidance Manual. Where applicable, vegetation management equipment will only be operated by personnel licensed or certified on that equipment.

4.0 VEGETATION MANAGEMENT

Vegetation management at MEC sites may range from minor grass cutting and tree limb trimming to the total removal of all site vegetation. The extent and methods of vegetation management are driven primarily by the project specific scope of work, but will also be influenced by such factors as munition sensitivity, terrain, impacts to the environment, threatened or endangered species, current and future land use, available technology, and cost.

Prior to conducting vegetation management operations, a visual UXO surface survey will be conducted. All suspect MEC/MPPEH will be located and marked. UXO avoidance will be practiced during vegetation management operations. Vegetation management crews will not work within marked areas containing suspect MEC/MPPEH. Additionally, brush and grass will be cut no closer than 6 inches from the ground surface to avoid inadvertent contact with partially buried or shallow subsurface MEC.

Site Setup

The boundary of the work area will be established by land survey or GPS coordinates. Corner points of grids and start and end points of transects will also be located. Boundary lines of grids and transect lines will be marked using engineers flagging tape to provide visual guidance for the vegetation management crew when line of sight between stakes or markers is impeded.

UXO Escort will be provided for survey personnel and no stakes or markers will be driven into the ground until the immediate area of the stake or marker is surveyed and declared clear of surface and shallow subsurface anomalies.

Tree Cutting

Tree cutting will occur on a case-by-case basis as required to accomplish the site specific scope of work. Trees will be cut using chainsaws or hand tools. Generally, trees 2 inches in diameter and smaller will be cut as necessary to facilitate the planned site activities. Trees will be sectioned, if necessary, and removed from the immediate work area to avoid interfering with site operations.

Brush Cutting

Brush cutting will be accomplished using hand held brush cutters equipped with string or blade cutting attachments. Larger or heavier brush may require the use of chainsaws. Where appropriate, a tractor or skid-steer with a bush hog mower attachment may also be used. Brush will be cut to a height that allows clearance for UXO operations and geophysical equipment operation but no closer than 6 inches above the ground surface.

Grass Cutting

Grass cutting will be accomplished using mechanized lawn mowing equipment or hand held brush cutters equipped with string attachments. Grass will be cut to a height that allows clearance for UXO operations and geophysical equipment operation but no closer than 6 inches above the ground surface.

Alternative Methods

In rare instances, large scale vegetation clearance methods such as controlled burning or hydraulic ax deforestation may be necessary. An UXO escort will be provided during large scale vegetation clearance operations. At no time will UXO staff directly engage in controlled burning operations or in the operation of hydraulic ax deforestation equipment.

Quality Control

The UXOQC will review the definable features of work prior to the start of work each day. A new definable feature of work will receive a preparatory phase QC inspection prior to the start of work. This inspection is recorded on the attached Quality Control Surveillance Report. Work started on a new

definable feature of work will receive an initial phase QC inspection. During MEC management and accountability the UXOQC, or Senior UXO Technician if there is no UXOQC, will recheck 25-percent of the first four units of work (grids or transects). If quality requirements are not met on any unit, that unit will be rejected and the UXO Team will rework the entire unit. The initial phase QC inspection will be documented on the attached Quality Control Surveillance Report. Once quality requirements are met for four units in a row, the UXOQC, or Senior UXO Technician if there is no UXOQC, may reduce the level of rechecks to 10-percent of each unit (grids or transects). If at any time a unit fails the quality control check, the complete unit will be reworked and the rechecks will be increased to 25-percent until four units in a row pass the recheck. These follow up phase QC inspections will be recorded on the attached Quality Control Surveillance Report. All work will be conducted in accordance with the MEC SAP and the SOPs attached to that MEC SAP. All requested changes to the approved MEC SAP will be documented on the attached Record-of-Change Form and submitted to the PM and UXO Manager for action/approval. The UXOQC will prepare the attached Daily Quality Control Report for each day worked summarizing the definable features or work inspected, the phase of work, the locations, and personnel at the work site.

5.0 VEGETATION DISPOSAL

Vegetation disposal must be coordinated with the facility environmental office and, as applicable, the facility natural resources office. Provided that site activities do not result in significant quantities of material, the preferred method of vegetation disposal will be on-site disposal. Vegetation will be removed from the immediate work area to avoid interfering with site activities, and allowed to naturally decompose.

A wood chipper may also be used to effectively dispose of vegetation without removing the vegetation from the work site. Wood chips will be disposed of away from the immediate work area to avoid interfering with site activities when possible. If necessary, wood chips will be spread over the work site to a depth of no greater than 4 inches to avoid interference with detection depth capabilities of UXO and geophysics equipment.

6.0 SAFETY

General safety precautions are located in the Tetra Tech NUS Health and Safety Guidance Manual. Specific guidelines are located in the site-specific Health and Safety Plan (HASP) and the Accident Prevention Plan (APP).

Personal Protective Equipment (PPE)

PPE for vegetation management operations will be level D protection with the following additions:

- Logging helmet with attached face shield
- Chainsaw chaps
- Hearing protection
- Leather work gloves

Personnel Safety

The UXO Safety Officer (UXOSO) will be on-site at all times during vegetation management operations. The primary responsibilities of the UXOSO during vegetation management activities are:

- To provide a safety brief detailing the operation, safety, and maintenance of the specific equipment being utilized, this briefing will be documented on the attached Tailgate Safety Briefing form;

- To insure that MEC/MPPEH hazards remain a primary concern for personnel involved in vegetation management activities;

- To insure that PPE is serviceable and worn properly during vegetation removal activities; and

- To insure that individual personnel utilizing vegetation removal equipment maintain safe working distances from other personnel within the work area.

Additionally, an UXO Escort will be provided at all times during vegetation management activities. The UXO Escort will be utilized even when UXO Staff perform vegetation management. This will provide a more focused observation of the work area for MEC/MPPEH and related hazards.

Equipment Safety

Equipment will be inspected for serviceability daily prior to the commencement of vegetation management activities. Periodic spot checks will also be conducted throughout the day to insure that chains and blades remain properly tightened and sharpened. All equipment will be operated and maintained in accordance with the manufacturer's recommendations.

7.0 REPORTS

Senior UXO Technicians on site will complete the attached Field Activity Daily Log for each day work is conducted. The log will be used to document and report significant events, logbook entries, phone calls, visitors, and other items of interest to the PM and UXO Manager. This report will be submitted as soon as possible at the end of the work day. The attached Field Activity Weekly Log is a summary of the week's events.

TETRA TECH NUS, INC.

Project:			
Tailgate Safety Briefing			
Date: _____		**Location:** _____	
Time: _____		**Team #:** _____	
1. Reason for Briefing:			
	Daily Safety Briefing		**New Site Procedure**
	Initial Safety Briefing		**New Site Information**
	New Task Briefing		**Review of Site Information**
	Periodic Safety Meeting		**Other: (Specify)**

2. Personnel Attending

Name	Signature	Position

Briefing Given By:

Name	Signature	Position

TETRA TECH NUS, INC.

3. Topics: (Check All That Apply)			
	Site Safety Personnel		Decontamination Procedures
	Site/Work Area Description		Emergency Response/Equipment
	Physical Hazards		On-Site Injuries/Illness
	Chemical/Biological Hazards		Reporting Procedures
	Heat/Cold Stress		Directions to Medical Facility
	Work/Support Zones		Drug and Alcohol Policies
	PPE		Medical Monitoring
	Safe Work Practices		Evacuation/Egress Procedures
	Air Monitoring		Communications
	Task Training		Confined Spaces
	OE Precautions		Other:
4. Remarks:			

TETRA TECH NUS, INC.

Name	Signature	Position

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	
NO.	
SHEET OF	

PROJECT NAME:	PROJECT NO:
FIELD ACTIVITY SUBJECT:	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
PERSONNEL ON SITE:	
SIGNATURE:	DATE:

TETRA TECH NUS, INC.

FIELD ACTIVITY DAILY LOG

DATE	
NO.	
SHEET	OF

PROJECT NAME:	PROJECT NO:
FIELD ACTIVITY SUBJECT:	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS (CONTINUED):	

.

TETRA TECH NUS, INC.

FIELD ACTIVITY WEEKLY LOG

DATE	
NO.	
SHEET OF	

PROJECT NAME:	PROJECT NO:
FIELD ACTIVITY SUBJECT:	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
PERSONNEL ON SITE:	
SIGNATURE:	DATE:

APPENDIX B

VISUAL SAMPLE PLAN
(ON CD)

Transect Sampling for Unexploded Ordnance (UXO) Target Detection

Summary
This report summarizes the probability of traversing and detecting a target area of specific size and shape for different transect spacing's. Simulation details and a power curve estimate how well the specified design would detect the target.

The following table summarizes the sampling design developed.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Ensure high probability of traversing and detecting a target area that has a specified size and shape
Required Probability of Traversing the Target	100%
TARGET AREA AND TRANSECT INPUTS	
Type of Sampling Design	**Transects**
Transect Pattern	**Parallel**
Transect Width	**3 feet**
Area of target area	**125663.71 ft^2**
Shape of target area of concern	**Circular**
Radius of target area of concern	**200 feet**
SIMULATION PARAMETERS FOR PROBABILITY OF DETECTION	
Formula for calculating the probability of traversing and detecting target area	Monte Carlo Simulation (method described below)
Decision Rule	Flag if at least 90% confident an area has density greater than background density
Background Density of the Site	5 anomalies / acre
Expected Target Area Density Above Background	10 anomalies / acre Target average
Distribution of target area density above background	Bivariate Normal
Transect spacing evaluation range	20 to 100 feet
Instrument false negative rate	15%
Minimum precision	0.1
Maximum error	0.05
Search Window Diameter	178 feet
PROPOSED TRANSECT DESIGN	
Computed spacing between transects	22.6726 feet
Computed spacing between transect centers	25.6726 feet

Primary Sampling Objective
The primary purpose of sampling at this site is to traverse and detect target areas of a given size and shape with required high probability. The transect design tools provide a statistically defensible method to use transect survey data that covers only a small proportion of the total study area.

Selected Sampling Approach
The specified sampling approach was random parallel transect sampling. If parameters change from those specified in the table above, then the probability of detecting the target area will be different from those computed by VSP and reported here.

Simulation Details
To generate an estimated probability on a graph, VSP runs a Monte Carlo simulation based on the entered parameters. For each iteration, VSP creates a square site with the target area centered at the

origin and rotated at a random angle. A parallel transect pattern is placed randomly so that 3 feet wide transects are parallel to the x axis.

VSP calculates the total area of the site traversed by transects, A_b, which can vary for each iteration. The expected number of detected background anomalies, λ_b, is calculated as $\lambda_b = D_b A_b (1 - P_{fn})$ where D_b is the background density of 5 anomalies / acre and P_{fn} is the instrument false negative rate of 0.15. A random number of detected background anomalies is generated using a Poisson distribution with parameter λ_b. VSP randomly places these anomalies within the traversed areas of the site.

To simulate the number of additional anomalies in the target area, VSP uses an approximation technique to randomly place additional detected anomalies in the traversed areas of the target area. Portions of transects overlapping the target area are divided into small sections. For each section, the quantile of the target area in which it lies is determined, the expected number of additional anomalies is determined, and a random number of detected anomalies is determined using a Poisson distribution and placed within the section.

VSP uses a moving window along each transect to determine which areas have density significantly greater than background density. The window moves 1/6 of the search window diameter for each iteration. Where D_a is the actual density for the current window, the null and alternative hypotheses for determining if the area inside the window has density significantly greater than background density, D_b, are as follows:

Null Hypothesis: $H_o : D_a \leq D_b$

Alternative Hypothesis: $H_a : D_a > D_b$

VSP checks each window to see if the actual number of detected anomalies is significantly greater than the expected number of anomalies for a Poisson distribution. If any windows intersecting the target area are flagged as significant, then we determine the target area has been detected.

250 iterations are run to begin the simulation to estimate a probability of detection. If the specified Maximum Error has not been achieved, additional iterations are run until the Maximum Error is met. If the total number of iterations is *n* and the proportion of target areas detected is *p*, then another iteration is run if

Maximum Error < $1.96 * \sqrt{\frac{p(1-p)}{n}}$

The quantity $1.96 * \sqrt{\frac{p(1-p)}{n}}$ is the 95th percentile of the standard error of the mean for a binomial distribution. We are 95% certain that the estimated probability is close to the true probability (within the maximum error). When all iterations are completed, VSP tabulates the estimated probability the target area has been detected, *p* / *n*. VSP repeats this process for a number of transect spacings determined by simulation results and the minimum precision specified.

This report was automatically produced* by Visual Sample Plan (VSP) software version 5.1.1.

Software and documentation available at http://dqo.pnl.gov/vsp

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* - The report contents may have been modified or reformatted by end-user of software.

Transect Sampling for Unexploded Ordnance (UXO) Target Detection

Summary

This report summarizes the probability of traversing and detecting a target area of specific size and shape for different transect spacing's. Simulation details and a power curve estimate how well the specified design would detect the target.

The following table summarizes the sampling design developed.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Ensure high probability of traversing and detecting a target area that has a specified size and shape
Required Probability of Traversing the Target	100%
TARGET AREA AND TRANSECT INPUTS	
Type of Sampling Design	**Transects**
Transect Pattern	**Parallel**
Transect Width	**3 feet**
Area of target area	**125663.71 ft^2**
Shape of target area of concern	**Circular**
Radius of target area of concern	**200 feet**
SIMULATION PARAMETERS FOR PROBABILITY OF DETECTION	
Formula for calculating the probability of traversing and detecting target area	Monte Carlo Simulation (method described below)
Decision Rule	Flag if at least 90% confident an area has density greater than background density
Background Density of the Site	5 anomalies / acre
Expected Target Area Density Above Background	20 anomalies / acre Target average
Distribution of target area density above background	Bivariate Normal
Transect spacing evaluation range	20 to 100 feet
Instrument false negative rate	15%
Minimum precision	0.1
Maximum error	0.05
Search Window Diameter	306 feet
PROPOSED TRANSECT DESIGN AND COST INFORMATION	
Computed spacing between transects	53.6748 feet
Computed spacing between transect centers	56.6748 feet

Primary Sampling Objective

The primary purpose of sampling at this site is to traverse and detect target areas of a given size and shape with required high probability. The transect design tools provide a statistically defensible method to use transect survey data that covers only a small proportion of the total study area.

Selected Sampling Approach

The specified sampling approach was random parallel transect sampling. If parameters change from those specified in the table above, then the probability of detecting the target area will be different from those computed by VSP and reported here.

Simulation Details

To generate an estimated probability on a graph, VSP runs a Monte Carlo simulation based on the entered parameters. For each iteration, VSP creates a square site with the target area centered at the

origin and rotated at a random angle. A parallel transect pattern is placed randomly so that 3 feet wide transects are parallel to the x axis.

VSP calculates the total area of the site traversed by transects, A_b, which can vary for each iteration. The expected number of detected background anomalies, λ_b, is calculated as $\lambda_b = D_b A_b (1 - P_{fn})$ where D_b is the background density of 5 anomalies / acre and P_{fn} is the instrument false negative rate of 0.15. A random number of detected background anomalies is generated using a Poisson distribution with parameter λ_b. VSP randomly places these anomalies within the traversed areas of the site.

To simulate the number of additional anomalies in the target area, VSP uses an approximation technique to randomly place additional detected anomalies in the traversed areas of the target area. Portions of transects overlapping the target area are divided into small sections. For each section, the quantile of the target area in which it lies is determined, the expected number of additional anomalies is determined, and a random number of detected anomalies is determined using a Poisson distribution and placed within the section.

VSP uses a moving window along each transect to determine which areas have density significantly greater than background density. The window moves 1/6 of the search window diameter for each iteration. Where D_a is the actual density for the current window, the null and alternative hypotheses for determining if the area inside the window has density significantly greater than background density, D_b, are as follows:

Null Hypothesis: $H_o : D_a \leq D_b$

Alternative Hypothesis: $H_a : D_a > D_b$

VSP checks each window to see if the actual number of detected anomalies is significantly greater than the expected number of anomalies for a Poisson distribution. If any windows intersecting the target area are flagged as significant, then we determine the target area has been detected.

250 iterations are run to begin the simulation to estimate a probability of detection. If the specified Maximum Error has not been achieved, additional iterations are run until the Maximum Error is met. If the total number of iterations is *n* and the proportion of target areas detected is *p*, then another iteration is run if

Maximum Error < $1.96 * \sqrt{\frac{p(1-p)}{n}}$

The quantity $1.96 * \sqrt{\frac{p(1-p)}{n}}$ is the 95th percentile of the standard error of the mean for a binomial distribution. We are 95% certain that the estimated probability is close to the true probability (within the maximum error). When all iterations are completed, VSP tabulates the estimated probability the target area has been detected, *p* / *n*. VSP repeats this process for a number of transect spacings determined by simulation results and the minimum precision specified.

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Transect Sampling for Unexploded Ordnance (UXO) Target Detection

Summary
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The following table summarizes the sampling design developed.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Ensure high probability of traversing and detecting a target area that has a specified size and shape
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Transect Pattern	**Parallel**
Transect Width	**3 feet**
Area of target area	**125663.71 ft^2**
Shape of target area of concern	**Circular**
Radius of target area of concern	**200 feet**
SIMULATION PARAMETERS FOR PROBABILITY OF DETECTION	
Formula for calculating the probability of traversing and detecting target area	Monte Carlo Simulation (method described below)
Decision Rule	Flag if at least 90% confident an area has density greater than background density
Background Density of the Site	5 anomalies / acre
Expected Target Area Density Above Background	30 anomalies / acre Target average
Distribution of target area density above background	Bivariate Normal
Transect spacing evaluation range	20 to 100 feet
Instrument false negative rate	15%
Minimum precision	0.1
Maximum error	0.05
Search Window Diameter	359 feet
PROPOSED TRANSECT DESIGN	
Computed spacing between transects	73.0958 feet
Computed spacing between transect centers	76.0958 feet

Primary Sampling Objective
The primary purpose of sampling at this site is to traverse and detect target areas of a given size and shape with required high probability. The transect design tools provide a statistically defensible method to use transect survey data that covers only a small proportion of the total study area.

Selected Sampling Approach
The specified sampling approach was random parallel transect sampling. If parameters change from those specified in the table above, then the probability of detecting the target area will be different from those computed by VSP and reported here.

Simulation Details
To generate an estimated probability on a graph, VSP runs a Monte Carlo simulation based on the entered parameters. For each iteration, VSP creates a square site with the target area centered at the

origin and rotated at a random angle. A parallel transect pattern is placed randomly so that 3 feet wide transects are parallel to the x axis.

VSP calculates the total area of the site traversed by transects, A_b, which can vary for each iteration. The expected number of detected background anomalies, λ_b, is calculated as $\lambda_b = D_b A_b (1 - P_{fn})$ where D_b is the background density of 5 anomalies / acre and P_{fn} is the instrument false negative rate of 0.15. A random number of detected background anomalies is generated using a Poisson distribution with parameter λ_b. VSP randomly places these anomalies within the traversed areas of the site.

To simulate the number of additional anomalies in the target area, VSP uses an approximation technique to randomly place additional detected anomalies in the traversed areas of the target area. Portions of transects overlapping the target area are divided into small sections. For each section, the quantile of the target area in which it lies is determined, the expected number of additional anomalies is determined, and a random number of detected anomalies is determined using a Poisson distribution and placed within the section.

VSP uses a moving window along each transect to determine which areas have density significantly greater than background density. The window moves 1/6 of the search window diameter for each iteration. Where D_a is the actual density for the current window, the null and alternative hypotheses for determining if the area inside the window has density significantly greater than background density, D_b, are as follows:

Null Hypothesis: $H_o : D_a \leq D_b$

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VSP checks each window to see if the actual number of detected anomalies is significantly greater than the expected number of anomalies for a Poisson distribution. If any windows intersecting the target area are flagged as significant, then we determine the target area has been detected.

250 iterations are run to begin the simulation to estimate a probability of detection. If the specified Maximum Error has not been achieved, additional iterations are run until the Maximum Error is met. If the total number of iterations is *n* and the proportion of target areas detected is *p*, then another iteration is run if

Maximum Error < $1.96 * \sqrt{\frac{p(1-p)}{n}}$

The quantity $1.96 * \sqrt{\frac{p(1-p)}{n}}$ is the 95th percentile of the standard error of the mean for a binomial distribution. We are 95% certain that the estimated probability is close to the true probability (within the maximum error). When all iterations are completed, VSP tabulates the estimated probability the target area has been detected, *p* / *n*. VSP repeats this process for a number of transect spacings determined by simulation results and the minimum precision specified.

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APPENDIX C

MEC SI FIELD FORMS
(ON CD)

APPENDIX C

WORK APPROVALS AND FIELD REPORTS
FOR
MUNITIONS RESPONSE PROGRAM
SITE INSPECTIONS AT 10 MUNTIONS RESPONSE PROGRAM RANGES
MEC (DETECTOR-AIDED SURFACE SWEEP / GEOPHYSICS) INVESTIGATION
NAVAL SUPPORT FACILITY INDIAN HEAD-STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

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SECTION 1	**WORK APPROVALS**
SECTION 2	**DAILY QUALITY CONTROL REPORTS**
SECTION 3	**SAFETY DAILY LOGS**
SECTION 4	**FIELD ACTIVITY DAILY LOGS**
SECTION 5	**FIELD ACTIVITY WEEKLY LOGS**

SECTION 1

WORK APPROVALS

Class A Work Approval Permit & Record of CATEX
Naval Support Facility - Indian Head

Section A. **Customer Supplied Information** (by applicant) Tracking Number: 10-012

Name of Applicant: Nick Carros Date of Application: 10/2/2009 Phone ext.: x2263

Project Name: Stump Neck: Soil Sampling at 10 MRP Sites Applicant Email: nicholas.carros@navy.mil

Organization Submitting Application: NAVFAC Organization Requesting Action: NDW

Work Request/ Service Ticket: Anticipated Dates of Work: Start: 11/16/2009 Completion: 1/29/2010

Expiration Date: 180 Days from Date of Approval Building Number(s):

Section B. **Site Issues** (by CWAP Coordinator or Authorized Personnel)

Checked Issues must be approved by the appropriate Resource Manager.

Work Restriction Area	Approval Date	Work Restriction Area	Approval Date
☑ ESQD Arcs (K=18, K=24)	11/5/2009	☐ MDE, WMA Stormwater Management	
☑ Survey Control/Property Points	11/13/2009	☐ MDE, WMA Sediment Erosion Control	
☐ Other Pipe Work		☐ MDE, WMA Notice of Intent (NOI)	
☑ Installation Restoration (IR) Site	11/13/2009	☑ Archeological Area	11/13/2009
☐ Worker Notification Area		☐ Historic Building	
☑ Surface Water/ Wetlands Buffer	10/28/2009	☑ Buried Utilities -- Utility Location Required	N/A
☑ 100 Year Flood Plain	10/28/2009	☑ Munitions Response (MRP) Site	11/13/2009
☑ Eagle Nest Buffer	10/28/2009	☑ Other Work Restriction Area	11/13/2009
☑ Natural Resources/Earth Disturb.	11/13/2009	☐ No Work Restriction Areas	

Conditions for Approval (Resource Manager Consulted)

See next page for list of Work Conditions.

Site Restrictions Verification (by NEPA Program Manager or Authorized Personnel)

Signature of Verifying Official _____ Date _____

Section C. – Permit Receipt (by applicant)

I have read and understood the conditions for approval listed in Section B. All work will be performed in accordance with these conditions:

Applicant: _____ Date: _____

Note: This permit is not valid without the signature of the NEPA Program Manager and Applicant. Signed permit must be on-site while all work is being performed.

Class A Work Approval Permit & Record of CATEX
Naval Support Facility - Indian Head

MRP Conditions
Work will sample 10 MRP Sites at Stump Neck. Workers must adhere to the requirements specified in the ESS Determination Request (see attachment) and follow all safety procedures listed in the work plan.

IR_Conditions
Work area overlaps IR Sites 19, 28, 36, 37, and 65. Follow all safety procedures listed in the work plan.

SurfaceWaterWetlandsBuffer_Conditions
Work will occur within streams and wetlands. Minimize earth and vegetation disturbance.

EagleNestBuffer_Conditions
Work at UXO-2 “Area 8" and UXO-5 “Advanced IED Area” occurs within 750-ft of the "Hypervelocity #2" and "Area 8" bald eagle nests. Work requiring the use of loud, disruptive equipment/instruments (e.g., power tools, chain saws, backhoes) at UXO-2 and UXO-5 must be completed prior to the eagle nesting season (starts Dec. 15th). However, there are no time-of-year restrictions at UXO-2 or UXO-5 for the use of non-disruptive equipment (e.g., hand tools).

Archeological_Conditions
Per SHPO determination (see attached e-mail), soil sampling at Stump Neck would not result in an adverse effect to archeological resources. However, contractor needs to be made aware of the boundaries of the archeologically sensitive areas where sampling will occur and try to minimize earth disturbance. Contractor must coordinate with the Cultural Resources Manager, Tommy Wright (x2263), before sampling within archeological sites. Contractor must stop work and notify the Cultural Resources Manager immediately of any discoveries of potential cultural resources (e.g., projectile points, pottery, funerary remains, building foundations).

100YearFloodPlain_Conditions
Work may occur within the 100 year floodplain. Minimize earth disturbance.

SurveyControl_Conditions
Contractor will either avoid disturbing survey markers or will be responsible for replacement of any disturbed survey markers. Contact Bob Wetherald (x4406) for further guidance.

BuriedUtilities_Conditions
Utility Location Required

ESQDArcs_Conditions
Work will occur within K18 and K24 arcs. The contractor must follow all requirements specified in the ESS Determination Requests, signed by NOSSA 5 November 2009 (see attachment).

NaturalResourcesEarthDisturbance_Conditions

- Soil samples will be collected via hand auger and direct-push technology (DPT) between 0-4 ft. below ground surface (bgs) at different locations based on the detector-aided sweeps and geophysical surveys. Minimize earth disturbances at each sampling location.
- All boring holes must be filled and capped per Maryland State Regulations. If insufficient soil is available to fill the hole to the ground surface, bentonite pellets mixed with the soil will be used to backfill the hole, and hydrated with potable water.
- Any waste generated during sampling will be disposed of according to work plan, so as to not contribute to further environmental contamination or pose a threat to public health or safety.
- Sampling at UXO-1, 2, 4, 5, 10, 12, 26, and 28 will occur within species protections areas (Chicamuxen Creek Marsh, Porter Woods, and West Stump Neck Shoreline Area). Minimize earth and vegetation disturbance.

Other_Conditions

- Waste material/equipment generated from the work areas must be disposed of in the proper manner and not left on site.
- Contractors must check daily/weekly with Larry Kijek (x6871) and brief him on their daily/weekly work plans, in order to avoid any issues with ESQD arcs or explosives operations. Extensive coordination with Larry Kijek and Range 3 is required for any sampling within Range 3, which conducts daily explosives operations.

Class A Work Approval Permit & Record of CATEX
Naval Support Facility - Indian Head

Section D. Project Details

Project Description:

See next page for project description.

Location Description:

UXO-1, UXO-02, UXO-04, UXO-05, UXO-10, UXO-12, UXO-21, UXO-23, UXO-26, and UXO-28.

Does project involve removing, breaking or opening any piping, tubing, hoses or tanks? ◯ Yes ◉ No

If yes what is the pipe, tube or hose used for?: _____

Other pipework comments:

Section E. Resource Manager Contact Information

Jim Humphreys Bldg. 103 x2261 james.k.humphreys@navy.mil
Installation Restoration (IR) Sites; Munitions Response Program (MRP) Sites; Worker Notification Areas

Seth Berry Bldg. 289 x2273 seth.m.berry@navy.mil
Natural Resources; Earth Disturbance; Surface Water; Wetlands; 100-Year Floodplain; Bald Eagle Protection Areas

Tommy Wright Bldg. 289 x2260 thomas.a.wright@navy.mil
Archeological Areas; Historic Buildings

Diana Rose Bldg. 289 x2267 diana.rose@navy.mil
Sanitary and Industrial Wastewater

Sharon Brown Bldg. 482 x1712 sharon.brown@navy.mil
Explosives Safety Quantity-Distance (ESQD) Arcs

Jim Humphreys Bldg. 103 x2261 james.k.humphreys@navy.mil
MDE, WMA Stormwater Management, Sediment Erosion Control, Notices of Intent (NOI)

Bob Wetherald Bldg. 551 x2168 bob.wetherald@navy.mil
Survey Control Points

Dennis Tomlinson Bldg. 1601 x2469 dennis.tomlinson@navy.mil
Worker Safety (OSHA)

10-012 Project Description

Project will perform site inspections (SI) of ten Munitions Response Program (MRP) sites located throughout the Stump Neck Annex, which may contain munitions and explosives of concern (MEC) and/or munitions constituents (MC). The primary objective of the SI is to determine whether further response actions or remedial investigations are needed to restore any of the ten sites to an acceptable environmental condition. The SI for the ten MRP sites consists of two different investigations, which will be conducted in two phases. The equipment used for the investigations will consist of a Geometric G858 Magnetometer, Geo Nicacs EM61-MK2, hand-held metal detectors, hand tools, GPS (non-transmitting), direct-push technology (DPT) rig, and hand augers.

The first phase will be conducted at all ten UXO (Unexploded Ordnances) sites. Phase one will consist of the MEC investigations which includes detector-aided surface sweeps for MEC, followed by subsurface geophysics investigations. Limited vegetation removal will be performed prior to phase one and will be limited to surface clearing.

Phase one results will be used to determine the locations for the second phase: sampling (surface soil, subsurface soil, sediment, surface water, and ground water). Sampling within the MRP site will be focused in areas with observed munitions debris, suspect MEC, or anomaly clusters to determine if explosive contamination is present. Sampling will include the following:

UXO-01 "Air Blast Pond"

- Total of 46 soil samples at 20 locations;
    - 40 surface samples collected from 0 to 6 and 0 to 24 in. below ground surface(bgs);
    - Six subsurface samples collected from 2 to 4 ft. bgs;
- All soil samples will be collected via hand auger;

UXO-02 "Area 8"

- Total of 120 soil samples at 40 locations;
    - 80 surface soil samples from 0 to 6 and 0 to 24 in. bgs;
    - 20 subsurface samples collected from 2-4 and 4-6 ft. bgs;
- Seven sediment samples collected from 0-6 in.;
    - Three sediment samples under surface water flow within Chicamuxen Creek in areas where training was known to occur;
    - Four sediment samples from within the pond;
- Six groundwater samples;
    - Three will be collected from existing wells and the rest from new temporary monitoring wells installed in soil borings;
- All soil samples will be collected via hand auger and DPT;

UXO-04 "Basic IED Area"

- Total of 80 soil samples at 20 locations;
    - 40 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
    - 40 subsurface samples collected from 2 to 4 and 4 to 6 ft. bgs;
- All soil samples will be collected via hand auger;

UXO-05 "Advanced IED Area"

- Total of 80 soil samples at 20 locations.
    - 40 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
    - 40 subsurface samples collected from 2 to 4 and 4 to 6 ft. bgs;
- All soil samples will be collected via hand auger;

UXO-10 "Stump Neck Impact Area"

- Total of 40 soil samples at 10 locations;
    - 20 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
    - 20 subsurface samples collected from 2 to 4 and 4 to 6 ft. bgs;
- All soil samples will be collected via hand auger and DPT;

UXO-12 "Torpedo Burial Site"

- Total of 20 subsurface soil samples at 10 locations from 2 to 4 and 4 to 6 ft. bgs;
- Two sediment samples, collected from 0 to 6 in. bgs in the drainage channel;
- One surface water sample collected in the drainage channel;
- All soil samples will be collected via hand auger and DPT;

UXO-21 "Test Area 1"

- A total of 41 soil samples at 21 locations;
    - 21 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
- All soil samples will be collected via hand auger;

UXO-23 "Torpedo Casing Disposal Area"

- A total of 20 subsurface soil samples at 10 locations from 2 to 4 and 4 to 6 ft. bgs;
- All soil samples will be collected via hand auger and DPT;

UXO-26 "The Valley Impact Area"

- Detector-Aided Sweeps and Geophysical Surveys will be conducted along 400-ft transects within this area, outside of other delineated UXO sites, active ranges, or other inaccessible areas;

UXO-28 "EOD School Demolition Area"

- Total of 40 soil samples at 20 locations;
    - 20 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
- All soil samples will be collected via hand auger.

Contractor trailers and a port-o-john will be sited at the intersection of Archer Avenue and Roach's Run, near Building 43SN. Electrical power for the trailers will be provided by a small generator.

POTOMAC RIVER

CHICAMUXEN CREEK

CHICAMUXEN WILDLIFE MANAGEMENT AREA

Basic IED Area

Advanced IED Area

Valley Impact Area

Air Blast Pond

EOD School Demo Area

Torpedo Burial Site

SN Impact Area

Area 8

Torpedo Casing Dispo

Test Area 1

NSF-IH Work Approval Permit Layout

Legend

- Work Area
- Cultural Resources Protection
- Species Protection Areas
- Wetlands

Streams

- Dry
- Intermittent
- Permanent
- Rivers
- Surface Water Bodies
- Inactive Eagle Nest - 750 ft
- Active Eagle Nest - 750 ft
- Topography - 5-foot
- Potable Water Wells
- Monitoring Wells
- Survey Control Points
- Fire Hydrants
- Potable Valve
- River Water Valve
- Underground Telephone/Fiber Optics
- Underground Electric
- Stormwater
- Sanitary Sewer
- Potable Water
- River Water
- Industrial
- Poles
- Buildings
- Trailers
- Cargo Boxes
- Roads and Parking Lots
- Munitions Response Areas
- IR Sites
- Boundary
- K24 Remote Operations
- K18 (Intraline) Restrictions
- Charles Cnty Roads
- Charles County

Permit NOT Valid Without Signature

DISCLAIMER: Utilities depicted are believed to be accurate to +/- 15 feet.

NOTE: While performing work, if any underground utilities or item(s) are detected and are not shown on this plan, please detail at approximate location and give description of item(s) to CWAP Coordinator.

N W E S

0 250 500 1,000 1,500 Feet

Produced by ERG
20 October 2009

10-012 "Stump Neck: Soil Sampling of 10 MRP Sites"

DEPARTMENT OF THE NAVY
NAVAL ORDNANCE SAFETY AND SECURITY ACTIVITY
FARRAGUT HALL
3817 STRAUSS AVENUE, SUITE 108
INDIAN HEAD, MD 20640-5151

8020
Ser N537/1871
5 Nov 09

From: Commanding Officer, Naval Ordnance Safety and Security Activity
To: Commanding Officer, Naval Facilities Engineering Command, Washington

Subj: EXPLOSIVES SAFETY SUBMISSION DETERMINATION REQUEST FOR NAVAL SUPPORT FACILITY INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Ref: (a) E-mail NAVFAC Washington Mr. N. Carros/NOSSA (N537) Mr. R. Urbanski of 30 Oct 09 (w/encl)
(b) NOSSAINST 8020.15A, Explosives Safety Review, Oversight, and Verification of Munitions Responses, of 2 Feb 07
(c) NAVSEA OP 5, Revision 7

1. As requested by reference (a), the Naval Ordnance Safety and Security Activity (NOSSA) reviewed the subject Explosives Safety Submission (ESS) Determination Request in accordance with references (b) and (c). Based on the information provided, NOSSA has determined that an ESS is not required to conduct site preparation, site inspection, geophysical survey, and soil sampling operations at Naval Support Facility Indian Head, Stump Neck Annex, Indian Head, Maryland at the following sites: Air Blast Pond, Area 8, EOD School Demolition Area, Basic IED Area, Advanced IED Area, Stump Neck Impact Area, Test Area 1, Valley Impact Area, Torpedo Burial Site, and Torpedo Casing Disposal Area.

2. As outlined in your request, we understand that the likelihood of encountering munitions and explosives of concern (MEC) or Material Potentially Presenting an Explosive Hazard (MPPEH) during the proposed operations has been determined to be low and the following conditions apply:

a. An unexploded ordnance (UXO) qualified Technician will provide anomaly avoidance services during all planned operations.

b. Planned operations are:

(1) Site survey and mapping to include grid/transect setup.

(2) Detector aided surface survey. No discovered MEC/MPPEH is to be moved or disturbed in any manner.

(3) Geophysical survey. UXO Technicians are authorized to remove non-munitions debris from the surface.

(4) Soil sampling to a depth of 6 feet by means of hand tools or Direct Push Technology. A UXO Technician must verify the absence of anomalies in the sampling location prior to sampling.

c. Authorization is granted for project personnel to be within the unbarricaded (K18) intraline (IL) Explosives Safety Quantity Distance arcs emanating from nearby potential explosion sites (PESs). When the above listed operations occur at less than IL distance from a PES, work schedules must be coordinated to minimize the number of non-essential personnel exposed to the potentially hazardous effect from the PES.

3. However, if surface MEC or MPPEH is discovered on the site while employing anomaly avoidance techniques, the item will be avoided and its location and description will be reported to the cognizant Explosive Safety Officer and the Navy Project Manager. An emergency response from the cognizant Explosive Ordnance Disposal detachment will be requested, if needed.

4. The NOSSA point of contact for this ESS determination is Mr. Rick Urbanski, who can be contacted at DSN 354-5636 or commercial at 301-744-5636.

TAMMY K. SCHIRF
By direction

Copy to: (see next page)

Subj: EXPLOSIVES SAFETY SUBMISSION DETERMINATION REQUEST FOR NAVAL SUPPORT FACILITY INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Copy to:
CNO (A. Malson; W. Holmes and E. Newbaker)
NAVFAC HQ (R. Sadorra)
NAVFAC WASHINGTON (J. Rail)
NSASP (J. Bossart and N. Carros)
NAVEODTECHDIV INDIAN HEAD (L. Kijek)
NOSSA ESSOLANT (B. Sizemore and D. Moore)

From: Adam Humphreys
To: IH_CWAP
Date: 11/10/2009 3:39 PM
Subject: Fwd: FW: 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites" -Archeological Site Information

Dave, FYI.

>>> "Wright, Thomas CIV NAVFAC Washington, Environmental" <thomas.a.wright@navy.mil> 11/10/2009 3:34 PM >>>
Guys,

In those areas where we have UXO issues, need to tell the techs that if they start bringing up material that is obliviously not soil then to stop and contact me. For those areas where we do not have UXO issues, let me know of the dates and I will coordinate to get out there.
Thanks
T

-----Original Message-----
From: B Cole [mailto:BCole@mdp.state.md.us]
Sent: Tuesday, November 03, 2009 7:57 AM
To: Wright, Thomas CIV NAVFAC Washington, Environmental
Subject: RE: 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites" -Archeological Site Information

Ok Tommy. I think I'm comfortable with a no adverse effect determination for the sampling itself. The Navy should be sure to alert the contractor that they are working in archeologically sensitive areas and to try to minimize the extent of any ground disturbance and immediately report any discoveries. I assume the Navy will be closely overseeing the sampling. Thanks for asking. Have a great day,

Beth Cole
Administrator, Project Review & Compliance Maryland Historical Trust 100 Community Place Crownsville, MD 21032
410-514-7631
410-987-4071 (fax)
bcole@mdp.state.md.us
http://mht.maryland.gov
Please consider the environment before printing.

-----Original Message-----
From: Wright, Thomas CIV NAVFAC Washington, Environmental [mailto:thomas.a.wright@navy.mil]
Sent: Tuesday, November 03, 2009 6:32 AM
To: B Cole
Subject: FW: 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites" -Archeological Site Information

Hi Beth,

From what I understand from the PM's, is that the vegetation will be cut to within 1" of the soil so they can get the geophysical equipment on site and that soil disturbance will be minimal. From talking with the folks, at this time there will not be any wide scale clearing. Once the test results are in, further testing/excavations maybe required which at that time we will consult with you on procedures. If you have any more questions, please let me know.
Thanks

Tommy

-----Original Message-----
From: Rail, Joseph P CIV NAVFAC Washington
Sent: Monday, November 02, 2009 3:45 PM
To: Wright, Thomas CIV NAVFAC Washington, Environmental
Cc: Carros, Nicholas T CIV NAVFAC Washington, Environmental
Subject: RE: 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites" -Archeological Site Information

Tommy, if I understand your question correctly, then yes, we can say that vegetation will be cleared with 1" of the stump remaining. Vegetation needs to be cleared in some areas so that we can do our geophysical surveys. And soil disturbance will be minimal.

-----Original Message-----
From: Carros, Nicholas T CIV NAVFAC Washington, Environmental
Sent: Monday, November 02, 2009 15:36
To: Rail, Joseph P CIV NAVFAC Washington
Subject: FW: 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites" -Archeological Site Information

Joe, do you mind fielding this?

Nicholas Carros
Phone:(301)744-2263
Fax: (301)744-6241
nicholas.carros@navy.mil

-----Original Message-----
From: Wright, Thomas CIV NAVFAC Washington, Environmental
Sent: Monday, November 02, 2009 15:33
To: Carros, Nicholas T CIV NAVFAC Washington, Environmental; 'IH_CWAP'
Cc: Humphreys, James K CIV NAVFAC Washington, Environmental Dept
Subject: RE: 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites" -Archeological Site Information

I have forwarded the information to Beth Cole and she is going to get back to me on the amount of info she needs. She is concerned about the soil disturbance. Can we safely say that the vegetation will be cleared with 1" of stump remaining? This might clarify issues for her.
Thanks
T
-----Original Message-----
From: Carros, Nicholas T CIV NAVFAC Washington, Environmental
Sent: Tuesday, October 20, 2009 1:39 PM
To: Wright, Thomas CIV NAVFAC Washington, Environmental; 'IH_CWAP'
Cc: Humphreys, James K CIV NAVFAC Washington, Environmental Dept
Subject: RE: 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites" -Archeological Site Information

Tommy & Dave,

I just spoke with the contractor and they confirmed that the vegetation clearance will be to the ground

surface only.

r/
Nick

Nicholas Carros
Phone:(301)744-2263
Fax: (301)744-4180
nicholas.carros@navy.mil

-----Original Message-----
From: Wright, Thomas CIV NAVFAC Washington, Environmental
Sent: Tuesday, October 20, 2009 8:39
To: 'IH_CWAP'; Carros, Nicholas T CIV NAVFAC Washington, Environmental
Cc: Humphreys, James K CIV NAVFAC Washington, Environmental Dept
Subject: RE: 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites" -Archeological Site Information

Dave, Nick

Do we have the sample points for the DPT at this time?
Will the veg removal be at the surface or will it include uprooting?\ How many samples will occur in those arch areas needing Phase II surveys?

Thanks
T

-----Original Message-----
From: IH_CWAP [mailto:IH_CWAP@erg.com]
Sent: Monday, October 19, 2009 3:55 PM
To: Wright, Thomas CIV NAVFAC Washington, Environmental
Cc: IH_CWAP
Subject: 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites" -Archeological Site Information

Tommy,

Per our phone conversation last week, I am forwarding you information about project 10-012 "Stump Neck: Soil Sampling at 10 MRP Sites". I have also attached a map showing the work locations of the three UXO sites that overlap archeological sites as well as a map from the UFP for work at UXO-26.

This project will involve sampling and inspection of ten UXO (Unexploded Ordnance) sites for munitions constituents (MC) and munitions and explosives of concern (MEC). Work at the three UXO sites that overlap archeological sites is described below.

UXO-12 "Torpedo Burial Site"
- Work will involve vegetation removal, UXO detector-aided sweeps, geophysical surveys, and soil sampling.
- Soil sampling will include collecting 20 subsurface samples at 10 locations (2 - 4 ft. and 4 - 6 ft. below ground surface (bgs)) via direct-push technology (DPT).
- Sampling will also include collecting two sediment samples (0 - 6 in. bgs) and one surface water sample from the drainage channel.
- This site overlaps archeological site 18CH388, which requires Phase II investigation.

UXO-26 "The Valley Impact Area"
- Work will involve vegetation removal and 400-ft spaced UXO detector-aided sweeps and geophysical surveys.
- Note - UXO-26 covers the entire Stump Neck Area (and other UXO sites) but work at this site will not involve any soil sampling (other than the soil sampling that is occurring at other UXO Sites within UXO-26).
-This site overlaps 18CH634, 18CH631, 18CH632, and 18CH645 which SHPO has determined are not eligible.
-This site also overlaps 18CH390, 18CH623, and 18CH625, which require Phase II investigation.

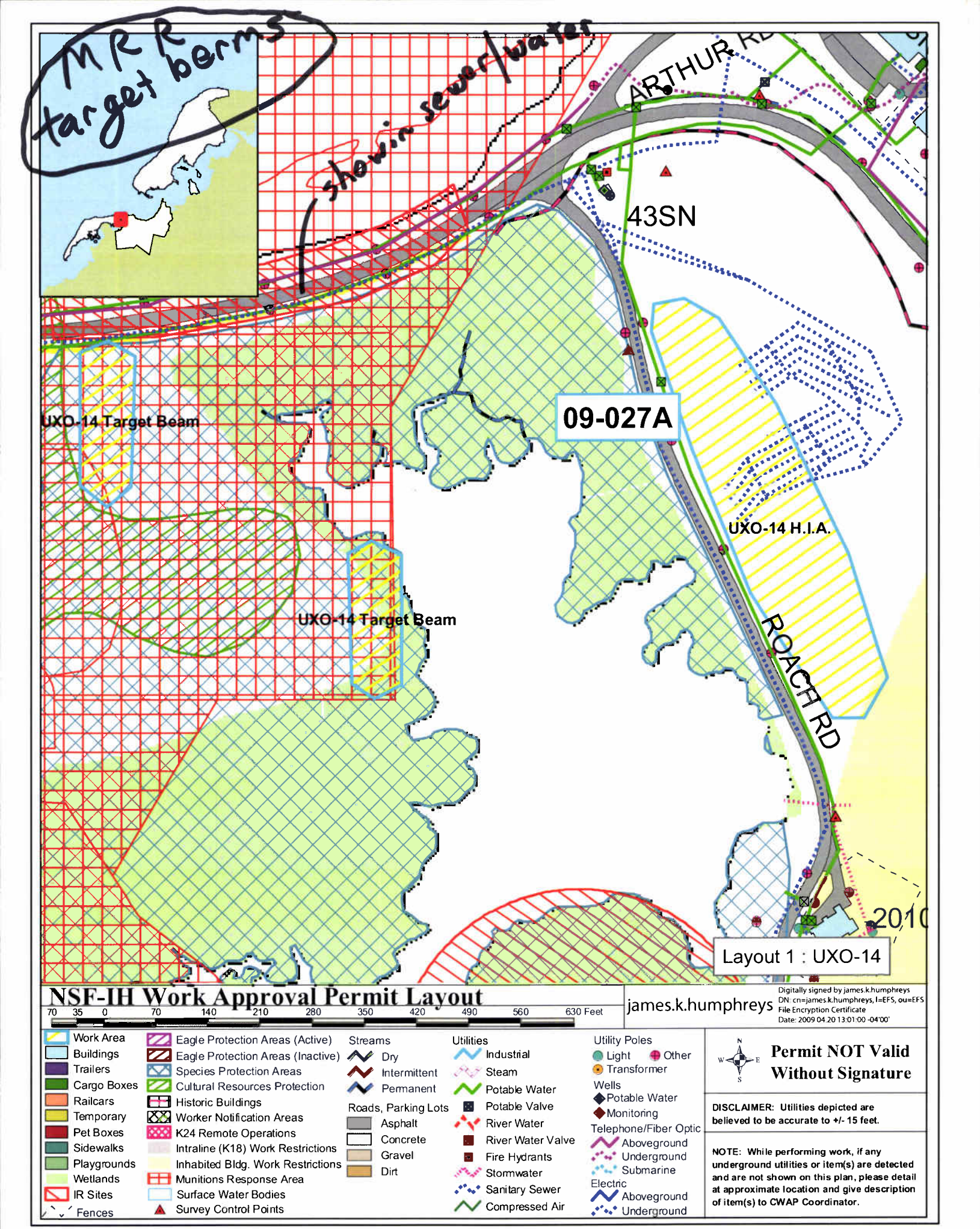
UXO-28 "EOD School Demolition Area"
- Work will involve vegetation removal, UXO detector-aided sweeps, geophysical surveys, and soil sampling.
- Soil sampling will include collecting 40 surface samples at 20 locations (0-6 and 0-24 in. bgs) via hand auger.
- Overlaps 18CH388, which requires Phase II investigation.

Please let me know if you need any additional information from me.

Thanks,
Dave

CWAP Team
ERG
14555 Avion Parkway, Suite 200
Chantilly, VA 20151
IH_CWAP@erg.com

At ERG: (703) 633-1600
At Indian Head: (301) 744-2158
Fax: (301) 744-4942


MRR target berms
shown sewer/water
ARTHUR RD
43SN
09-027A
UXO-14 Target Beam
UXO-14 H.I.A.
UXO-14 Target Beam
ROACH RD
Layout 1 : UXO-14
NSF-IH Work Approval Permit Layout
70 35 0 70 140 210 280 350 420 490 560 630 Feet
james.k.humphreys
Digitally signed by james.k.humphreys
DN: cn=james.k.humphreys, l=EFS, ou=EFS
File Encryption Certificate
Date: 2009 04 20 13:01:00 -04'00'
Work Area
Buildings
Trailers
Cargo Boxes
Railcars
Temporary
Pet Boxes
Sidewalks
Playgrounds
Wetlands
IR Sites
Fences
Eagle Protection Areas (Active)
Eagle Protection Areas (Inactive)
Species Protection Areas
Cultural Resources Protection
Historic Buildings
Worker Notification Areas
K24 Remote Operations
Intraline (K18) Work Restrictions
Inhabited Bldg. Work Restrictions
Munitions Response Area
Surface Water Bodies
Survey Control Points
Streams
Dry
Intermittent
Permanent
Roads, Parking Lots
Asphalt
Concrete
Gravel
Dirt
Utilities
Industrial
Steam
Potable Water
Potable Valve
River Water
River Water Valve
Fire Hydrants
Stormwater
Sanitary Sewer
Compressed Air
Utility Poles
Light
Other
Transformer
Wells
Potable Water
Monitoring
Telephone/Fiber Optic
Aboveground
Underground
Submarine
Electric
Aboveground
Underground
N
W
E
S
Permit NOT Valid Without Signature
DISCLAIMER: Utilities depicted are believed to be accurate to +/- 15 feet.
NOTE: While performing work, if any underground utilities or item(s) are detected and are not shown on this plan, please detail at approximate location and give description of item(s) to CWAP Coordinator.

P:/GIS/INDIANHEAD_NSWC_NEW/MAPDOCS/MXD/SN_OLD_SKEET_TRAP_RANGE.MXD 4/07/09 SS

1248500 1249000 1249500

324000

323500

River

Maximum Shot Distance

N

Legend

- Sediment Sample Location
- Soil Sample Location
- Former Trap House Location
- MRP Area Identified during PA
- Installation Boundary
- Soil/Sediment Sample Locations - Land
- Soil/Sediment Sample Locations - Water
- Firing Direction

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

pad lights? utilities along road?

utilities related to launcher? utilities here

former structure

125 62.5 0 125 Feet

DRAWN BY K. MOORE	DATE 8/24/07
CHECKED BY M. BLANKEN	DATE 4/07/09
COST/SCHEDULE-APEA	
SCALE AS NOTED	

NAVFAC

OLD SKEET AND TRAP RANGE
SOIL/SEDIMENT SAMPLE LOCATIONS
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO.	MAP 17.2
REV	0

SECTION 2

DAILY QUALITY CONTROL REPORTS

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 01	Location: Stump Neck Annex	Date: 15-Nov-09

Phase	List Definable Features of Work, Locations, and List of personnel present: Mobilization; Craig Irland, Scott Roberts, Tom Yancey
Preparatory	-Obtained security badges for access to Stump Neck Annex -Located work sites and reviewed SAP Worksheets for each site -Reviewed requirements for and procured necessary field supplies

Initial		Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

First look at project site for SUXOS and SSO/QC with UXP PM

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 15-Nov-09

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 02	Location: Stump Neck Annex	Date: 16-Nov-09

Phase	List definable Features of Work, Locations, and List Personnel Present: Mobilization completion/1st work day; Craig Irland, Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Lee Allen, Trish Lemke
Preparatory	-Reviewed HASP and Work Plan -Familiarization with Trimble XLT GPS files for project sites -Received delivery of skid steer brush hog and portable toilet -Set boundary stakes for 100% mag survey of EODS Demo Area and Advanced IED Area, and began vegetation management.

Initial		Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 16-Nov-09

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 03	Location: Stump Neck Annex	Date: 17-Nov-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Craig Irland, Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Lee Allen, Trish Lemke	
Preparatory	-Vegetation Management, EODS Demo Area, Scott Roberts attending. -Detector-Aided Surfaces Sweep, Frank Montes, Trish Lemke attending.	
Initial	-Vegetation Management- Mechanized, Advanced IED Area, Mark Soha attending.	Inspection Performed Observed skid steer mower in operation.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

Vegetation Management-Mechanized, Advanced IED Area performed iaw HASP and Work Plan. Safety Observer in position, area inspected for surface hazards prior to commencing ops.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 17-Nov-09

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 05	Location: Stump Neck Annex	Date: 19-Nov-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Craig Irland, Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Lee Allen, Trish Lemke
Preparatory	-Mobilization/Site Preparation: Vegetation Management using metal bladed weed eater and chainsaw in Torpedo all team members. -Surface Removal of Non-Munitions Related Debris: Light material to be moved out of work area, movable material dragged away from transects, embedded heavy items left in place. -Mobilization/Site Preparation: Equipment setup and checkout attended by all team members. Instructed team in using spill controls when fueling gas powered equipment.

Initial	-Vegetation Management	Inspection Performed Observed brush removal by machete, chainsaw, and metal bladed weed eater.
Follow up	Detector-Aided Surface Sweep	Inspection Performed Performed QC inspection on 50% of EODS Demo Area (100% Coverage Area)

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Tom Yancey
Project Quality Control Officer Date 18-Nov-09

Client Quality Assurance

_____ _____
Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 05	Location: Stump Neck Annex	Date: 19-Nov-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Craig Irland, Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Lee Allen, Trish Lemke	
Preparatory	-Mobilization/Site Preparation: Vegetation Management using metal bladed weed eaters and chainsaw in Torpedo Burial Area attended by all team members. equipment.	
Initial	-Vegetation Management in EODS Demo Area	Inspection Performed Observed brush removal by machete, chainsaw, and metal bladed weed eater.
Follow up	-Vegetation Management in EODS Demo Area	Inspection Performed Observed cut brush dispersal and staging out of grid boundaries.

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 19-Nov-09

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 06	Location: Stump Neck Annex	Date: 20-Nov-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Lee Allen, Trish Lemke	
Preparatory	-Mobilization/Site Preparation: Vegetation Management using metal bladed weed eaters and chainsaw in Advanced IED Area.	
Initial	-Vegetation Management in Advanced IED Area	Inspection Performed Observed brush removal by machete, chainsaw, and metal bladed weed eater.
Follow up	-Grid Survey and Layout, Air Blast Pond Area	Inspection Performed Observed GPS checkout, boundary and transect stake installation.

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 20-Nov-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 07	Location: Stump Neck Annex	Date: 21-Nov-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Lee Allen, Trish Lempke.	
Preparatory	Detector-Aided Surface Sweep in Torpedo Burial Site was monitored from five foot search lane layout to performance of sweep, and investigation to determine if an anomaly is sub-surface or surface. All procedures were IAW the Workplan and Hasp.	
Initial		Inspection Performed
Follow up	-Vegetation Management in Advanced IED Area	Inspection Performed Observed chainsaw and brush cutting procedures, which were IAW with the work plan and Hasp.

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Tom Yancey
Project Quality Control Officer Date 21-Nov-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 08	Location: Stump Neck Annex	Date: 22-Nov-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Lee Allen, Trish Lempke.	
Preparatory	Detector-Aided Surface Sweep in Torpedo Burial Site using the White all metal detector was monitored for procedural accuracy. All procedures were IAW the Workplan and Hasp.	
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep using White all-metal detector in EODS Demo Area (100%).	Inspection Performed Performed QC Insp on 30% of EODS Demo Area (100% Area). No uninvestigated anomalies found .

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Tom Yancey
Project Quality Control Officer Date 22-Nov-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 09	Location: Stump Neck Annex	Date: 23-Nov-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Lee Allen, Trish Lempke.	
Preparatory	Detector-Aided Surface Sweep in Torpedo Burial Site (continued from yesterday) using the White all metal detector was monitored for procedural accuracy. All procedures were IAW the Workplan and Hasp.	
Initial	Site Preparation – Grid Survey and Layout	Inspection Performed Observed location of transects with GPS and transect marking stakes emplaced.
Follow up	Detector-Aided Surface Sweep- using White all-metal detector in Torpedo Burial Site (100%).	Inspection Performed Performed QC Insp on 30% of Torpedo Burial Site (100% Area). No uninvestigated anomalies found .

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

Tom Yancey
Project Quality Control Officer Date 23-Nov-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 11	Location: Stump Neck Annex	Date: 30-Nov-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke.	
Preparatory	Site Preparation: Grid Survey and Layout—Marking transects in Torpedo Casing Disposal Area.	
Initial		Inspection Performed
Follow up	Site Preparation: Vegetation Management –Continuation of brush cutting transects in Advanced IED Area. Grid Survey and Layout –Advanced IED Area.	Inspection Performed Observed brush removal and transect staking operations. Walked all transects, inspected layout & direction. All IAW work plan.

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 30-Nov-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 12	Location: Stump Neck Annex	Date: 01-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Craig Irland, Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke, Jim Coffman.	
Preparatory	Mobilization: Installation of ITS: Serialized, photographed, and buried seed items.	
Initial		Inspection Performed
Follow up		Inspection Performed Observed equipment function check, EM 61 survey of planned ITS plot, and first run on ITS with EM 61 and G-858. All IAW work plan.

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 01-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 13	Location: Stump Neck Annex	Date: 02-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Craig Irland, Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke, Jim Coffman.	
Preparatory	Detector-Aided Surface Sweep: Recorded Location and Photographed MEC and MD items in Advanced IED Area in the immediate vicinity of SWMU 27.	
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep	Inspection Performed: QC Inspection on two transects in Advanced IED Area. Transect 11 failed QC inspection.

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today
Transect 11 failed QC Inspection: Two uninvestigated MD items found.	

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 02-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 14	Location: Stump Neck Annex	Date: 03-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Craig Irland, Scott Roberts, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke, Jim Coffman.	
Preparatory		
Initial	Geophysical Survey	Inspection Performed Observed Equipment Function Check.
Follow up	Detector-Aided Surface Sweep: Recorded location and photographed 10 MD and 3 MEC items.	Inspection Performed QC Inspection of Transects 19 and 16 in Advanced IED Area. No discrepancies found.

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today
	Transect 11 in the Advanced IED Ares was re-swept and MD items marked for photos and GPS location.

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 03-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 17	Location: Stump Neck Annex	Date: 06-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke, Jim Coffman.	
Preparatory	Stake and mark transects in the Valley Impact Area.	
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep.	Inspection Performed QC Inspection 100% of transects 10, 12 and 14and 15% of the 100% area of the Advanced IED Area. Transect 10 failed due to ordnance.

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today: None
Transects 10 and 11 need to be redone	

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 06-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 18	Location: Stump Neck Annex	Date: 07-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke, Jim Coffman.	
Preparatory	Cut 3 transects in Stump Neck Impact Area, Lay out transects in Torpedo Casing Area.	
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep.	Inspection Performed QC Inspection 100% of transects 10 and 11.

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today: None
	Transects 10 and 11 swept

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 07-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 18	Location: Stump Neck Annex	Date: 08-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke, Jim Coffman, Sean, Huber (Navy EOD), Rory Kennedy (Navy EOD)	
Preparatory	Lay out and cut transects in Area 8 and Stump Neck Impact Area.	
Initial		Inspection Performed
Follow up	Inspection of SUXO reports	Inspection Performed QC Inspection of SUSXO reports, no discrepancies noted

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 08-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 18	Location: Stump Neck Annex	Date: 08-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke, Jim Coffman, Sean, Huber (Navy EOD), Rory Kennedy (Navy EOD)	
Preparatory	Lay out and cut transects in Area 8 and Stump Neck Impact Area.	
Initial		Inspection Performed
Follow up	Inspection of SUXO reports	Inspection Performed QC Inspection of SUSXO reports, no discrepancies noted

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 08-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 19	Location: Stump Neck Annex	Date: 09-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke, Jim Coffman, Sean, Huber (Navy EOD), Rory Kennedy (Navy EOD)
Preparatory	Observed laying out and cutting of transect lines in torpedo casing disposal area. Observed cutting of transect lines in Stump Neck Impact area. No dificiencies noted.

Initial		Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 09-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 19	Location: Stump Neck Annex	Date: 09-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke, Jim Coffman, Sean, Huber (Navy EOD), Rory Kennedy (Navy EOD)
Preparatory	Observed laying out and cutting of transect lines in torpedo casing disposal area. Observed cutting of transect lines in Stump Neck Impact area. No dificiencies noted.

Initial		Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 09-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 20	Location: Stump Neck Annex	Date: 14-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke,	
Preparatory	Observed laying out and cutting of transect lines in torpedo casing disposal area. Observed cutting of transect lines in Stump Neck Impact area. No dificiencies noted.	
Initial	Surface sweep of the torpedo casing disposal area using schonstedts	Inspection Performed QCd transects 1,2 5, 7, 10, 13 and 16. No deficiencies noted
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 14-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 20	Location: Stump Neck Annex	Date: 14-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke,	
Preparatory	Observed laying out and cutting of transect lines in torpedo casing disposal area. Observed cutting of transect lines in Stump Neck Impact area. No dificiencies noted.	
Initial	Surface sweep of the torpedo casing disposal area using schonstedts	Inspection Performed QCd transects 1,2 5, 7, 10, 13 and 16. No deficiencies noted
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 14-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 21	Location: Stump Neck Annex	Date: 15-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke,	
Preparatory	Observed cutting of transects 23 thru 30 in Stump Neck Impact area. Transects 1 and 31 are inaccessible by foot. Observed team setting steaks for transects 14 thru 19 in the Valley Impact Area. While leaving the Stump Neck Impact area, the team locate some Japanese type 3 Mine parts, all parts were empty and are munitions debris No deficiencies noted.	
Initial	Transects 13 thru 22 were swept with schonstedts.	Inspection Performed QCd transects 15, 17, 20 and 21. No deficiencies noted
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 15-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 21	Location: Stump Neck Annex	Date: 15-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke,	
Preparatory	Observed cutting of transects 23 thru 30 in Stump Neck Impact area. Transects 1 and 31 are inaccessible by foot. Observed team setting steaks for transects 14 thru 19 in the Valley Impact Area. While leaving the Stump Neck Impact area, the team locate some Japanese type 3 Mine parts, all parts were empty and are munitions debris No deficiencies noted.	
Initial	Transects 13 thru 22 were swept with schonstedts.	Inspection Performed QCd transects 15, 17, 20 and 21. No deficiencies noted
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 15-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 22	Location: Stump Neck Annex	Date: 16-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke,	
Preparatory	Observed cutting of transects 18 & 19 in Valley Impact Area. Observed flagging of transects 14 thru 19 in Valley Impact Area No Deficiencies Noted	
Initial	Transects 23 thru 30 were swept with schonstedts.	Inspection Performed QCd transects 3, 6 and 10 No deficiencies noted
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 16-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 22	Location: Stump Neck Annex	Date: 16-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke,	
Preparatory	Observed cutting of transects 18 & 19 in Valley Impact Area. Observed flagging of transects 14 thru 19 in Valley Impact Area No Deficiencies Noted	
Initial	Transects 23 thru 30 were swept with schonstedts.	Inspection Performed QCd transects 3, 6 and 10 No deficiencies noted
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 16-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 23	Location: Stump Neck Annex	Date: 17-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke,	
Preparatory	Observed cutting of transects 15, 16 and 17 in Valley Impact Area. No Deficiencies Noted	
Initial	Boat operations magnetometer check of pond in area 8.	Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 17-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 24	Location: Stump Neck Annex	Date: 18-Dec-09

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Glen Childers, Tom Yancey, Mark Soha, Frank Montes, Trish Lemke,	
Preparatory	Observed cutting of transect 14 in the Valley Impact Area. No Deficiencies Noted	
Initial	Observed Boat operations magnetometer check of Chicamuxen Creek in area 8. No discrepancies noted. Observed magnetometer sweep of transects 14 thru 19 in the Valley Impact Area. No discrepancies noted.	Inspection Performed QC Check of equipment check out procedures and forms. No Discrepancies noted.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Glen Childers Project Quality Control Officer Date 18-Dec-09

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 25	Location: Stump Neck Annex	Date: 04 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith	
Preparatory	Site Preparation: Vegetation Management – Chainsaw safety and instruction given to Alfred Smith prior to work at Air Blast Pond site.	
Initial		Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date; 04 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 25	Location: Stump Neck Annex	Date: 04 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith
Preparatory	Site Preparation: Vegetation Management – Chainsaw safety and instruction given to Alfred Smith prior to work at Air Blast Pond site.

Initial		Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date: 04 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 26	Location: Stump Neck Annex	Date: 05 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith, Craig Irland, Jim Coffman.	
Preparatory	Site Preparation: Grid Survey and Layout – Area 8, monitored reacquisition and marking of 17 points denoting air shot and water shot locations in preparation for the detector-aided surface sweep.	
Initial	Detector-Aided Surface Sweep: Record Location (GPS and Photograph – Valley Impact Area, Transects 19/18 and Transect 14 recorded data and photographed 5 MD items, 2 MEC items.	Inspection Performed Observed data recording using Trimble XLT. All steps performed IAW workplan.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 05 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 26	Location: Stump Neck Annex	Date: 05 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith, Craig Irland, Jim Coffman.	
Preparatory	Site Preparation: Grid Survey and Layout – Area 8, monitored reacquisition and marking of 17 points denoting air shot and water shot locations in preparation for the detector-aided surface sweep.	
Initial	Detector-Aided Surface Sweep: Record Location (GPS and Photograph – Valley Impact Area, Transects 19/18 and Transect 14 recorded data and photographed 5 MD items, 2 MEC items.	Inspection Performed Observed data recording using Trimble XLT. All steps performed IAW workplan.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 05 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 27	Location: Stump Neck Annex	Date: 06 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith, Jim Coffman.	
Preparatory	Site Preparation: Grid Survey and Layout – Area 8, monitored the marking of 4 groupings encompassing 39 points denoting air shot and water shot locations in preparation for the detector-aided surface sweep.	
Initial	Geophysical Survey: Geophysical Survey of Stump Neck Impact Area, Transects 2 – 18.	Inspection Performed Observed equipment set-up and data collection on T2-T18. All steps performed IAW work plan.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 06 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 27	Location: Stump Neck Annex	Date: 06 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith, Jim Coffman.	
Preparatory	Site Preparation: Grid Survey and Layout – Area 8, monitored the marking of 4 groupings encompassing 39 points denoting air shot and water shot locations in preparation for the detector-aided surface sweep.	
Initial	Geophysical Survey: Geophysical Survey of Stump Neck Impact Area, Transects 2 – 18.	Inspection Performed Observed equipment set-up and data collection on T2-T18. All steps performed IAW work plan.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 06 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 28	Location: Stump Neck Annex	Date: 07 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith, Jim Coffman.	
Preparatory	Site Preparation: Grid Survey and Layout – Area 8, Continued monitoring the marking of groups of air shot and water shot locations in preparation for the detector-aided surface sweep.	
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Vegetation Management: Valley Impact Area Transects 14,15 wetlands portion.	Inspection Performed 100% QC of wetlands portion of V IA T14, T15. No discrepancies noted. All brush cutting performed IAW work plan and HASP.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 07 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 28	Location: Stump Neck Annex	Date: 07 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith, Jim Coffman.	
Preparatory	Site Preparation: Grid Survey and Layout – Area 8, Continued monitoring the marking of groups of air shot and water shot locations in preparation for the detector-aided surface sweep.	
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Vegetation Management: Valley Impact Area Transects 14,15 wetlands portion.	Inspection Performed 100% QC of wetlands portion of V IA T14, T15. No discrepancies noted. All brush cutting performed IAW work plan and HASP.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 07 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 28	Location: Stump Neck Annex	Date: 08 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith, Jim Coffman.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Vegetation Management: Valley Impact Area Transects T1-T6, T8-T10	Inspection Performed 100% QC of VIA T1-T6, T8-T10. No discrepancies noted. All brush cutting performed IAW work plan and HASP.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 08 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 28	Location: Stump Neck Annex	Date: 08 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith, Jim Coffman.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Vegetation Management: Valley Impact Area Transects T1-T6, T8-T10	Inspection Performed 100% QC of VIA T1-T6, T8-T10. No discrepancies noted. All brush cutting performed IAW work plan and HASP.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 08 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 29	Location: Stump Neck Annex	Date: 09 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith, Jim Coffman.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Vegetation Management: Valley Impact Area Transects T7, T11-T13	Inspection Performed 100% QC of VIA T7, T11-T13. No discrepancies noted. All brush cutting performed IAW work plan and HASP.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 09 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 30	Location: Stump Neck Annex	Date: 10 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith.	
Preparatory		
Initial	Detector-Aided Surface Sweep, Area 8	Inspection Performed Monitored sweep techniques on difficult terrain. Detector-Aided Surface Sweeps performed efficiently and safely.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 10 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 30	Location: Stump Neck Annex	Date: 10 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith.	
Preparatory		
Initial	Detector-Aided Surface Sweep-Area 8	Inspection Performed Observed sweep techniques on rough terrain. All procedures were IAW the work plan and HASP.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 10 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 31	Location: Stump Neck Annex	Date: 11 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith.	
Preparatory		
Initial		Inspection Performed
Follow up	Vegetation Management: Brush cutting at Air Blast Pond Site	Inspection Performed Monitored brush cutting procedures, proper equipment usage, and safety observers' performance. All Vegetation Management activities were IAW the work plan and HASP.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 11 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 31	Location: Stump Neck Annex	Date: 11 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith.	
Preparatory		
Initial		Inspection Performed
Follow up	Vegetation Management: Brush cutting at Air Blast Pond Site	Inspection Performed Monitored brush cutting procedures, proper equipment usage, and safety observers' performance. All Vegetation Management activities were IAW the work plan and HASP.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 11 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 32	Location: Stump Neck Annex	Date: 12 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith.	
Preparatory		
Initial	Vegetation Management: Brush cutting at Basic IED Area	Inspection Performed Monitored brush cutting procedures, proper equipment usage, and safety observer's performance. All Vegetation Management activities were IAW the work plan and HASP.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 12 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 33	Location: Stump Neck Annex	Date: 13 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith.	
Preparatory		
Initial	Detector-Aided Surface Sweep, Area 8	Inspection Performed Closely monitored sweep techniques of both Tech I personnel. Both are doing well and are starting to pick up speed in the grid.
Follow up	Vegetation Management, Air Blast Pond Area	Inspection Performed Final QC check on Vegetation Management in the Air Blast Pond area. Site is ready for surface sweep.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 13 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 34	Location: Stump Neck Annex	Date: 13 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith.	
Preparatory		
Initial	Detector-Aided Surface Sweep, Area 8	Inspection Performed Closely monitored sweep techniques of both Tech I personnel. Both are doing well and are starting to pick up speed in the grid.
Follow up	Vegetation Management, Air Blast Pond Area	Inspection Performed Final QC check on Vegetation Management in the Air Blast Pond area. Site is ready for surface sweep.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 13 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 34	Location: Stump Neck Annex	Date: 18 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith.	
Preparatory		
Initial	Detector-Aided Surface Sweep, Area 8	Inspection Performed Performed 100% QC of areas 9, 5, and 4. All areas passed with no discrepancies noted.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 18 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 35	Location: Stump Neck Annex	Date: 19 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Air Blast Pond	Inspection Performed Performed QC inspection on 40% of area in Air Blast pond Site. No uninvestigated anomalies found.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 19 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 36	Location: Stump Neck Annex	Date: 20 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Area 8 Detector-Aided Surface Sweep, Air Blast Pond	Inspection Performed Performed QC inspection on 100% of Groupings 13, 14, and 1 in Area 8. No uninvestigated anomalies found. Monitored sweep techniques of an all Tech I sweep team under the supervision of the SUXOS. No discrepancies noted.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 20 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 37	Location: Stump Neck Annex	Date: 21 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Area 8 Detector-Aided Surface Sweep, Basic IED Area	Inspection Performed Performed QC inspection on 100% of Groupings 10 and 11 in Area 8. No uninvestigated anomalies found. Performed photo documentation during location recording of MD in BIEDA transects.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 21 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 38	Location: Stump Neck Annex	Date: 22 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Air Blast Pond	Inspection Performed Performed QC inspection on 20% of the Air Blast Pond site for a total of 60% QC of the total area. No uninvestigated anomalies found.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 22 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 39	Location: Stump Neck Annex	Date: 23 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Air Blast Pond Detector-Aided Surface Sweep, Area 8	Inspection Performed Performed QC inspection on an additional 15% of the Air Blast Pond site for a total of 75% QC of the total area. No uninvestigated anomalies found. Monitored surface sweep procedures and anomaly location documentation.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 23 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 39	Location: Stump Neck Annex	Date: 23 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Air Blast Pond Detector-Aided Surface Sweep, Area 8	Inspection Performed Performed QC inspection on an additional 15% of the Air Blast Pond site for a total of 75% QC of the total area. No uninvestigated anomalies found. Monitored surface sweep procedures and anomaly location documentation.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 23 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 40	Location: Stump Neck Annex	Date: 24 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Mark Soha, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Area 8	Inspection Performed Completed QC check of Area 8, performing surface sweep over 50% of total area using a White's all metal detector. No uninvestigated anomalies were found.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 24 Jan 10

Client Quality Assurance

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Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 41	Location: Stump Neck Annex	Date: 25 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Basic IED Area	Inspection Performed Completed QC checks on 100 % of all Transects in the Basic IED Area No uninvestigated anomalies were found.
	Detector-Aided Surface Sweep, Air Blast Pond	Final QC check on Air Blast Pond . 85% of total area was checked and no uninvestigated anomalies were found.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 25 Jan 10

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 42	Location: Stump Neck Annex	Date: 26 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Basic IED Area	Inspection Performed Monitored surface sweep techniques, anomaly investigation, grid layout, and accuracy of anomaly identification in the 100% area of the Basic IED Area.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 26 Jan 10

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 43	Location: Stump Neck Annex	Date: 27 Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Trish Lemke, Alfred Smith, Terry Rojahn, Jacob Birkett.	
Preparatory		
Initial	Vegetation Management, Test Site One	Inspection Performed Monitored brush cutting in the over grown areas of Test Site One. No discrepancies noted.
Follow up	Detector-Aided Surface Sweep, Basic IED Area	Inspection Performed Performed 100% QC check of the Basic IED Area 100% portion. No uninvestigated anomalies were found. This completes the final QC of the Basic IED Area

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 27 Jan 10

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 46	Location: Stump Neck Annex	Date: 02 Feb 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Mark Soha, Trish Lemke, Alfred Smith, Fred Ramser, Jacob Birkett, Terry Rojahn.	
Preparatory		
Initial	Detector-Aided Surface Sweep, Test Site One	Inspection Performed Monitored the use of GA-52 CXs and White Spectrum XLT in the surface sweep of Test Site One. All sweep procedures were IAW the work plan and Hasp.
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 02 Feb 10

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 47	Location: Stump Neck Annex	Date: 03 Feb 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Mark Soha, Trish Lemke, Alfred Smith, Fred Ramser, Jacob Birkett, Terry Rojahn.	
Preparatory		
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Test Site One	Inspection Performed Final QC check on the last 30% of the area swept in Test Site One. No uninvestigated anomalies found.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 03 Feb 10

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 48	Location: Stump Neck Annex	Date: 04 Feb 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Mark Soha, Trish Lemke, Alfred Smith, Fred Ramser, Jacob Birkett, Terry Rojahn.	
Preparatory		
Initial	Demobilization: Remove ITS	Inspection Performed Monitored removal of ITS and restoration of the site.
Follow up	Demobilization: Remove Temporary Survey Markers	Inspection Performed Monitored removal of stakes and pin flags in Area 8.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 04 Feb 10

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 49	Location: Stump Neck Annex	Date: 08 Feb 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Trish Lemke, Alfred Smith.	
Preparatory		
Initial		Inspection Performed
Follow up	Demobilization: Remove Temporary Survey Markers	Inspection Performed Monitored removal of stakes and pin flags in Valley Impact Area T14-T19 and northern boundary of AIEDA.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 08 Feb 10

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 1	Location: Stump Neck / ITS (Test Area 2)	Date: 12/1/09

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box and QC checks)	
Initial	Instrument Test Strip – Test Area 2 – Jim Coffman (Project Geophysicist), Craig Irland (UXO Team Supervisor), Tom Yancey (UXO Technician / Safety Officer)	Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

GPS accuracy check (two monuments), Static Background and Spike Test, WS #22 tests. Background geophysical survey of ITS area with EM61-MK2 (integrated GPS) and G-858G (integrated GPS). Seeded ITS survey with G-858G.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

_____ _____
Project Quality Control Officer Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____
Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 2	Location: Stump Neck / ITS (Test Area 2)	Date: 12/2/09

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box and QC checks)	
Initial	Instrument Test Strip – Test Area 2 – Jim Coffman (Project Geophysicist), Craig Irland (UXO Team Supervisor), Tom Yancey (UXO Technician / Safety Officer)	Inspection Performed
Follow up		Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

GPS accuracy check (two monuments), Static Background and Spike Test, WS #22 tests. Geophysical survey of seeded ITS area with EM61-MK2 (integrated GPS). Data processing and reporting ITS results.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

_____ _____
Project Quality Control Officer Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____
Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 3	Location: Stump Neck / EOD School Demo Site	Date: 12/3/09

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box and QC checks)	
Initial	Equipment Function Test (EFT) - Pass	Inspection Performed
Follow up	Geophysical survey (5ft line spaced) using EM61-MK2 and G-858G with integrated DGPS over the 100 ft by 200 ft grid around the bunker.	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

GPS accuracy check (two monuments), Static Background and Spike Test, WS #22 tests. Geophysical survey delayed approximately an hour and a half because of weak satellite reception.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

_____ _____
Project Quality Control Officer Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____
Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 4	Location: Stump Neck / EOD School Demo Site	Date: 12/4/09

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box and QC checks)	
Initial	Equipment Function Test (EFT) - Pass	Inspection Performed
Follow up	Geophysical survey (5ft line spaced) using G-858G with integrated DGPS over the add-on area which was based on the MD discovered near the east end of the survey area (specified by UXO Team). Geophysical survey using G-858G with integrated DGPS on the 50-ft spaced planned transects.	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

GPS accuracy check (two monuments), Static Background and Spike Test, WS #22 tests. Geophysical survey delayed approximately an hour and a half in the morning because of weak satellite reception.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	_____ Project Quality Control Officer	_____ Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ Client QA Representative

_____ Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 5	Location: Stump Neck / EOD School Demo Site	Date: 12/5/09

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box and GPS QC checks)	
Initial		Inspection Performed
Follow up	DGPS survey of surface metal (non-munitions related) in EOD School Demo survey area to tie-in these locations and document in the reporting.	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

Field day shortened (12PM) due to rain/snow/weather conditions.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

_____ _____
Project Quality Control Officer Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____
Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 6	Location: Stump Neck / Torpedo Burial Site / EOD School Demo Site	Date: 12/6/09

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box and GPS QC checks)	
Initial	EFT (pass)	Inspection Performed
Follow up	G-858G survey of Torpedo Burial Site (5-ft spaced survey lines), DGPS survey of surface metal (non-munitions related) in Torpedo Burial survey area to tie-in these locations and document in the reporting. G-858G re-survey of 100 ft by 200 ft grid in EOD School Demo Site to try and improve GPS positioning accuracy	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today
	Re-survey of G-858G survey of 100 ft by 200 ft grid in EOD School Demo Site to try and improve GPS positioning accuracy.

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	_____ Project Quality Control Officer _____ Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ Client QA Representative _____ Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 7	Location: EOD School Demo Site	Date: 12/7/09

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box, Static Background and Spike, and GPS QC checks) Set up geophysical grid marks in Advanced IED Site	
Initial	EFT (pass)	Inspection Performed
Follow up	EM61 re-survey of 100 ft by 200 ft grid in EOD School Demo Site to try and improve GPS positioning accuracy	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today
	Re-survey of EM61 survey of 100 ft by 200 ft grid in EOD School Demo Site to try and improve GPS positioning accuracy.

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	_____ Project Quality Control Officer _____ Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ Client QA Representative _____ Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 8	Location: Advanced IED Site	Date: 12/8/09

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box, Static Background and Spike, and GPS QC checks)	
Initial	EFT with EM61 (pass)	Inspection Performed
Follow up	EM61 survey of 60 ft of grid in Advanced IED Site before EOD unit from Dahlgren arrives to inspect suspect MEC items detected by UXO Team. Inspection yielded need to take in place action on two items (site access terminated for geophysical today at 10:30AM based on EOD activity).	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

Shortened field day (ended approximately 10:30A) due to EOD unit's arrival to inspect suspect MEC

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

_____ _____
Project Quality Control Officer Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____
Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 9	Location: Advanced IED Site	Date: 12/9/09

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box, Static Background and Spike, and GPS QC checks)	
Initial	EFT with EM61 (pass)	Inspection Performed
Follow up	EM61 survey continuation and completion of survey grid in clear area of Advanced IED site. Process data in-field to check it prior to breaking down equipment and sending all geophysical equipment back to vendor (end of this 10 day shift).	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

All geophysical equipment packed and shipped back to vendor on demobilization from Site.

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

_____ _____
Project Quality Control Officer Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____
Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 10	Location: Stump Neck Impact Area	Date: 1/5/10

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box, Static Background and Spike, and GPS QC checks)	
Initial	ITS verification with G-858G (pass)	Inspection Performed
Follow up	G-858G survey of transects 12-10 in Stump Neck Impact Area. Process data for QC review.	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	_____ Project Quality Control Officer _____ Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ Client QA Representative _____ Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 11	Location: Stump Neck Impact Area	Date: 1/6/10

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box, Static Background and Spike, and GPS QC checks)	
Initial	EFT with G-858G (pass)	Inspection Performed
Follow up	G-858G survey of transects 30 through13, and 9 through 2 in Stump Neck Impact Area. Process data for QC review. Initial survey complete in Stump Neck Impact Area. Data processed for QC review.	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	_____ Project Quality Control Officer _____ Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ Client QA Representative _____ Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 12	Location: Torpedo Casing Disposal Area / Valley Impact Area	Date: 1/7/10

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box, Static Background and Spike, and GPS QC checks)	
Initial	EFT with G-858G (pass)	Inspection Performed
Follow up	G-858G survey of Torpedo Casing Disposal Area (initial survey complete). View data for QC review. Survey Transects 19, 18, 16 in Valley Impact Area.	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

_____ _____
Project Quality Control Officer Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____
Client QA Representative Date

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	Project: 112G00810 – SI – 10 MEC sites	
Report Number: 13	Location: Valley Impact Area	Date: 1/8/10

Phase	List Definable Features of Work, Locations, and List Personnel Present	
Preparatory	Set up geophysical equipment (Out of Box, Static Background and Spike, and GPS QC checks)	
Initial	EFT with G-858G (pass)	Inspection Performed
Follow up	G-858G survey of survey Transects 17, 15, 14, 16 (wetlands), 1, 2, 3 in Valley Impact Area.	Inspection Performed

Rework Items Identified Today (Not Corrected by Close of Business)	Rework Items Corrected Today

Remarks

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.

_____ _____
Project Quality Control Officer Date

Client Quality Assurance

Quality Assurance Representative Remarks and/or Exceptions to the Report

_____ _____
Client QA Representative Date

SECTION 3

SAFETY DAILY LOGS

TETRA TECH NUS, INC.

DATE	15-Nov- 09
NO.	01
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

--Daily Safety Brief.

--Obtained security badges for Stump Neck Annex

--Walked over project sites and reviewed work requirements at each.

_Reviewed requirements for and procured field supplies.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Sunny, mid 60s, calm.	

PERSONNEL ON SITE: Craig Irland, Scott Roberts, Tom Yancey

SIGNATURE: Tom Yancey DATE: 15-Nov-09

TETRA TECH NUS, INC.

DATE	16-Nov- 09
NO.	02
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

_Site Specific Safety Brief.

--Daily Safety Brief.

_Trimble XLT GPS File review.

_Staked out boundaries for 100% mag survey of EODS Demo Area and Advanced IED Area, and began vegetation management.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:
WEATHER CONDITIONS: Sunny, mid 60s, 2-5 mph breeze.	

PERSONNEL ON SITE: Craig Irland, Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Lee Allen, Trish Lemke

SIGNATURE: Tom Yancey DATE: 16-Nov-09

TETRA TECH NUS, INC.

DATE	17-Nov- 09
NO.	03
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Daily Safety Brief, discussed: site communications, PPE, rally point, emergency evacuation, emergency response.

-Preparatory instruction in detector-aided surface sweeps and vegetation management.

-Observed vegetation management practices.

-Observed Detector-Aided Surface Sweep ops.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:
WEATHER CONDITIONS: Cloudy, Hi 50s, 5-10 mph breeze.	

PERSONNEL ON SITE: Craig Irland, Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Lee Allen, Trish Lemke

SIGNATURE: Tom Yancey DATE: 17-Nov-09

TETRA TECH NUS, INC.

DATE	18-Nov- 09
NO.	04
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Daily Safety Brief, discussed safety observer duties, location of medical facility, safe driving to/from work.

-Preparatory instruction in refueling gas powered equipment using spill containment, and non-munitions scrap removal.

-Observed chainsaw procedures on deadfall timber.

VISITORS ON SITE: Susan Yates, Tech Div; Joe Rail/Navy RPM; Curtis DeTora/MDE; Richard Glover/MDE;Roy Karkosh/MDE.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, mid 50s, 5-10 mph breeze.	

PERSONNEL ON SITE: Craig Irland, Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Lee Allen, Trish Lemke

SIGNATURE: Tom Yancey DATE: 18-Nov-09

TETRA TECH NUS, INC.

DATE	19-Nov- 09
NO.	05
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Daily Safety Brief, discussed awareness and potential danger from wind dropping dead trees and limbs in work area, extra caution driving to Stump Neck in foggy conditions, watching for joggers/walkers on roads around site trailer and work sites.

-Discussed lightning hold procedures with all team members due to predicted weather for today.

-Shortened work day due to heavy rain.

-All team members drove route to hospital in La Plata, MD from Stump Neck Annex.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Rain, high 50's, 3-5mph winds	

PERSONNEL ON SITE: Craig Irland, Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Lee Allen, Trish Lemke

SIGNATURE: Tom Yancey DATE: 19-Nov-09

TETRA TECH NUS, INC.

DATE	20-Nov- 09
NO.	06
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Discussed proper lifting techniques to use when moving heavy brush and limbs from the magnetometer survey areas.

-Discussed inadvertent uncovering/moving hidden surface UXO while dragging brush out of the magnetometer survey areas.

-Reminded team members to change out of worn PPE, hydrate throughout the day and to check for ticks since weather is in a warming trend.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Clear, low 60's, 5 mph winds	
PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Lee Allen, Trish Lemke	
SIGNATURE: Tom Yancey	DATE: 20-Nov-09

TETRA TECH NUS, INC.

DATE	21-Nov- 09
NO.	07
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Discussed: Site communications, cell phone communication working at acceptable level.

-Discussed for a second time: Unintentional uncovering/moving hidden surface UXO while dragging brush out of the magnetometer survey areas.

-Reminded team members to wear PPE at all times, especially safety glasses due to increased risk of briar and branch injuries to the face; hydrate often due to labor intensive activity of cutting and moving brush.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Clear, low 60's, 5 mph winds	
PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Lee Allen, Trish Lemke	
SIGNATURE: Tom Yancey	DATE: 21-Nov-09

TETRA TECH NUS, INC.

DATE	22-Nov- 09
NO.	08
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Discussed: Awareness of other team members in the area when: a) swinging and throwing cut brush from investigation area; b) when pulling stakes out of stake quiver and driving stakes into the ground; c) when slashing with a machete. Any of these operations could cause serious injuries to the eyes, head and upper body. All team members must approach these operations with caution and announce your presence to others engaged in these operations who may not be aware that you just walked up behind them.

-Discussed: Awareness of pipes and reinforcing rods (rebar) sticking out of ground in areas where we are cutting brush, and the hazards of cutting into them with metal bladed weed eaters and chainsaws, or falling on them.

-Reminded team members that we had a heavy frost this morning and to completely scrape all the vehicle windows clear of frost before leaving the parking lot.

Acted as Safety Observer during brush cutting in Advanced IED Area.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Clear, high 50's, 5 mph winds in the afternoon.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Lee Allen, Trish Lemke

SIGNATURE: Tom Yancey DATE: 22-Nov-09

TETRA TECH NUS, INC.

DATE	23-Nov- 09
NO.	09
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Discussed: Slips, Trips, and Falls-especially hazardous in our work areas due to a) sapling stubs from brush cuttings, b) cut briar stalks on the ground, and c) rebar & pipe protruding above ground. All could inflict serious injuries to the face and hands which is why the PPE is so important.

-Discussed: PPE and its importance in the instances above.

-Discussed: Watch out for your team mates. Take the time to **visually** locate who you are paired with and assess their condition routinely. Just a glance at them is all that is needed. If they go down due to injury or bodily stress and you aren't aware of it due to the noise of the brush cutting equipment drowning out their attempts to call you over, precious minutes could be lost in rendering first aid or transport.

VISITORS ON SITE: Nicholas Corras, Environmental Div.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: Met with Nicholas Carros and Larry Kijek to discuss site work coordination within the explosive arc of Range 3. Weekend access is unrestricted, call for week day demo schedule and possible access Monday – Friday.
WEATHER CONDITIONS: Rain, cloudy ,high mid 50's, 5-10 mph winds.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Lee Allen, Trish Lemke

SIGNATURE: Tom Yancey DATE: 23-Nov-09

TETRA TECH NUS, INC.

DATE	30-Nov- 09
NO.	11
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Discussed: Getting back into work site awareness after Thanksgiving break: a) Give brushcutter and chainsaw an extra safety margin for operation b) Be aware of other team members around you when throwing brush or swinging a machete. c) Don't walk up in another team members' arc without letting them know you are there.

-Discussed: PPE: Every one re-equipped for work, nothing missing, all PPE in good useable condition.

-Discussed: OE precautions when cutting and dragging brush.

-Performed safety audit of each vehicle for required items.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Rain, cloudy, low 50's, 5-10 mph winds.	
PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke	
SIGNATURE: Tom Yancey	DATE: 30-Nov-09

TETRA TECH NUS, INC.

DATE	01-Dec-09
NO.	12
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Discussed: Hazards Communication Act of 1976 and a) what it does for employee safety. b) Material Safety Data Sheets (MSDS). c) Information contained in MSDS. d) Where ours are located.

-Discussed: Thoroughly removing frost from vehicle windows before driving. (Ticket offense in MD).

-Performed safety audit of Geophysics vehicle (new on site) and equipped with fire extinguisher and first aid kit.

VISITORS ON SITE: Nick Carros, Environmental Div, IH	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Sunny, mid 50's, 5-10 mph winds.	

PERSONNEL ON SITE: Craig Irland, Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Jim Coffman

SIGNATURE: Tom Yancey DATE: 01-Dec-09

TETRA TECH NUS, INC.

DATE	02-Dec-09
NO.	13
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Discussed: Staging fuel containers and gas powered equipment at least 50 feet from vehicles which are designated as a smoking area.

-Discussed: Eye hazards on work sites: Hanging briar, thorny bushy limbs, and wire which may be cut and thrown by weed eaters. Wear eye protection and all PPE while working. It's required by the work plan and Hasp.

-Discussed: Discarding worn out PPE and replacing unusable PPE.

-Discussed: Reporting injuries and being alert to cuts and punctures getting infected.

VISITORS ON SITE: None.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Rain, mid 50's, 5-10 mph winds.	

PERSONNEL ON SITE: Craig Irland, Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Jim Coffman

SIGNATURE: Tom Yancey DATE: 02-Dec-09

TETRA TECH NUS, INC.

DATE	03-Dec-09
NO.	14
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

-Discussed: Thoroughly washing hands before eating. Sanitary wipes, hand cleaner and paper towels are provided in each vehicle. Eat only in your vehicles or at the site trailer. Do NOT eat in the grid.

-Discussed: Wear eye protection and all PPE while working. Get a second pair of gloves so you can rotate out of wet gloves into dry gloves while the wet pair is drying.

-Discussed: Use caution when performing detector-aided visual sweep on slopes, especially after heavy rain like yesterday. Always keep one hand free to aid you in climbing up and down.

-Craig Irland, Site Manager completed an internal safety audit today.

VISITORS ON SITE: None.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Clear, low 60's, 5-10 mph winds.	

PERSONNEL ON SITE: Craig Irland, Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Jim Coffman

SIGNATURE: Tom Yancey DATE: 03-Dec-09

TETRA TECH NUS, INC.

DATE	06-Dec-09
NO.	17
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Cold stress, keeping warm, Proper dressing, PPE.

Discussed: Slips, Trips, Falls.

Discussed: Equipment Safety.

Discussed: Safe Driving, Icy Roads, Clear all vehicle windows.

VISITORS ON SITE: None.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 29 degrees, Clear, Winds NW at 8 MPH, High of 42	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Jim Coffman, Glen Childers

SIGNATURE: Glen Childers DATE: 06-Dec-09

TETRA TECH NUS, INC.

DATE	07-Dec-09
NO.	18
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Slips, Trips, Falls, especially when working in water.

Discussed: Staying Dry.

Discussed: Safety Equipment/Gear when using power tools.

Discussed: Not moving or touching suspected ordnance items.

VISITORS ON SITE: None.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 26 degrees, mostly cloudy, winds SSW 10-15 mph, hig of 47 degrees	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Jim Coffman, Glen Childers

SIGNATURE: Glen Childers DATE: 07-Dec-09

TETRA TECH NUS, INC.

DATE	08-Dec-09
NO.	19
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Slips, trips, falls, and physical hazards.

Discussed: Safety gear when operating cutting equipment.

Discussed: Safe work habits.

Discussed: Staying warm and dry while working.

VISITORS ON SITE: None.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 38 degrees, winds NNE 5-10 mph, High of 43 degrees, 20% chance of rain.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Jim Coffman, Glen Childers, Sean Huber, Rory Kennedy

SIGNATURE: Glen Childers DATE: 08-Dec-09

TETRA TECH NUS, INC.

DATE	09-Dec-09
NO.	20
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS: Discussed: Slips, trips, falls, and physical hazards. Discussed: Cold Stress. Discussed: Dead Falls. Discussed: Ordnance precautions.	
VISITORS ON SITE: None.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 43 degrees, winds NE at 8 mph, high of 56 degrees, winds increasing to 15-25 mph	IMPORTANT PHONE CALLS: Called Nick Carros, Navy on site representative, and reported MEC located today.
PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Jim Coffman, Glen Childers, Sean Huber, Rory Kennedy	

TETRA TECH NUS, INC.

SIGNATURE: Glen Childers DATE: 08-Dec-09

TETRA TECH NUS, INC.

DATE	14-Dec-09
NO.	20
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Slips, trips, falls, and physical hazards.

Discussed: Staying dry, cold chill.

Discussed: Driving safety, icy roads, fog.

Discussed: Proper safety gear and PPE when using power equipment.

Discussed: UXO Precautions.

VISITORS ON SITE: None.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 33 degrees, fog clearing late morning, winds SW 510 mph, high of 50	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Glen Childers

SIGNATURE: Glen Childers DATE: 14-Dec-09

TETRA TECH NUS, INC.

DATE	15-Dec-09
NO.	21
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Slips, trips, falls, and physical hazards.

Discussed: Layering clothing and staying dry.

Discussed: Water and boat safety.

While leaving the Stump Neck Impact area, the team located some Japanese Type 3 mine parts. All the parts were empty and are munitions debris.

VISITORS ON SITE: None.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 46 degrees, mostly cloudy, winds NW at 10 -15 mph, high in mid 50's	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Glen Childers

SIGNATURE: Glen Childers DATE: 15-Dec-09

TETRA TECH NUS, INC.

DATE	16-Dec-09
NO.	22
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Slips, trips, falls.

Discussed: Layering of clothing, cold stress

Discussed: Boat safety, floatation devices.

Discussed: Dead falls and safety in wooded areas.

VISITORS ON SITE: None.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 35 degrees, partly cloudy, winds 10 -20 mph, high near 40 degrees	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Glen Childers

SIGNATURE: Glen Childers DATE: 16-Dec-09

TETRA TECH NUS, INC.

DATE	17-Dec-09
NO.	23
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Slips, trips, falls.

Discussed: Water safety and Equipment safety.

Discussed: UXO precautions and avoidance.

VISITORS ON SITE: Joe Rail (NAVFAWASH)	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 28 degrees, clear, winds NW 10 - 15, High near 40 degrees	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Glen Childers

SIGNATURE: Glen Childers DATE: 17-Dec-09

TETRA TECH NUS, INC.

DATE	18-Dec-09
NO.	24
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Slips, trips, falls.

Discussed: Water safety and Equipment safety.

Discussed: Cold stress, proper PPE

VISITORS ON SITE: Joe Rail (NAVFAWASH)	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 30 degrees, winds light and variable, cloudy, high near 37 degrees.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Glen Childers

SIGNATURE: Glen Childers DATE: 18-Dec-09

TETRA TECH NUS, INC.

DATE	19-Dec-09
NO.	25
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Proper Dress for weather, Safe Driving, DUI, Not Driving while tired, Cold Stress.

NO WORK TODAY BECAUSE OF WEATHER

VISITORS ON SITE	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: 28 degrees, snow, additional accumulation of 10 -15 inches accumulation, winds N 20 – 30 mph, blizzard warning, high of 31 degrees.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Trish Lemke, Glen Childers

SIGNATURE: Glen Childers DATE: 19-Dec-09

TETRA TECH NUS, INC.

DATE	04 Jan 10
NO.	26
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Overhead hazards due to ice-covered limbs and dead trees with 15 – 20 mph winds predicted. Use safety observer since brush cutters will be wearing hearing protection.

Discussed: Keep close check on exposed flesh due to wind chill factor and change wet gloves and socks as soon as possible.

Discussed: Extreme eye hazard and terrain hazard. Wear PPE, cover face with folded arms if you fall on ice or snow in areas with metal and brush stubs.

Discussed: Live ordnance on site, be aware,be observant.

Initial Safety Briefing conducted for Alfred Smith.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 32, 15 – 20 mph, possible snow flurries with no accumulation.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith, Craig Irland.

SIGNATURE: Tom Yancey DATE: 04 Jan 10

TETRA TECH NUS, INC.

DATE	05 Jan 10
NO.	27
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Best preventive measure for frostbite is the buddy system-keep check on your team members-look for whiter waxy appearance of skin on face, ears, and extremities. Massage ears, face, and extremities during warm-up breaks.

Discussed: Avoid alcohol and caffeine; eat more carbs, protein, and fatty foods in colder weather.

Discussed: Air Blast Pond Site: Watch for cable and wire while using the chain saw and brush cutter in this area. Deadfall on this site is full of hardware such as nails, bolts, metal plates, etc. Rusty cable and wire look a lot like vines so be wary. Use care when pulling rusty cable out of the way of cutting ops, the rusted strands break and are very sharp and will penetrate cheap leather gloves.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 33, cloudy, chance of snow flurries, wind 5 – 10 mph.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Alfred Smith, Trish Lemke, Jim Coffman.

SIGNATURE: Tom Yancey DATE: 05 Jan 10

TETRA TECH NUS, INC.

DATE	06 Jan 10
NO.	28
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Speed on base is 30 mph – a) watch for joggers/walkers on road sides. b) personnel in crosswalks in the early hours prior to day break. c) Truck traffic on Roach Road when turning into site trailer.

Discussed: Replace PPE when worn or damaged (Let me know).

Discussed: Area 8: Beware of rotted out stumps covered in leaves, major ankle injury possible.

VISITORS ON SITE: Nicholas Carros and Travis Wray, Environmental Div. NSF-IH.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: Notified that Range 3 will be inactive 08 Jan 10 allowing access to Valley Impact Area T1 – T13.
WEATHER CONDITIONS: High 38, cloudy, chance of snow flurries, wind 5 – 10 mph.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Alfred Smith, Trish Lemke, Jim Coffman.

SIGNATURE: Tom Yancey DATE: 06 Jan 10

TETRA TECH NUS, INC.

DATE	07 Jan 10
NO.	29
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: No eating or smoking in the grid, return to vehicle or site trailer and **wash hands** before eating or smoking. Remember, these sites have other chemical contaminants than usually associated with UXO and explosives and ingestion is the primary path.

Discussed: Continue taking frequent warm-up breaks and check face and hands for cold injuries.

Discussed: Layered clothing- Important in cold weather because: a) Traps and warms air between layers for added warmth. b) Can be removed layer by layer if work becomes more strenuous. Not good to get inner layer damp with sweat and be unable to remove it. Can cause chills later as work tempo decreases.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 38, cloudy, wind 5 – 10 mph.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Alfred Smith, Trish Lemke, Jim Coffman.

SIGNATURE: Tom Yancey DATE: 07Jan 10

TETRA TECH NUS, INC.

DAILY QUALITY CONTROL REPORT

Contract Number: N62467-04-D-0055	MMRP Site Inspection Naval Support Facility Indian Head, MD; Project 112G00810	
Report Number: 28	Location: Stump Neck Annex	Date: 07Jan 10

Phase	List Definable Features of Work, Locations, and List Personnel Present: Scott Roberts, Tom Yancey, Frank Montes, Trish Lemke, Alfred Smith, Jim Coffman.	
Preparatory	Site Preparation: Grid Survey and Layout – Area 8, Continued monitoring the marking of groups of air shot and water shot locations in preparation for the detector-aided surface sweep.	
Initial		Inspection Performed
Follow up	Detector-Aided Surface Sweep, Vegetation Management: Valley Impact Area Transects 14, 15 wetlands portion.	Inspection Performed 100% QC of wetlands portion of V IA T14, T15. No discrepancies noted. All brush cutting performed IAW work plan and HASP.

Rework Items Identified Today (Not Corrected by Close of Business) None	Rework Items Corrected Today: None

Remarks: None

On behalf of the contractor, I certify that this report is complete and correct and the equipment and material used and work performed during this reporting period is in compliance with the contract drawings and specifications to the best of my knowledge except as noted in this report.	Tom Yancey Project Quality Control Officer Date 07 Jan 10

Client Quality Assurance

_____ _____

Client QA Representative Date

TETRA TECH NUS, INC.

DATE	08 Jan 10
NO.	30
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Last night's 2-3" of snow: a) Clear all vehicle windows before leaving parking lot, MD gives tickets for obscured windows/windshields. b) Watch for inexperienced drivers on the snow and adjust your speed to road conditions. c) Be sure of your footing when using chainsaw and brush cutters in the snow.

Discussed: Continue taking warm up breaks and checking extremities for cold injuries.

Discussed: Cutting and sweeping transects inside the Range 3 arc: New area for us so be aware of possible raw explosives, blasting caps, ordnance components. They won't be as corroded as what we have seen in the other sites here.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Accumulated 2-3" of snow overnight, high 33 dropping to mid 20's, cloudy, wind 5 – 10 mph.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Alfred Smith, Trish Lemke, Jim Coffman.

SIGNATURE: Tom Yancey DATE: 08Jan 10

TETRA TECH NUS, INC.

DATE	09 Jan 10
NO.	31
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Be sure of your footing when using chainsaw and brush cutters in the snow.

Discussed: Continue taking warm up breaks and checking extremities for cold injuries.

Discussed: Cutting and sweeping transects inside the Range 3 arc: New area for us so be aware of possible raw explosives, blasting caps, ordnance components.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 30 dropping to mid 20's, cloudy, wind 5 – 10 mph.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Alfred Smith, Trish Lemke, Jim Coffman.

SIGNATURE: Tom Yancey DATE: 09 Jan 10

TETRA TECH NUS, INC.

DATE	10 Jan 10
NO.	32
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Be sure of your footing in Area 8- Slopes covered in dry leaves and topped with snow are extremely slippery. Take your time and keep one hand free for bracing on trees/limbs.

Discussed: Additional trip hazards in Area 8: Firing circuit wiring, cap wires, cable/wire rope on the surface.

Discussed: Constant vigilance for signs of cold injuries, take frequent warm-up breaks, upgrade cold weather clothing if necessary.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 31 dropping to mid 20's, cloudy, wind 5 – 10 mph.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Alfred Smith, Trish Lemke.

SIGNATURE: Tom Yancey DATE: 10 Jan 10

TETRA TECH NUS, INC.

DATE	11 Jan 10
NO.	33
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Brush cutting in Air Blast Pond site, hazards associated with cable/wire rope and wire entangled in deadfall. Importance of chainsaw chaps and gloves.

Discussed: Additional trip hazards and metal pipes, conduit, rebar, and cable anchors embedded in the ground and presenting a puncture hazard if you fall onto them.

Discussed: Proper method of freeing a pinched chain saw bar from a partially cut tree: a) Shut off saw motor. b) Have safety observer pry up on tree while operator supports saw. c) Gently remove saw as tree cut releases pinch grip. DO NOT rev saw and try to jerk the bar free!

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 33 dropping to high 20's, sunny, wind 5 – 10 mph.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Alfred Smith, Trish Lemke.

SIGNATURE: Tom Yancey DATE: 11 Jan 10

TETRA TECH NUS, INC.

DATE	12 Jan 10
NO.	34
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Brush cutting at Basic IED site, hazards associated with cable/wire rope and wire entangled in deadfall. Importance of chainsaw chaps and gloves.

Discussed: Additional trip hazards and metal pipes, conduit, rebar, and cable anchors embedded in the ground.

Discussed: Proper method of operating a brush cutter with metal blade: a) After starting unlock the trigger and drop the rpms to cool the engine periodically. Don't leave the trigger locked and run it that way through a whole tank of fuel mix. b) Don't cut dead hardwood with the brush cutter unless it's twig sized. c) Be careful of others in the area when cutting.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 35, sunny, wind 5 – 10 mph.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Alfred Smith, Trish Lemke.

SIGNATURE: Tom Yancey DATE: 12 Jan 10

TETRA TECH NUS, INC.

DATE	13 Jan 10
NO.	35
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Detector-Aided Surface Sweep techniques on sloped terrain: First priority is safety, be sure of your footing.

Discussed: Additional trip hazards and metal pipes, conduit, rebar, and cable anchors embedded in the ground.

Discussed: **WEAR YOUR PPE!** Four day week end coming up, don't risk an injury that your PPE could minimize or prevent. Gloves are very important when you are trying to break a fall or you are sliding head-first downhill.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 37, sunny, calm.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Alfred Smith, Trish Lemke.

SIGNATURE: Tom Yancey DATE: 13 Jan 10

TETRA TECH NUS, INC.

DATE	18 Jan 10
NO.	36
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Detector-Aided Surface Sweep techniques on sloped terrain: Don't get over-balanced swinging the White's detector, take your time on the slopes. First priority is safety, be sure of your footing. Use extra caution today due to yesterday's rain. Keep one hand free to brace or check slips or falls.

Discussed: Additional trip hazards and metal pipes, conduit, rebar, and cable anchors embedded in the ground. Also, watch for loose rocks and holes under the leaves. Make sure you have solid ground under foot before putting all your weight into your step.

Discussed: **CHECK YOUR PPE!** Make sure you have all your PPE and that it's in good condition. Check vehicles for first aid kits and fire extinguishers before leaving site trailer.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 53, partial sun, calm winds.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Alfred Smith, Trish Lemke.

SIGNATURE: Tom Yancey DATE: 18 Jan 10

TETRA TECH NUS, INC.

DATE	19 Jan 10
NO.	37
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Eye hazards at Air Blast Pond site: Eye--level tree limbs, thorny branches, briar, wire and cable strung through trees and brush.

Discussed: Extreme trip hazards at the Air Blast Pond site: Rebar, conduit, metal pipes, cable anchors embedded in the ground could cause serious puncture injuries if a fall occurs. Watch your footing and avoid entanglement that could cause a fall.

Discussed: **Eye protection is mandatory.**

Provided site specific safety brief for Jacob Birkett.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 54, sunny, winds 5-10 mph.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

SIGNATURE: Tom Yancey DATE: 19 Jan 10

TETRA TECH NUS, INC.

DATE	20 Jan 10
NO.	38
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed: Eye hazards at Air Blast Pond site: Eye--level tree limbs, thorny branches, briar, wire and cable strung through trees and brush.

Discussed: Extreme trip hazards at the Air Blast Pond site: Rebar, conduit, metal pipes, cable anchors embedded in the ground could cause serious puncture injuries if a fall occurs. Watch your footing and avoid entanglement that could cause a fall.

Discussed: **Eye protection is mandatory.**

Discussed: Importance of checking yourself for ticks during and after work since two were found yesterday.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mid 40s, cloudy, chance of showeres.,	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

SIGNATURE: Tom Yancey DATE: 20 Jan 10

TETRA TECH NUS, INC.

DATE	21 Jan 10
NO.	39
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Discussed:

Attention Sampling Team Safety Escorts: Be aware of ordnance in all sites, even though an area has been investigated; continue to look for surface ordnance as well as down-hole for augers. Transect spacing varies from 40' to 400' and undocumented ordnance can still be found between transects. Yesterday, we found a 250 lb only 14' off a transect center line. This item wasn't detectable by a GA-52 at this distance and at the time we did the transect the bomb was under a downed tree and surrounded by briar and weeds. The recent 24" plus snow flattened the dead tree and other vegetation, melted, then exposed the bomb to view. Continue to report these post-investigation ordnance finds as the data is still pertinent **and** continue to be on the lookout for them.

Discussed: Extreme trip hazards at the Air Blast Pond and Area 8 sites: Rebar, conduit, metal pipes, and cable anchors embedded in the ground could cause serious puncture injuries if a fall occurs. Watch your footing and avoid entanglement that could cause a fall.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 40s, partly cloudy.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

TETRA TECH NUS, INC.

SIGNATURE: Tom Yancey DATE: 21 Jan 10

TETRA TECH NUS, INC.

DATE	22 Jan 10
NO.	40
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS: DRIVING SAFETY

- Be aware of MD aggressive drivers and inexperienced drivers, especially in bad weather. Leave an extra car length or two of space ahead of your vehicle.

-Speed limit on base is 30 mph.

-Watch for joggers and walkers at all times especially pre-dawn.

-Watch for pedestrians in the cross walk just inside the gate while you are stowing badges and driver's licenses.

-Careful turning in to site trailer off Archer Road. There is traffic on Roach Road.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High upper 30's, rain.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

SIGNATURE: Tom Yancey DATE: 22 Jan 10

TETRA TECH NUS, INC.

DATE	23 Jan 10
NO.	43
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS: Work Site

- Some work areas will still be flooded today, be aware of trip hazards, impalement hazards and entanglement hazards under the water. Slide feet along the bottom rather than step in and out of the water.

-Gloves and safety glasses are mandantory.

-Report all rusty metal cuts and punctures the day they occur..

-Careful climbing over deadfalls, the dead wood is saturated with rain and is extremely slick. Try to step over rather than step on.

-Watch for unexpected traffic on Roach Road when leaving site trailer..

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Upper 50's, sunny, calm.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

SIGNATURE: Tom Yancey DATE: 23 Jan 10

TETRA TECH NUS, INC.

DATE	24 Jan 10
NO.	44
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Site Safety	

SAFETY BRIEF TOPICS

Discussed the following:

- Hospital Location is in La Plata. The route map is in each vehicle, posted in the site trailer, and in the Health and Safety Plan.

-Primary means of communications between teams are cell phone, voice, and hand signal.

-Be aware of others in your immediate work area. Use caution when throwing cut brush out of the way, metallic trash out of your sweep lane and letting branches spring back into position.

-Careful climbing over deadfalls, the dead wood is saturated with rain and is extremely slick. Try to step over rather than step on.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Upper 40's, cloudy, rain.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Mark Soha, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

SIGNATURE: Tom Yancey DATE: 24 Jan 10

TETRA TECH NUS, INC.

DATE	25 Jan 10
NO.	45
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS: SAFE WORK PRACTICES

Discussed the following:

- Use the buddy system/2 man rule for all activities on this site.

-Use proper lifting techniques for heavy loads. Get help with the load or break it down into smaller, manageable loads.

-Clear routes/trails to sampling sites before carrying in sampling equipment. Even if transects/trails were previously cleared, last night's wind probably dropped dead branches on them creating trip hazards.

-Wash hands thoroughly before eating, drinking, smoking. Gloves help keep your hands clean but are not 100% effective. Remember, ingestion is primary route of entry for all contaminants on our site.

If UXO is found in path to or on sampling location mark it for avoidance or adjust sampling location or route of entry. No movement/relocation of UXO is permitted on this site.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Upper 50s, cloudy, rain ending late morning..	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

TETRA TECH NUS, INC.

SIGNATURE: Tom Yancey DATE: 25 Jan 10

TETRA TECH NUS, INC.

DATE	26 Jan 10
NO.	46
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS: SAFE WORK PRACTICES

Discussed the following:

- Use caution when repositioning and maneuvering the long PVC pipe sections. The sampling team members' feet will be embedded in the mud and they won't be able to take evasive action to avoid getting hit in the head.

- When driving the PVC sections into the sediment, ensure the person holding the block of wood over the PVC pipe has hands a safe distance from the point of impact. Also, the person swinging the sledge hammer should position his feet as firmly as possible to ensure the best possible control over the hammer swing.

- Check PPE daily for serviceability. Safety glasses are mandatory

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Upper 40s, sunny most of the day, winds calm.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

SIGNATURE: Tom Yancey DATE: 26 Jan 10

TETRA TECH NUS, INC.

DATE	27 Jan 10
NO.	467
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS: INJURY FIRST AID AND REPORTING

Discussed the following: Extreme terrain hazards leading to slips, trips, and falls in the Stump Neck Impact Area.

- Cuts and punctures in and around Stump Neck Impact Area should get immediate first aid to clean and protect the wound from the water and soil in the marsh. Clean/flush the injury with alcohol or peroxide as soon as possible and cover with bandage and clean gloves.

- Report these injuries as they occur and continue to watch for signs of infection. Also report any ankle or other joint injury as soon as possible.

- For the team working at the Basic IED Area, be aware of the laser testing up at the parking lot. Don't drive by the building without contacting the test director for safe passage.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Upper 40s, sunny most of the day, winds calm.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

SIGNATURE: Tom Yancey DATE: 27 Jan 10

TETRA TECH NUS, INC.

DATE	27 Jan 10
NO.	47
SHEET	1 OF 1

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS: INJURY FIRST AID AND REPORTING

Discussed the following: Extreme terrain hazards leading to slips, trips, and falls in the Stump Neck Impact Area.

- Cuts and punctures in and around Stump Neck Impact Area should get immediate first aid to clean and protect the wound from the water and soil in the marsh. Clean/flush the injury with alcohol or peroxide as soon as possible and cover with bandage and clean gloves.

- Report these injuries as they occur and continue to watch for signs of infection. Also report any ankle or other joint injury as soon as possible.

- For the team working at the Basic IED Area, be aware of the laser testing up at the parking lot. Don't drive by the building without contacting the test director for safe passage.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Upper 40s, sunny most of the day, winds calm.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Alfred Smith, Trish Lemke, Terry Rojahn, Jacob Birkett.

SIGNATURE: Tom Yancey DATE: 27 Jan 10

TETRA TECH NUS, INC.

DATE	02 Feb 10
NO.	47
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS: EXTREME TERRAIN IN TEST SITE ONE

Discussed the following: Extreme terrain hazards leading to slips, trips, and falls in Test Site 1.

- Test Site 1 has more metal debris, rusted cable, wire, and metal anchors, conduit, pipe embedded in the ground than Air Blast Pond Site. A fall in this area could lead to serious puncture injuries or rusty metal cuts so be slow and methodical while performing detector-aided surface sweeps in this area.

- The 6 inches of snow cover will obscure most of these hazards so take extra care in walking and climbing through the debris.

-MC Sampling Team working in Stump Neck Impact Area be aware that underneath the thin, level ice is a very rough terrain of root clumps, muskrat channels and holes. The tide has moved out so there will be a 3” to 16” drop through the thin ice crust to the ground underneath.

- All teams take warm up breaks and keep a close check for frostbite; take notice of your team mate’s face, look for discolored skin patches or waxy skin appearance.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 38, sunny most of the day, winds calm.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Bruce Carnal, Alfred Smith, Trish Lemke, Fred Ramser, Terry Rohajn, Jacob Birkett..

TETRA TECH NUS, INC.

SIGNATURE: Tom Yancey DATE: 02 Feb 10

TETRA TECH NUS, INC.

SAFETY DAILY LOG

DATE	03 Feb 10
NO.	48
SHEET 1 OF 1	

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS: EXTREME TERRAIN IN TEST SITE ONE

Discussed the following: Extreme terrain hazards leading to slips, trips, and falls in Test Site 1.

- Test Site 1 has more metal debris, rusted cable, wire, and metal anchors, conduit, pipe embedded in the ground than Air Blast Pond Site. A fall in this area could lead to serious puncture injuries or rusty metal cuts so be slow and methodical while performing detector-aided surface sweeps in this area. If you fall while carrying a load, toss the load and cover your face with your arms to protect eyes and teeth.

- The additional 3" inches of snow cover from last night will obscure most of these hazards so take extra care in walking and climbing through the debris.

- All teams take warm up breaks and keep a close check for frostbite; take notice of your team mate's face, look for discolored skin patches or waxy skin appearance.

- Before leaving the parking lot clear all vehicle windows of snow. MD issues tickets for driving with obstructed windows.

- Conducted safety brief for Areaa 8 pond sediment sampling from boat.

-Conducted UXO safety brief for Craig Ulrich from EnviroScan.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 41, cloudy most of the day, winds calm.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Bruce Carnal, Alfred Smith, Trish Lemke, Fred Ramser, Terry Rohajn, Jacob Birkett..

TETRA TECH NUS, INC.

SIGNATURE: Tom Yancey DATE: 03 Feb 10

TETRA TECH NUS, INC.

DATE	04 Feb 10
NO.	49
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS: - WINTER DRIVING CONDITIONS

- MD known for aggressive drivers, allow extra car length or two between you and the vehicle ahead of you when driving to and from work.

- Speed limit on base 30 mph. Watch for joggers/walkers in ANY weather, at ANY time of day.

- Driving conditions will likely be hazardous on the trip back to the motel Friday due to new winter storm moving in.

- Keep extra change of clothes especially socks and gloves in your vehicle in case you get wet during work.

- Continue to take warm up breaks and take precautions for frostbite.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 41, sunny most of the day, winds calm.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Mark Soha, Bruce Carnal, Alfred Smith, Trish Lemke, Fred Ramser, Terry Rohajn, Jacob Birkett, Craig Ulrich.

SIGNATURE: Tom Yancey DATE: 04 Feb 10

TETRA TECH NUS, INC.

DATE	08 Feb 10
NO.	51
SHEET 1 OF 1	

SAFETY DAILY LOG

PROJECT NAME: : MMRP Site Inspection, Naval Support Facility, Indian Head, MD	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Safety

SAFETY BRIEF TOPICS:

- Secondary roads to Stump Neck aren't cleared yet. Still have 2-3" of compacted snow turned to ice so keep speed appropriate for road conditions.

- Keep safety glasses on while pulling pin flags and stakes in briar/brushy areas.

- Take warm up breaks whenever you need them. Each team member determine when to break based on your own foot comfort level. We will be walking/standing in 20" + of snow so don't over extend periods between breaks.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: High 33, sunny, winds calm.	

PERSONNEL ON SITE: Scott Roberts, Tom Yancey, Frank Montes, Bruce Carnal, Alfred Smith, Trish Lemke.

SIGNATURE: Tom Yancey DATE: 08 Feb 10

SECTION 4

FIELD ACTIVITY DAILY LOGS

TETRA TECH NUS, INC.

DATE	11/15/09
NO.	01
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Management Mobilization, Site Prep	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

UXO Project Manager Craig Irland, UXO Safety/Quality Control Specialist Tom Yancey and I met at the Residence Inn in Waldorf MD to review the site Work Plan and Safety and Health Plan. The three of us mobilized yesterday.

All traveled to the work site for orientation, obtaining base access badges and site preparation.

Site prep, orientation, access badge issue and purchasing of supplies for operations were completed.

Ceased ops for the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 71F, low of 45F, winds mostly WNW at 0-7 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 3	
Prepared by: Scott Roberts, SUXOS	DATE: 11/15/09, Sunday

TETRA TECH NUS, INC.

DATE	11/16/09
NO.	02
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Site Personnel Mobilization, Site Prep, EOD Demo Area, Advanced IED Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Tetra Tech UXO Program Manager Ralph Brooks, UXO Project Manager Craig Irland, UXO Safety/Quality Control Specialist Tom Yancey and I met at the Residence Inn in Waldorf MD with the four UXO Technicians that mobilized yesterday to review the Work Plan and Safety and Health Plan.

Site PM, UXOSO/QCS, SUXOS and UXO technicians traveled to the work site at Stump Neck for orientation, to accept equipment delivery and for site preparation.

Site equipment was checked, communications checks were good, began field ops.

Brush cutting and boundary stake placement was completed in the 100% coverage areas of the EOD Demo Area and the Advanced IED Area. All transect stakes were placed in the EOD Demo Area (14 total).

Ceased ops for the day, no violations or discrepancies noted.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 63F, low of 40F, winds mostly NE at 0-6 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 7 UXO field personnel

Prepared by: Scott Roberts, SUXOS DATE: 11/16/09, Monday

TETRA TECH NUS, INC.

DATE	11/17/09
NO.	03
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: EOD School Demo Area, Advanced IED Area	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. GPS training was accomplished.

Schonstedt checks were good, communications and equipment checks were good,

Two UXO techs completed brush cutting at the Advanced IED Area using the skid steer; remaining UXO techs performed Schonstedt sweeps of the EOD School Demo Area 100% coverage section.

The EOD School Demo Area 100% coverage section Schonstedt sweep was completed. The area still needs to be swept with the White's XLT. One Munitions Debris item (no hazard) was located, part of an aluminum nose fuze, on the surface. The item designation is: ESDA-01 at Northing-322962.34, Easting-1249691.14

Transects 1-7 in the EOD School Demo Area were brush-cut and the area to be swept was marked with PVC flags.

Ceased ops for the day, no violations or discrepancies noted. A generator was delivered to power the site trailer.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 61F, low of 43F, winds mostly NE at 0-8 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 7, UXO personnel	
Prepared by: Scott Roberts, SUXOS	DATE: 11/17/09, Tuesday

TETRA TECH NUS, INC.

DATE	11/18/09
NO.	04
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: EOD School Demo Area, Torpedo Burial Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Schonstedt, White's XLT, commo and equipment checks were good. GPS accuracy verified.

EOD School Demo Area transects 8-14 were brush-cut, marked with PVC flags, and Schonstedt swept. White's XLT sweep in the 100% coverage section was also completed. No MEC or MD was located in the transects. One item which is possibly MD was located during the White's sweep of the 100% coverage section. More research will be performed to ensure an accurate determination is made and reported tomorrow. More brush cutting was performed over the entire EOD School Demo Area for future Geophysical data collection, PVC flags were left in place for reference.

The boundaries of the Torpedo Burial Area were marked using wooden stakes, PVC pin flags, and flagging ribbon.

Ceased ops for the day, no violations or discrepancies noted. Magnetometers and GPS were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: Joseph Rail, Susan Yates, Curtis DeTore, Richard H. Glover and Roy Karkosh	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mostly cloudy, high of 56F, low of 41F, winds mostly ENE at 0-8 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 7 UXO personnel. 5 site visitors

Prepared by: Scott Roberts, SUXOS DATE: 11/18/09, Wednesday

TETRA TECH NUS, INC.

DATE	11/19/09
NO.	05
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Torpedo Burial Area	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. commo and equipment checks were good. GPS accuracy verified.

All necessary brush cutting was completed in the Torpedo Burial Area.

Ceased field ops due to thunderstorms. Equipment was cleaned and maintenance was performed. All personnel traveled back to the hotel to complete required annual conflict of interest training.

No determination was made on the possible Munitions Debris item located in the EOD School Demo Area, it is still being researched and I expect a determination will be made tomorrow.

No violations or discrepancies noted.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mostly cloudy, high of 58F, low of 42F, winds mostly E at 0-6 mph, thunderstorms.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 7 UXO personnel	
Prepared by: Scott Roberts, SUXOS	DATE: 11/19/09, Thursday

TETRA TECH NUS, INC.

DATE	11/20/09
NO.	06
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Torpedo Burial Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. commo and equipment checks were good. GPS accuracy verified. No work was performed today in the Torpedo Burial Site due to a high level of standing water.

Two UXO Techs cut brush using a chainsaw and a weedeater in the Advanced IED Area 100% coverage section. Completed approximately 50% of necessary brush cutting.

The boundary of the Air Blast Pond was marked and the skid steer brush cutter was used to accomplish approximately 50% of necessary brush cutting.

A determination was made on the Munitions Debris item located in the EOD School Demolition Area; it is part of a German bomb fuze assembly. The determination was made after work hours, coordinates and a photograph will be in tomorrow's report.

No violations or discrepancies noted.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mostly sunny, high of 61F, low of 36F, winds mostly E at 0-8 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 6 UXO personnel

Prepared by: Scott Roberts, SUXOS DATE: 11/20/09, Friday

TETRA TECH NUS, INC.

DATE	11/21/09
NO.	07
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Torpedo Burial Site, Advanced IED Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Schonstedt and equipment checks were good. GPS accuracy verified. Allen and Lemke were not allowed base access today as they were not on the weekend/after hours access roster. They performed support and admin tasks off site for 8 hours and steps are being taken to ensure access for the next weekend work cycle.

Two UXO Techs cut brush using a chainsaw and a weedeater in the Advanced IED Area 100% coverage section. Approximately 80% of necessary brush cutting has been completed. Transects 1-11 were staked on the North boundary.

The Torpedo Burial Site Schonstedt sweep was completed but the Whites XLT sweep and Quality Control checks still need to be done. No MEC located. One MD item, torpedo casing, ferrous metal. Located at Northing 322677.64, Easting 1249510.80

The item from the EOD School Demolition Area that was being researched is part of a German Bomb fuze and booster cup assembly, no hazard. There is a hole in the booster cup near the base and no explosives were present. Location is Northing 323083.64, Easting 1249797.43

No violations or discrepancies noted. Magnetometers and GPS were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 56F, low of 40F, winds mostly N at 0-4 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 4 UXO personnel

TETRA TECH NUS, INC.

Prepared by: Scott Roberts, SUXOS DATE: 11/21/09, Saturday

TETRA TECH NUS, INC.

DATE	11/22/09
NO.	08
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Torpedo Burial Site, Advanced IED Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Whites XLT and equipment checks were good. GPS accuracy verified.

All necessary brush cutting was completed in the Advanced IED Area 100% coverage section.

Approximately 40% of the Torpedo Burial Site Whites XLT sweep was accomplished. No MEC or MD located.

No violations or discrepancies noted. Magnetometer and GPS were tested and verified at various times throughout the day and at the end of the day. Allen and Lemke performed support and admin tasks off site for 8 hours.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mostly sunny, high of 56F, low of 41F, winds mostly NNE at up to 8 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 4 UXO personnel

Prepared by: Scott Roberts, SUXOS DATE: 11/22/09, Sunday

TETRA TECH NUS, INC.

DATE	11/23/09
NO.	09
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Torpedo Burial Site, Stump Neck Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Whites XLT and equipment checks were good. GPS accuracy verified.

UXO Team set stakes on the North end of transects 2-24 in the Stump Neck Impact Area. Transect 1 on the West end of the area could not be staked as it is in the Chicamuxen Creek and is not accessible.

Torpedo Burial Site Whites XLT sweep was completed. No MEC or MD located.

Transects were established in the Advanced IED Area. There are 5 more transects to establish.

No violations or discrepancies noted. Magnetometer and GPS were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: Nick Carros, Navy On-Site Representative at Indian Head	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Overcast, high of 52F, low of 45F, winds mostly NE at up to 11 mph light to moderate rainfall from 1030 till end of the day.	IMPORTANT TELEPHONE CALLS: Sunbelt Equipment Rentals. Spoke to Chris W. to arrange pick up of the Skid Steer w/brush cutter attachment and weedeater 222815 (broken gas cap). If possible the weedeater will be swapped with a gas powered hedge trimmer. The off rent confirmation number is 4511643.

PERSONNEL ON SITE: 6 UXO personnel, 1 site visitor

Prepared by: Scott Roberts, SUXOS DATE: 11/23/09, Monday

TETRA TECH NUS, INC.

DATE	11/30/09
NO.	11
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area, Torpedo Casing Disposal Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, UXO personnel present. Commo, equipment checks were good. GPS accuracy verified. All personnel were off work 11/25 thru 11/30. Lee Allen resigned and will not be returning to the site.

Sunbelt Rentals delivered a 2" pump for de-watering part of Advanced IED Area and picked up the weedeater with the broken gas cap (222815). The Skid Steer was picked up during the period we were off work last week.

Today we completed another 50% of necessary transect brush cutting for a total of 90% in the Advanced IED area.

In the Torpedo Casing Disposal Area, transects 16 and 15 were established, sweep lanes marked and brush cut.

No violations or discrepancies noted. GPS units were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Overcast, high of 56F, low of 36F, winds mostly W up to 8 mph light to moderate intermittent rainfall started at 1030.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 5 UXO personnel

Prepared by: Scott Roberts, SUXOS DATE: 11/30/09, Monday

TETRA TECH NUS, INC.

DATE	12/01/09
NO.	12
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present, In addition Site Manager Craig Irland and Project Geophysicist Jim Coffman are present. Commo, Schonstedt, Whites XLT and equipment checks were good. GPS accuracy verified.

One UXO Tech performed Geophysical anomaly reacquisition for 33 points on Roach Road Rifle Range till 1100.

Instrument Test Strip setup was completed.

Schonstedt sweeps performed on transects 6-19 in the Advanced IED area. Whites XLT sweep performed on transects 15-19. Located 19 questionable items, they are being researched to determine their classification (MEC-MD-etc...).

No violations or discrepancies noted. Schonstedts, Whites XLT and GPS units were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mostly sunny, high of 52F, low of 36F, winds mostly WNW up to 8 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 5 UXO personnel, 1 Site Manager, 1 Project Geophysicist

Prepared by: Scott Roberts, SUXOS DATE: 12/01/09, Tuesday

TETRA TECH NUS, INC.

DATE	12/02/09
NO.	13
SHEET	1 OF 2

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present, In addition Site Manager Craig Irland and Project Geophysicist Jim Coffman are present. Commo, Schonstedt, Whites XLT and equipment checks were good. GPS accuracy was verified.

Whites XLT sweep performed on transects 12-14, 18 items were located and are being researched to determine classification.

Schonstedt and Whites XLT sweep performed on 30% of the Advanced IED Area 100% section. Located 4 possible MEC items and 8 MD items. Water was pumped out of SWMU-27. Numerous possible MEC and MD items are located inside. The UXOSO/QCS took photos.

AIEDA 100% section

Item 1: 90mm HEAT, possible MEC, located at Northing-321404.73, Easting-1245214.35

Item 2: Incendiary Bomb (empty), 6lb, MD, located at Northing-321339.18, Easting-1245209.06

Item 3: Incendiary Bomb (empty), 6lb, MD, located at Northing-321340.80, Easting-1245208.81

Item 4: Mortar, 81mm, ejection (empty), MD, located at Northing-321340.80, Easting-1245208.81

Item 5: Bomb fuze, MK 348, possible MEC, located at Northing-321329.30, Easting-1245224.38

Item 6: Bomblet, BLU-3, possible MEC, located at Northing-321322.01, Easting-1245195.15

Item 7: Submunition, BLU-7 (empty), marked “INERT”, MD, located at Northing-321340.80, Easting-1245208.81

Item 8: Submunition, M-38, possible MEC, located at Northing-321345.94, Easting-1245202.67

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Item 9: Bomb fin assembly base, snake eye fins, MD, located at Northing-321351.06, Easting-1245194.70

Item 10: Fuze booster cup (empty), MD, located at Northing-321348.29, Easting-1245193.46

Item 11: Projectile, 5” (empty), MD, located at Northing-321351.86, Easting-1245192.67

Item 12: Projectile nose-plug, MD, located at Northing-321354.99, Easting-1245196.49

No violations or discrepancies noted. Schonstedts, Whites XLT and GPS units were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mostly cloudy, high of 55F, low of 37F, winds mostly NE up to9 mph.	IMPORTANT TELEPHONE CALLS: MEC Notifications to Nick Carros and Ralph Brooks

PERSONNEL ON SITE: 5 UXO personnel, 1 Site Manager, 1 Project Geophysicist

Prepared by: Scott Roberts, SUXOS DATE: 12/02/09, Wednesday

TETRA TECH NUS, INC.

DATE	12/03/09
NO.	14
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present, In addition Site Manager Craig Irland and Project Geophysicist Jim Coffman are present. Commo, Schonstedt, Whites XLT and equipment checks were good. GPS accuracy was verified.

Geophysical data collection was completed in the EOD School Demolition Area 100% section.

Transect 11 failed QC Schonstedt check yesterday, it was re-swept with Schonstedt today.

Schonstedt and Whites XLT sweep performed on a total of 50% of the Advanced IED Area 100% section. Located 3 items, classification pending.

Items located in the Advanced IED Area transects which have been classified are:

Item 1, transect 19: Bomb fuze parts, MD, located at Northing-321671.06, Easting-1245438.57

Item 2, transect 19: Rocket Motor (empty), MD, located at Northing-321628.20, Easting-1245451.91

Item 3, transect 19: Bomb fuze parts, MD, located at Northing-321596.39, Easting-1245437.55

Item 4, transect 17: Bomb fuze parts, MD, located at Northing-321792.36, Easting-1245342.92

Item 5, transect 17: Bomblet, BLU-3, possible MEC, located at Northing-321789.19, Easting-1245339.76

Item 6, transect 17: Bomb fuze parts, MD, located at Northing-321791.31, Easting-1245338.60

Item 7, transect 17: Bomb fuze parts, MD, located at Northing-321784.90, Easting-1245334.30

Item 8, transect 17: Bomb fuze parts, MD, located at Northing-321773.95, Easting-1245340.66

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Item 9, transect 17: Firing Device, MD, located at Northing-321776.01, Easting-1245340.56

Item 10, transect 17: Bomblet, BLU-3, possible MEC, located at Northing-321772.87, Easting-1245332.94

Item 11, transect 17: Frag, 30mm, MD, located at Northing-321765.69, Easting-1245334.04

Item 12, transect 17: Bomb fuze parts, MD, located at Northing-321772.49, Easting-1245334.24

Item 13, transect 17: Bomb fuze booster cup assembly, MD, located at Northing-321743.42, Easting-1245325.01

Classification of items on transects and in the 100% coverage section of the Advanced IED Area is ongoing.

No violations or discrepancies noted. Schonstedts, Whites XLT and GPS units were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mostly sunny, high of 61F, low of 34F, winds mostly WSW up to14 mph.	IMPORTANT TELEPHONE CALLS: Seth Berry, regarding MEC notifications. Thomas A. Wright, regarding MEC notifications. Billy Fabey, regarding MEC notification. Navy On-Site Representative Nick Carros was not available; the above persons were listed as alternate contacts.
PERSONNEL ON SITE: 5 UXO personnel, 1 Site Manager, 1 Project Geophysicist	
Prepared by: Scott Roberts, SUXOS	DATE: 12/03/09, Thursday

TETRA TECH NUS, INC.

DATE	12/04/09
NO.	15
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area, EOD School Demolition Area Geophysical Data Collection

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel Site manager Craig Irland (demobilizing) and Project Geophysicist Jim Coffman are present. Commo, Schonstedt, Whites XLT and equipment checks were good. GPS accuracy was verified. One UXO T-3 will escort Geophysicist.

Geophysical data collection was completed in the EOD School Demolition Area transects.

Schonstedt and Whites XLT sweep performed on a total of 80% of the Advanced IED Area 100% section. All transects have now been swept with Schonstedts, 1-5 were done today.

Classification research of items on transects and in the 100% coverage section of the Advanced IED Area is ongoing.

No violations or discrepancies noted. Schonstedts, Whites XLT and GPS units were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 52F, low of 38F, winds mostly NNW up to5 mph.	IMPORTANT TELEPHONE CALLS: Navy On-Site Representative Nick Carros and Tetra Tech UXO Manager Ralph Brooks, MEC notification.

PERSONNEL ON SITE: 5 UXO personnel, 1 Site Manager (demobilized) 1 Project Geophysicist

Prepared by: Scott Roberts, SUXOS DATE: 12/04/09, Friday

TETRA TECH NUS, INC.

DATE	12/05/09
NO.	16
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area, EOD School Demolition Area, Torpedo Burial Site

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel and Project Geophysicist Jim Coffman are present. Commo, Schonstedt, Whites XLT and equipment checks were good. One UXO T-3 will escort Geophysicist. Glen Childers mobilized yesterday, began reading the Work Plan and Health and Safety plan today, then site familiarization and preparations to take the UXOSO/QCS position, Tom Yancey will then work with the UXO team.

Geophysical data collection preparations were made in the Torpedo Burial Site and some non-munitions debris locations were logged in EOD School Demolition Area.

Schonstedt and Whites XLT sweep performed on a total of 100% of the Advanced IED Area 100% section.

Classification research of items on transects and in the 100% coverage section of the Advanced IED Area is ongoing.

No violations or discrepancies noted. Schonstedt and Whites XLT were tested and verified at various times throughout the day and at the end of the day. Field ops ceased due to severe winter weather, all UXO personnel were given UXO identification refresher training and will perform admin and other assigned tasks for the remainder of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Rain and snow, high of 41F, low of 27F, winds mostly N up to 25 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist

Prepared by: Scott Roberts, SUXOS DATE: 12/05/09, Saturday

TETRA TECH NUS, INC.

DATE	12/06/09
NO.	17
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area, Torpedo Burial Site, EOD School Demolition Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel and Project Geophysicist Jim Coffman are present. Commo, Schonstedt, Whites XLT GPS and equipment checks were good. One UXO T-3 will escort Geophysicist.

Geophysical data collection was completed in the Torpedo Burial Site. Geophysical data collection was re-done using the 858 in the EOD School Demolition Area 100% coverage section, and will be re-done using the EM-61 tomorrow.

Whites XLT sweep performed on transects 1-10 of the Advanced IED Area. Transect 10 failed QC check, transect 11 will be swept and transect 10 will be re-swept with the Whites XLT tomorrow.

All MEC/MD items in the Advanced IED Area 100% coverage section have been photographed and logged. Total of 55 items, 9 possible MEC, 46 MD. There were 12 items logged prior to today.

Item 13: M-100 series bomb fuze parts, possible MEC, located at Northing-321439.76, Easting-1245274.92

Item 14: M-130 series bomb fuze parts, MD, located at Northing-321346.11, Easting-1245274.92

Item 15: M-100 series bomb fuze parts, MD, located at Northing-321352.66, Easting-1245255.07

Item 16: M-130 series bomb fuze parts, MD, located at Northing-321347.17, Easting-1245242.63

Item 17: M-100 series bomb fuze parts, MD, located at Northing-321321.49, Easting-1245234.82

Item 18: M-100 series bomb fuze parts, MD, located at Northing-321337.49, Easting-1245226.23

Item 19: Submunition,BLU-7, possible MEC, located at Northing-321340.95, Easting-1245220.66

Item 20: M-100 series bomb fuze parts, MD, located at Northing-321342.50, Easting-1245233.06

Item 21: Bomb fuze parts, MD, located at Northing-321330.05, Easting-1245234.22

Item 22: M-905 bomb fuze parts, MD, located at Northing-321326.54, Easting-1245223.87

Item 23: Unknown, MD, located at Northing-321330.32, Easting-1245214.84

Item 24: M-100 series bomb fuze parts, MD, located at Northing-321331.55, Easting-1245218.47

Item 25: M-100 series bomb fuze parts, MD, located at Northing-321341.30, Easting-1245198.19

Item 26: Bomb fuze parts, MD, located at Northing-321344.17, Easting-1245188.55

Item 27: Submunition, BLU-7, possible MEC, located at Northing-321356.89, Easting-1245194.75

Item 28: Submunition, BLU-7, possible MEC, located at Northing-321356.89, Easting-1245194.75

Item 29: M-100 series bomb fuze parts, MD, located at Northing-321362.21, Easting-1245209.00

Item 30: Fuze parts, MD, located at Northing-321357.98, Easting-1245218.48

Item 31: Fuze parts, MD, located at Northing-321365.58, Easting-1245225.13

Item 32: Fuze parts, MD, located at Northing-321344.10, Easting-1245173.15

Item 33: Unknown component, MD, Northing-321339.17, Easting-1245178.35

Item 34: M-100 series bomb fuze parts, MD, located at Northing-321307.47, Easting-1245189.95

Item 35: M-100 series bomb fuze parts, MD, located at Northing-321308.37, Easting-1245142.24

Item 36: Fuze vanes, MD, located at Northing-321488.59, Easting-1245143.03

Item 37: Rocket motor (empty), MD, located at Northing-321468.03, Easting-1245124.12

Item 38: Chaff dispenser, MD, located at Northing-321459.58, Easting-1245117.33

Item 39: Striker plate, BLU-3, MD, located at Northing-321443.26, Easting-1245096.86

Item 40: Fuze parts, MD, located at Northing-321325.89, Easting-1245089.32

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Item 41: M-100 series bomb fuze parts, MD, located at Northing-321311.77, Easting-1245052.17

Item 42: M-904 series bomb fuze parts, MD, located at Northing-321316.44, Easting-1245031.23

Item 43: M-904 series bomb fuze vanes, MD, located at Northing-321331.25, Easting-1245055.27

Item 44: M-100 series bomb fuze parts, MD, located at Northing-321327.62, Easting-1245040.20

Item 45: M-100 series bomb fuze parts, MD, located at Northing-321362.46, Easting-1245036.56

Item 46: M-100 series bomb fuze parts, MD, located at Northing-321358.62, Easting-1245035.49

Item 47: M-100 series bomb fuze parts, MD, located at Northing-321359.84, Easting-1245039.40

Item 48: Fuze parts, MD, located at Northing-321373.23, Easting-1245041.37

Item 49: Fuze parts, MD, located at Northing-321381.78, Easting-1245047.67

Item 50: M-103 series bomb fuze parts, MD, located at Northing-321423.55, Easting-1245047.18

Item 51: Fuze parts, MD, located at Northing-321437.22, Easting-1245043.05

Item 52: M-130 series bomb fuze parts, MD, located at Northing-321478.64, Easting-1245046.83

Item 53: Shaped charge cone, MD, located at Northing-321490.90, Easting-1245066.63

Item 54: M-100 series bomb fuze parts, MD, located at Northing-321490.94, Easting-1245078.57

Item 55: M-103 series bomb fuze parts, possible MEC, located at Northing-321498.66, Easting-1245087.76

No violations or discrepancies noted. GPS, Schonstedt and Whites XLT were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Sunny, high of 40F, low of 27F, winds mostly NNW up to 7 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist	

TETRA TECH NUS, INC.

Prepared by: Scott Roberts, SUXOS DATE: 12/06/09, Sunday

TETRA TECH NUS, INC.

DATE	12/07/09
NO.	18
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area, EOD School Demolition Area, Stump Neck Impact Area, Torpedo Casing Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel and Project Geophysicist Jim Coffman are present. Commo, Schonstedt, Whites XLT GPS and equipment checks were good. One UXO T-3 will escort Geophysicist.

Geophysical data collection was re-done using the EM-61 in the EOD School Demolition Area 100% coverage section. Preparation for geophysical data collection was completed in the Advanced IED Area 100% coverage section.

Whites XLT sweep has been performed on all 19 transects in the Advanced IED Area, Transect 11 was done and 10 was re-swept today.

Transects 20-22 were brush cut in the Stump Neck Impact Area, the UXO Team was able to cut approximately 400' to 500' of each transect.

Transect stakes 12-14 were set in the Torpedo Casing Disposal Area.

No violations or discrepancies noted, all operations visually observed were IAW the Work Plan. GPS, Schonstedt and Whites XLT were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Sunny, high of 40F, low of 27F, winds mostly NNW up to 7 mph.	IMPORTANT TELEPHONE CALLS: Sunbelt Rentals, Chris, for pump pick up. Off rent # 4536471. Dahlgren EOD unit phoned and notified us that they will be coming to the site tomorrow.

PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist

TETRA TECH NUS, INC.

Prepared by: Scott Roberts, SUXOS DATE: 12/07/09, Monday

TETRA TECH NUS, INC.

DATE	12/08/09
NO.	19
SHEET 1 OF 3	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area, Stump Neck Impact Area, Area 8

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel and Project Geophysicist Jim Coffman are present. Commo, Schonstedt, Whites XLT GPS and equipment checks were good. One UXO T-3 will escort Geophysicist.

Geophysical data collection was partially completed in the Advanced IED Area 100% coverage section using EM-61.

Advanced IED Area transect MEC and MD items were logged and photographed through 95% of transect 12.

Per request of Nick Carros the Navy on-site Representative, the Navy EOD unit from Dahlgren was on site, Geophysical data collection and other ops in the AIEDA ceased, UXO Team relocated.

Transects 16-19 were brush cut in the Stump Neck Impact Area, the UXO Team was able to cut approximately 400’ to 500’ of each transect.

UXO Team performed brush cutting operations in Area 8 in the vicinity of the Old Shot Hole.

Items logged and photographed in the AIEDA transects today are:

Item 14, transect 16: M-100 series bomb fuze parts, possible MEC, located at Northing-321439.76, Easting-1245274.92

Item 15, transect 16: Bomb fuze parts, MD, located at Northing-321739.15, Easting-1245279.01

Item 16, transect 15: Bomb fuze parts, MD, located at Northing-321286.44, Easting-1245242.73

Item 17, transect 15: Burster tube, MD, located at Northing-321299.71, Easting-1245236.12

Item 18, transect 14: Bomb fuze parts, MD, located at Northing-321238.52, Easting-1245202.13

Item 19, transect 14: Bomb fuze parts, MD, located at Northing-321235.21, Easting-1245189.16

Item 20, transect 14: Bomb fuze parts, MD, located at Northing-321249.28, Easting-1245188.23

Item 21, transect 14: Arming stem, MD, located at Northing-321257.69, Easting-1245188.45

Item 22, transect 14: Fuze, possible MEC, located at Northing-321255.82, Easting-1245190.73

Item 23, transect 14: Bomb fuze parts, MD, located at Northing-321258.75, Easting-1245195.66

Item 24, transect 14: Bomb fuze parts, MD, located at Northing-321282.02, Easting-1245185.26

Item 25, transect 14: Bomb fuze parts, possible MEC, located at Northing-321284.55, Easting-1245179.17

Item 26, transect 14: Bomb fuze parts, possible MEC, located at Northing-321301.97, Easting-1245190.74

Item 27, transect 14: Bomb fuze parts, MD, located at Northing-321642.87, Easting-1245214.32

Item 28, transect 14: Nose plug/cone, MD, located at Northing-321797.39, Easting-1245202.69

Item 29, transect 14: M-100 series bomb fuze parts, MD, located at Northing-321846.41, Easting-1245205.90

Item 30, transect 13: M-100 series bomb fuze parts, possible MEC, located at Northing-321826.37, Easting-1245139.41

Item 31, transect 13: Submunition, M-38, possible MEC, located at Northing-321742.10, Easting-1245148.68

Item 32, transect 13: Unknown component, MD, located at Northing-321307.38, Easting-1245150.57

Item 33, transect 13: M-100 series bomb fuze parts, possible MEC, located at Northing-321296.21, Easting-1245147.08

Item 34, transect 13: M-100 series bomb fuze parts, possible MEC, located at Northing-321292.77, Easting-1245149.87

Item 35, transect 13: Cartridge, .50 cal., fired, MD, located at Northing-321252.95, Easting-1245152.57

Item 36, transect 12: M-103 series bomb fuze parts, possible MEC, located at Northing-321498.73, Easting-1245081.26

Item 37, transect 13: M-100 series arming stem, MD, located at Northing-321731.93, Easting-1245091.26

No violations or discrepancies noted, all operations visually observed were IAW the Work Plan. GPS, Schonstedt and Whites XLT were tested and verified at various times throughout the day and at the end of the day.

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VISITORS ON SITE: Two EOD Technicians from Dahlgren.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Sunny, high of 40F, low of 27F, winds mostly NNW up to 7 mph.	IMPORTANT TELEPHONE CALLS: Susan Yates to schedule access to Range 3. Nick Carros for notification when Dahlgren EOD arrived on site.
PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist, 2 EOD Technicians from Dahlgren	
Prepared by: Scott Roberts, SUXOS	DATE: 12/08/09, Tuesday

TETRA TECH NUS, INC.

DATE	12/09/09
NO.	20
SHEET 1 OF 3	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Advanced IED Area, Stump Neck Impact Area, Torpedo Casing Disposal Area.

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel and Project Geophysicist Jim Coffman are present. Commo, Schonstedt, GPS and equipment checks were good. One UXO T-3 will escort Geophysicist.

Geophysical data collection was completed in the Advanced IED Area 100% coverage section using EM-61. Data collection of the same area, using the 858 will be performed on the Geophysicists next shift.

Transects 12-15 were brush cut in the Stump Neck Impact Area, the UXO Team was able to cut approximately 400' to 500' of each transect.

Transects 7-11 were staked in the Torpedo Casing Disposal Area.

All Advanced IED Area transect MEC and MD items were logged and photographed.

Items logged and photographed in the AIEDA transects today are:

Item 38, transect 12: Submunition, BLU-26, possible MEC, located at Northing-321830.14, Easting-1245092.09

Item 39, transect 12: Submunition, BLU-26 parts, MD, located at Northing-321830.14, Easting-1245092.09

Item 40, transect 12: Mk 348 bomb fuze, possible MEC, located at Northing-321840.10, Easting-124509.66

Item 41, transect 11: M-100 series bomb fuze parts, MD, located at Northing-321607.94, Easting-1245059.09

Item 42, transect 11: M-904 bomb fuze parts, MD, located at Northing-321452.95, Easting-1245032.29

Item 43, transect 11: M-100 series bomb fuze parts, MD, located at Northing-321359.84, Easting-1245039.40

Item 44, transect 11: M-100 series bomb fuze parts, MD, located at Northing-321358.62, Easting-1245035.49

Item 45, transect 11: M-100 series bomb fuze parts, MD, located at Northing-321286.08, Easting-1245037.82

Item 46, transect 10: M-904 bomb fuze vanes, MD, located at Northing-321321.99, Easting-1245003.00

Item 47, transect 10: M-905 bomb fuze parts, MD, located at Northing-321337.03, Easting-1245000.44

Item 48, transect 10: M-904 bomb fuze parts, MD, located at Northing-321333.65, Easting-1244992.11

Item 49, transect 10: Unknown bomb fuze parts, MD, located at Northing-321388.44, Easting-1245002.58

Item 50, transect 10: Unknown bomb fuze parts, MD, located at Northing-321397.29, Easting-1245003.54

Item 51, transect 10: Unknown bomb fuze parts, MD, located at Northing-321392.89, Easting-1244998.30

Item 52, transect 10: M-100 series bomb fuze parts, MD, located at Northing-321394.28, Easting-1244980.96

Item 53, transect 10: M-904 bomb fuze vanes, MD, located at Northing-321388.11, Easting-1244985.72

Item 54, transect 10: M-103 bomb fuze parts, MD, located at Northing-321594.20, Easting-1244982.54

Item 55, transect 10: M-48 fuze parts, MD, located at Northing-321615.83, Easting-1244992.11

Item 56, transect 10: M-48 fuze parts, MD, located at Northing-321615.83, Easting-1244992.11

Item 57, transect 09: BLU-7, possible MEC, located at Northing-321408.00, Easting-1244942.12

Item 58, transect 09: Unknown fuze parts, MD, located at Northing-321316.62, Easting-1244924.69

Item 59, transect 09: M-905 fuze parts, MD, located at Northing-321424.94, Easting-1244873.03

Item 60, transect 07: M-100 series fuze parts, MD, located at Northing-321525.74, Easting-1244839.50

Item 61, transect 07: Submunition BLU-7, possible MEC, located at Northing-321461.88, Easting-1244841.12

Item 62, transect 07: M-100 series arming stem, MD, located at Northing-321230.04, Easting-1244835.18

Item 63, transect 06: M-132 bomb fuze, possible MEC, located at Northing-321514.61, Easting-1244782.01

Item 64, transect 06: M-100 series fuze parts, MD, located at Northing-321556.49, Easting-1244793.02

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Item 65, transect 06: M-100 series fuze parts, MD, located at Northing-321570.60, Easting-1244785.14

Item 66, transect 05: M-100 series fuze parts, MD, located at Northing-321561.50, Easting-1244760.84

Item 67, transect 05: M-100 series fuze parts, MD, located at Northing-321350.78, Easting-1244740.82

Item 68, transect 05: M-100 series fuze parts, MD, located at Northing-321337.41, Easting-1244746.46

Item 69, transect 04: Submunition, BLU-7, possible MEC, located at Northing-321364.16, Easting-1244702.54

Item 70, transect 04: Submunition, BLU-7, possible MEC, located at Northing-321363.43, Easting-1244705.64

Item 71, transect 04: Submunition, BLU-7, possible MEC, located at Northing-321375.92, Easting-12444696.04

Item 72, transect 01: Mk 82 bomb casing, MD, located at Northing-321274.64, Easting-1244546.44

Totals for the Advanced IED Area 100% coverage section: 9 possible MEC, 46 MD. 55 items total.

Totals for Advanced IED Area transects: 20 possible MEC, 52 MD. 72 items total.

No violations or discrepancies noted, all operations visually observed were IAW the Work Plan. GPS and Schonstedt were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: Nick Carros, Navy on-site Representative	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, early morning rainfall, high of 54F, low of 34F, winds mostly SW up to 13 mph.	IMPORTANT TELEPHONE CALLS: Nick Carros for MEC notifications. Craig Irland for MEC notifications.

PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist, Nick Carros

Prepared by: Scott Roberts, SUXOS DATE: 12/09/09, Wednesday

TETRA TECH NUS, INC.

DATE	12/14/09
NO.	21
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Stump Neck Impact Area, Torpedo Casing Disposal Area.

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Schonstedt, GPS and equipment checks were good.

On Thursday 12/10 Nick Carros requested that the possible MEC items identified on 12/09 in the Advanced IED Area transects be marked with caution tape so that hunters would avoid them. UXOSO and one UXOT-3 traveled to the site and complied. The two inch pump was picked up by Sunbelt Rentals.

On Friday 12/11 SUXOS and UXOSO had to travel to the site to meet with two Navy EOD Technicians from Dahlgren and Nick Carros to locate our possible MEC items for them. The Navy EOD Technicians either disposed of the 8 possible MEC items we had identified on 12/09 in the AIEDA transects or determined that they were MD. Two items in the AIEDA 100% coverage section that they were not able to find on the last trip were also located, and while traveling between transects they visually located one BLU-7 marked “inert” approximately 100’ East of item 70 Transect 4. Total of 11 possible MEC items. Reports from Dahlgren EOD are pending on final disposition. The EOD Technicians staged some of the items they determined to be MD at SWMU-27 in the 100% coverage section in an ammo can.

Stump Neck Impact Area transects 02-22 have now been brush cut. Transects 2-12 swept with Schonstedts, no MEC or MD was located. Transect 1 is essentially in Chicamuxen creek.

Torpedo Casing Disposal Area was brush cut, transects 1-16 have been staked and Geophysical data collection lanes flagged. A 100% UXO coverage sweep of the area was performed with Schonstedts. No MEC or MD located.

No violations or discrepancies noted, all operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None

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WEATHER CONDITIONS: Cloudy, morning fog, high of 40F, low of 27F, winds mostly NNW up to 7 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel	
Prepared by: Scott Roberts, SUXOS	DATE: 12/14/09, Monday

TETRA TECH NUS, INC.

DATE	12/15/09
NO.	22
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Stump Neck Impact Area, Valley Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Schonstedt, GPS and equipment checks were good.

Stump Neck Impact Area transect stakes placed on 25-30, 1 and 31 are inaccessible by foot. Transects 13-22 were swept with Schonstedts, no MEC or MD located. Transects 23-30 were brush cut.

Valley Impact Area transect stakes were placed on 14-19, transects 1-13 are in the Range 3 safety arc and we do not have access at this time, possibly on Saturday.

While traveling to the Stump Neck Impact Area transects the UXO team visually located a pile of unfuzed ceramic Japanese Type-3 mines (MD, no filler) most were broken into pieces, but one was complete. Located at Northing-322739.94, Easting-1249068.01

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, morning fog, high of 56F, low of 29F, winds mostly W up to 9 mph.	IMPORTANT TELEPHONE CALLS: Sunbelt Rentals to replace a broken weedeater.

PERSONNEL ON SITE: 6 UXO personnel

Prepared by: Scott Roberts, SUXOS DATE: 12/15/09, Tuesday

TETRA TECH NUS, INC.

DATE	12/16/09
NO.	23
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Stump Neck Impact Area, Valley Impact Area	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Schonstedt, GPS and equipment checks were good.

Stump Neck Impact Area transect transects 23-30 were swept with Schonstedts.

Valley Impact Area transects 19-18 were brush cut. Sweep lanes flagged on transects 19-14.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Clear and sunny, high of 40F, low of 25F, winds mostly NW up to 10 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel	
Prepared by: Scott Roberts, SUXOS	DATE: 12/16/09, Wednesday

TETRA TECH NUS, INC.

DATE	12/17/09
NO.	24
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Area 8, Valley Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Schonstedt, GPS and equipment checks were good. Sunbelt Rentals replaced the broken weedeater and tuned up the other weedeater.

Area 8 pond was swept and GPS coordinates were logged for underwater anomaly locations. This was done now due to the possibility that the pond may be frozen when we mobilize after the holiday vacation period.

Valley Impact Area transects 17-15 were brush cut.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: Joe Rail, Navy RPM.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Clear and sunny, high of 40F, low of 23F, winds mostly NNW up to 11 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 6 UXO personnel

Prepared by: Scott Roberts, SUXOS DATE: 12/17/09, Thursday

TETRA TECH NUS, INC.

DATE	12/18/09
NO.	25
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Area 8, Valley Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Schonstedt, GPS and equipment checks were good.

The weedeater that was taken off site yesterday by Chris with Sunbelt for a tune-up has not been returned, but will be brought back to the site on 1/04/10 we could possibly get a gas-powered hedge trimmer as well.

Area 8 portion of Chicamuxen Creek was swept and GPS coordinates were logged for underwater anomaly locations. This was done now due to the possibility that the creek may be frozen when we mobilize after the holiday vacation period.

Valley Impact Area transect 14 was brush cut. Transects 19-14 were swept with Schonstedt. No MEC or MD located.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, high of 36F, low of 23F, winds mostly E up to 5 mph.	IMPORTANT TELEPHONE CALLS: Sunbelt Rentals, Rick Coleman, all rental equipment will be off rent from 12/20/09-01/03/10.

PERSONNEL ON SITE: 6 UXO personnel

Prepared by: Scott Roberts, SUXOS DATE: 12/18/09, Friday

TETRA TECH NUS, INC.

DATE	12/18/09
NO.	25
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Area 8, Valley Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Schonstedt, GPS and equipment checks were good.

The weedeater that was taken off site yesterday by Chris with Sunbelt for a tune-up has not been returned, but will be brought back to the site on 1/04/10 we could possibly get a gas-powered hedge trimmer as well.

Area 8 portion of Chicamuxen Creek was swept, 13 anomalies located and GPS coordinates were logged for underwater anomaly locations. This was done now due to the possibility that the creek may be frozen when we mobilize after the holiday vacation period.

Valley Impact Area transect 14 was brush cut. Transects 19-14 were swept with Schonstedt. No MEC or MD located.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, high of 36F, low of 23F, winds mostly E up to 5 mph.	IMPORTANT TELEPHONE CALLS: Sunbelt Rentals, Rick Coleman, all rental equipment will be off rent from 12/20/09-01/03/10.

PERSONNEL ON SITE: 6 UXO personnel

Prepared by: Scott Roberts, SUXOS DATE: 12/18/09, Friday

TETRA TECH NUS, INC.

DATE	12/18/09
NO.	25
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Area 8, Valley Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all UXO personnel present. Commo, Schonstedt, GPS and equipment checks were good.

The weedeater that was taken off site yesterday by Chris with Sunbelt for a tune-up has not been returned, but will be brought back to the site on 1/04/10 we could possibly get a gas-powered hedge trimmer as well.

Area 8 portion of Chicamuxen Creek was swept, 13 anomalies located and GPS coordinates were logged for underwater anomaly locations. This was done now due to the possibility that the creek may be frozen when we mobilize after the holiday vacation period.

Valley Impact Area transect 14 was brush cut. Transects 19-14 were swept with Schonstedt. No MEC or MD located.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, high of 36F, low of 23F, winds mostly E up to 5 mph.	IMPORTANT TELEPHONE CALLS: Sunbelt Rentals, Rick Coleman, all rental equipment will be off rent from 12/20/09-01/03/10.

PERSONNEL ON SITE: 6 UXO personnel

Prepared by: Scott Roberts, SUXOS DATE: 12/18/09, Friday

TETRA TECH NUS, INC.

DATE	01/04/10
NO.	26
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Valley Impact Area, Air Blast Pond, GPS Training

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, project UXO personnel and Site Manager Craig Irland mobilized yesterday after holiday and are present. Glen Childers was reassigned to a different job. Tom Yancey will be UXOSO/QCS. Mark Soha is working at another job-site, possibly thru this week but will return when the job is completed. There's a new UXOT-1 on site, Alfred Smith, he will read the WP and HASP then site familiarization with UXOSO/QCS before starting ops. Jim Coffman, Project Geophysicist is mobilizing to the site today. GPS units, Schonstedts and Whites XLT were tested and passed.

Sunbelt Rentals delivered a Stihl model FS 110 weedeater, serial # 136297 and a Stihl gas powered hedge trimmer model HS 80 serial # 88581 to the site this morning.

UXO team performed a Whites sweep of Valley Impact Area transects 14 and 15. These two transects enter the Advanced IED Area (where aluminum MEC/MD anomalies were located). The remaining Valley Impact Area transects will be swept with Schonstedts only due to historical data, unless aluminum anomalies are visually located.

UXO team brush cut at Air Blast Pond. Completed approximately 10% of remaining required. Total of 60% completed.

All personnel returned to the hotel for GPS training from 1330 until 1830 due to a change/update to GPS programming.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts and Whites XLT were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 34F, low of 21F, winds mostly NW up to 22 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 5 UXO personnel, 1 Site Manager

TETRA TECH NUS, INC.

Prepared by: Scott Roberts, SUXOS DATE: 01/04/10, Monday

TETRA TECH NUS, INC.

DATE	01/05/10
NO.	27
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Valley Impact Area, Area 8, Stump Neck Impact Area Geophysical Data Collection

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 5 UXO personnel, Project Geophysicist and Site Manager Craig Irland are present. GPS units, Schonstedts and Whites XLT were tested and passed.

UXO team identified anomalies located previously in Valley Impact Area transects 14 and 19.

VIA-T-19-01 Submunition, BLU-3, possible MEC located at Northing-322500.10, Easting-1246507.53

VIA-T-19-02 Projectile, 105mm, MD, located at Northing-322445.48, Easting-1246473.15

VIA-T-14-03 Submunition, BLU-7, possible MEC, located at Northing-321392.42, Easting-1244767.42

VIA-T-14-04 Bomb fuze arming vane, MD, located at Northing-321218.40, Easting-1245028.11

VIA-T-14-05 Bomb fuze arming vane, MD, located at Northing-321208.01, Easting-1245032.69

VIA-T-14-06 Bomb fuze arming vane, MD, located at Northing-321196.12, Easting-1245049.60

VIA-T-14-07 Bomb fuze, MD, located at Northing-321201.55, Easting-1245056.72

UXO team marked areas encompassing 17 water shot locations in Area 8.

Project Geophysicist performed geophysical data collection in Stump Neck Impact Area transects.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts and Whites XLT were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None

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WEATHER CONDITIONS: Partly cloudy, high of 36F, low of 25F, winds mostly WNW up to 13 mph.	IMPORTANT TELEPHONE CALLS: Nick Carros, MEC notification
PERSONNEL ON SITE: 5 UXO personnel, 1 Site Manager, 1 Project Geophysicist	
Prepared by: Scott Roberts, SUXOS	DATE: 01/05/10, Tuesday

TETRA TECH NUS, INC.

DATE	01/06/10
NO.	28
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Area 8, Stump Neck Impact Area Geophysical Data Collection

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 5 UXO personnel, Project Geophysicist and Site Manager Craig Irland are present. GPS units, Schonstedts and Whites XLT were tested and passed.

UXO team marked all areas encompassing water shot locations in Area 8.

Project Geophysicist completed geophysical data collection in Stump Neck Impact Area transects.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts and Whites XLT were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 36F, low of 25F, winds mostly WNW up to 13 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 5 UXO personnel, 1 Site Manager, 1 Project Geophysicist

Prepared by: Scott Roberts, SUXOS DATE: 01/06/10, Wednesday

TETRA TECH NUS, INC.

DATE	01/07/10
NO.	29
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Area 8, Torpedo Casing Disposal Area, Valley Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 5 UXO personnel, and Project Geophysicist are present. GPS units, Schonstedts and Whites XLT were tested and passed. One UXO T-3 will escort Project Geophysicist. Communications and equipment checks were good.

UXO team marked areas encompassing Air Shot locations in Area 8. Marking sweep areas in Area 8 is 95% completed.

UXO Team cut and swept the southern swampy portions of transects 14, 15 and 16. Transect 17 southern portion was inaccessible. These transects were not cut and swept prior to today due to a misunderstanding on my part in regards to Geophysical Data collection in this area not being performed because of proximity to the Advanced IED Area.

An SUU-14 submunition dispenser, still containing some submunitions (possibly BLU-3, BLU-17 or BLU-24), was located on VIA T-15-08 at Northing-321420.52, Easting-1245389.61

Project Geophysicist completed geophysical data collection in Torpedo Casing Disposal Area transects and Valley Impact Area transects 19, 18 and 16.

UXO T-3 Mark Soha arrived at the site at 1400, briefed by UXOSO, began escorting Project Geophysicist.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts and Whites XLT were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: Joe Rail, Navy RPM	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 36F, low of 25F, winds mostly WNW up to 13 mph.	IMPORTANT TELEPHONE CALLS: MEC notification for Site Manager Craig Irland. UXOSO will email Nick Carros to notify.

PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist, Joe Rail Navy RPM

TETRA TECH NUS, INC.

Prepared by: Scott Roberts, SUXOS DATE: 01/07/10, Thursday

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FIELD ACTIVITY DAILY LOG

DATE	01/08/10
NO.	30
SHEET 1 OF 2	

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Valley Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel, and Project Geophysicist are present. GPS units and Schonstedts were tested and passed. One UXO T-3 will escort Project Geophysicist.

UXO team set and marked transects 1-12 in the Valley Impact Area, transects 1-6 and 8-10 were swept with Schonstedt. The UXO Team located 2 MD items in transect 6 and 5 MD items in transect 10.

VIA T-10-09 is part of a MK 81 bomb, MD at Northing-320031.75, Easting-1243840.99

VIA T-10-10 is a MK 81 practice bomb, MD at Northing-320031.75, Easting-1243840.99

VIA T-10-11 is an 8” projectile, MD at Northing-320031.75, Easting-1243840.99

VIA T-10-12 is an 8” projectile, MD at Northing-320031.75, Easting-1243840.99

VIA T-10-13 is an 8” projectile, MD at Northing-320031.75, Easting-1243840.99

VIA T-06-14 is an old style bomb, MD at Northing-318609.35, Easting-1242920.09

VIA T-06-15 is an old style bomb, MD at Northing-318609.35, Easting-1242920.09

Project Geophysicist performed geophysical data collection in Valley Impact Area transects 17, 15, 14, 1, 2 and 3 excluding the portions of transects 14 and 15 that went through the Advanced IED Area.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

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The Whites XLT will not be used for Valley Impact Area transects other than those it has already been used for due to the fact that munitions we have already located and expect to locate are ferrous metal and we have not visually located any non ferrous metal munitions or parts in any of the transects.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: After work yesterday I rented a 4x4 pick-up truck from Enterprise, one month rental, to support UXO team ops.
WEATHER CONDITIONS: Partly cloudy, high of 29F, low of 18F, winds mostly WNW up to 14 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist	
Prepared by: Scott Roberts, SUXOS	DATE: 01/08/10, Friday

TETRA TECH NUS, INC.

DATE	01/08/10
NO.	30
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Valley Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel, and Project Geophysicist are present. GPS units and Schonstedts were tested and passed. One UXO T-3 will escort Project Geophysicist.

UXO team set and marked transects 1-12 in the Valley Impact Area, transects 1-6 and 8-10 were swept with Schonstedt. The UXO Team located 3 MD items in transect 6 and 5 MD items in transect 10.

VIA T-10-09 is part of a MK 81 bomb, MD at Northing-320031.75, Easting-1243840.99

VIA T-10-10 is a MK 81 practice bomb, MD at Northing-320031.75, Easting-1243840.99

VIA T-10-11 is an 8” projectile, MD at Northing-320031.75, Easting-1243840.99

VIA T-10-12 is an 8” projectile, MD at Northing-320031.75, Easting-1243840.99

VIA T-10-13 is an 8” projectile, MD at Northing-320031.75, Easting-1243840.99

VIA T-06-14 is an old style bomb, MD at Northing-318609.35, Easting-1242920.09

VIA T-06-15 is an old style bomb, MD at Northing-318609.35, Easting-1242920.09

VIA T-06-16 is an old style bomb, MD at Northing-318609.35, Easting-1242920.09

Project Geophysicist performed geophysical data collection in Valley Impact Area transects 17, 15, 14, 1, 2 and 3 excluding the portions of transects 14 and 15 that went through the Advanced IED Area.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

The Whites XLT will not be used for Valley Impact Area transects other than those it has already been used for due to

TETRA TECH NUS, INC.

the fact that munitions we have already located and expect to locate are ferrous metal and we have not visually located any non ferrous metal munitions or parts in any of the transects.	
VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: After work yesterday I rented a 4x4 pick-up truck from Enterprise, one month rental, to support UXO team ops.
WEATHER CONDITIONS: Partly cloudy, high of 29F, low of 18F, winds mostly WNW up to 14 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist	
Prepared by: Scott Roberts, SUXOS	DATE: 01/08/10, Friday

TETRA TECH NUS, INC.

DATE	01/09/10
NO.	31
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex

PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Valley Impact Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel, and Project Geophysicist are present. GPS units and Schonstedts were tested and passed. One UXO T-3 will escort Project Geophysicist.

UXO team set and marked transect 13 in the Valley Impact Area, transects 7 and 11-13 were brush cut and swept with Schonstedt. Two MD items located on T-7:

VIA T-07-17 is an M-100 series bomb fuze, MD at Northing-319340.06, Easting-1242802.11

VIA T-07-18 is a M-100 series bomb fuze, MD at Northing-319351.52, Easting-1242787.69

Project Geophysicist performed geophysical data collection in Valley Impact Area transects 4-13. If geophysical data is good, all ops in Valley Impact Area have been completed.

UXO Team completed marking Area 8 Air Shot locations to be swept.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 34F, low of 18F, winds mostly NNW up to 12 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist

Prepared by: Scott Roberts, SUXOS DATE: 01/09/10, Saturday

TETRA TECH NUS, INC.

DATE	01/10/10
NO.	32
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Area 8

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel, and Project Geophysicist are present. GPS units, Whites XLT and Schonstedts were tested and passed. Project Geophysicist informed me that the Valley Impact Area geophysical data was good, he will not be traveling to the job-site and is demobilizing this morning.

UXO Team brush cut and swept 25% of Area 8 Air Shot locations.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 34F, low of 18F, winds mostly NNW up to 12 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 6 UXO personnel, 1 Project Geophysicist (demobilized)

Prepared by: Scott Roberts, SUXOS DATE: 01/10/10, Sunday

TETRA TECH NUS, INC.

DATE	01/11/10
NO.	33
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Basic IED Area, Air Blast Pond	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel present. GPS units, Whites XLT and Schonstedts were tested and passed.

UXO Team set and marked all 8 transects in the Basic IED Area.

UXO Team Brush cut in Air Blast Pond. Brush cutting is 80% completed.

The down-hole magnetometer was sent via Fed-Ex back to the Site Manager per request.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 36F, low of 25F, winds mostly SWW up to 5 mph.	IMPORTANT TELEPHONE CALLS: Pine Environmental for boat and associated gear to be returned. Sunbelt Rentals, chainsaw was replaced. The clutch was bad there will be a service charge for the exchange.
PERSONNEL ON SITE: 6 UXO personnel	
Prepared by: Scott Roberts, SUXOS	DATE: 01/11/10, Monday

TETRA TECH NUS, INC.

DATE	01/12/10
NO.	34
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Basic IED Area, MC Sampling

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel present. GPS units, Whites XLT and Schonstedts were tested and passed.

Tetra Tech Project Manager Ralph Basinski and MC sampler Terry Rojahn are on site to plan and coordinate MC sampling activities. UXOSO provided a safety briefing. I will escort them to the various sites where MC sampling is scheduled to be performed.

UXO Team brush cut transects and the 100% coverage section in the Basic IED Area. Brush cutting is 50% completed.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: Ralph Basinski, Tetra Tech PM. Terry Rojahn for MC Sampling.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 36F, low of 22F, winds mostly NNW up to 13 mph.	IMPORTANT TELEPHONE CALLS: Pine Environmental to cancel boat pick-up, per R. Basinski.

PERSONNEL ON SITE: 6 UXO personnel, 1 Project Mgr, 1 MC sampler

Prepared by: Scott Roberts, SUXOS DATE: 01/12/10, Tuesday

TETRA TECH NUS, INC.

DATE	01/13/10
NO.	35
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Area 8, Air Blast Pond	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good.

UXO Team brush cut in the Air Blast Pond. Brush cutting is 100% completed in Air Blast Pond.

UXO Team swept 25 % of areas encompassing water shot locations in Area 8 using Schonstedt and Whites XLT, and 10% of Air Blast Pond.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: Joe Rail, Navy RPM	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 40F, low of 23F, winds mostly W up to 7 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel, 1 Navy RPM	
Prepared by: Scott Roberts, SUXOS	DATE: 01/13/10, Wednesday

TETRA TECH NUS, INC.

DATE	01/18/10
NO.	36
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Area 8

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good.

UXOT-3 M. Soha demobilized the site at 1230.

UXO Team swept 60% of remaining areas encompassing water shot and air shot locations in Area 8 using Schonstedt and Whites XLT. One MD item located: Area 8-01, Chemical switch/horn for a sea mine, filled with plaster of paris, MD, at Northing-321444.84, Easting-1250565.52

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 52F, low of 34F, winds mostly NNW up to 12 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel	
Prepared by: Scott Roberts, SUXOS	DATE: 01/18/10, Monday

TETRA TECH NUS, INC.

DATE	01/19/10
NO.	37
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Air Blast Pond, MC Sampling, Area 8	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 5 UXO personnel, 2 MC samplers present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. One UXOT-3 will escort MC samplers.

One MD item identified from yesterdays Area 8 sweeps: Area 8-02, Chemical switch/horn for a sea mine, filled with plaster of paris, MD, at Northing-321231.42, Easting-1250899.52

UXO Team swept 50% of remaining Air Blast Pond area. Total of 60% completed.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 50F, low of 34F, winds mostly SW up to 6 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 5 UXO personnel, 2 MC Sampling personnel	
Prepared by: Scott Roberts, SUXOS	DATE: 01/19/10, Tuesday

TETRA TECH NUS, INC.

DATE	01/20/10
NO.	38
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: Air Blast Pond, MC Sampling	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 5 UXO personnel, 2 MC samplers present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. One UXOT-3 will escort MC samplers.

UXO Team swept 30% of remaining Air Blast Pond area, 90% completed.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, high of 45F, low of 31F, winds mostly N up to 6 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 5 UXO personnel, 2 MC Sampling personnel	
Prepared by: Scott Roberts, SUXOS	DATE: 01/20/10, Wednesday

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FIELD ACTIVITY DAILY LOG

DATE	01/21/10
NO.	39
SHEET 1 OF 2	

Comment [e1]:

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Air Blast Pond, Basic IED Area, MC Sampling, Area 8

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel, 2 MC samplers present. UXOT-3 Bruce Carnal mobilized yesterday, will read the site Work Plan and HASP this morning, then site familiarization and orientation with UXOSO/QCS. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. One UXOT-3 will escort MC samplers.

While supporting MC sampling, the UXOT-3 visually located a large fragment of a 500 lb old style bomb near but outside of the EOD School Demolition Area boundary. For reporting purposes it is ESDA-03 located at Northing-322837.76, Easting-1249380.95

UXO Team swept 10% of remaining Air Blast Pond area, 100% completed. One MD item located, Air Blast Pond-01, possibly part of a torpedo or underwater mine, located at Northing-322847.86, Easting-1248262.99

UXO Team swept transects 8, 7 and about half of transect 6 in Basic IED Area using Schonstedt and Whites XLT. Located 9 MD items.

BIEDA T-6-1 was apparently an MD collection point, it is a pile of 2.75” rocket motor fins and fuze parts located at Northing-322213.90, Easting-1246065.18

BIEDA T-8-2 is part of an M-10 anti-tank mine, training, MD, located at Northing-322337.57, Easting-1246121.15

BIEDA T-8-3 is 81mm mortar base (ejection), MD, located at Northing-322280.13, Easting-1246161.25

BIEDA T-7-4 is an expended fuze, Mechanical Time, MD, located at Northing-322128.63, Easting-1246112.67

BIEDA T-7-5 is a MK-230 depth bomb fuze, marked “empty”, MD, located at Northing-322304.15, Easting-1246112.51

BIEDA T-7-6 is a bomb fuze cutaway for training, MD, located at Northing-322310.62, Easting-1246112.36

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BIEDA T-7-7 is a bomb fuze arming stem, MD, located at Northing-322308.12, Easting-1246116.49

BIEDA T-7-8 is an 81mm mortar marked “inert” no fuze, MD, located at Northing-322322.04, Easting-1246098.39

BIEDA T-7-9 is a 75mm projectile, expended, probably a low-order detonation, no fuze, MD, located at Northing-322349.63, Easting-1246106.96

In Area 8 while performing QC sweeps the UXOSO/QC located Area8-03, a torpedo exploder, possible MEC, just outside of the UXO Team sweep area. Located at coordinates: Northing-321515.12, Easting-1250524.60

The Navy EOD unit from Dahlgren sent two Technicians to the site today to inspect the possible MEC items that were located during the Valley Impact Area sweeps; The EOD Technicians disposed of the following items by detonation on Range 3: BLU-7 (VIA-T14-03), SUU-14 dispenser w/submunitions (VIA-T15-08). They determined that BLU-3 (VIA-T19-01) was a training item and placed it in the ammo can at SWMU-27 and they took the torpedo exploder and gave it to Stump Neck’s disassembly facility, P.O.C. is Mr. Dave Gill.

UXO Team swept in Area 8 using Schonstedts and Whites XLT, Area8 is approximately 85% completed.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: Two EOD Techs from Dahlgren, Joe Rail Navy RPM	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, high of 38F, low of 32F, winds mostly ENE up to 6 mph.	IMPORTANT TELEPHONE CALLS: Nick Carros for notification of Dahlgren EOD arrival.

PERSONNEL ON SITE: 6 UXO personnel, 2 MC Sampling personnel, 2 EOD Technicians from Dahlgren, Joe Rail, Navy RPM

Prepared by: Scott Roberts, SUXOS DATE: 01/21/10, Thursday

TETRA TECH NUS, INC.

DATE	01/22/10
NO.	40
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: MC Sampling, Area 8	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel, 1 MC sampler present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. One UXOT-3 will escort MC samplers.

UXO Team swept in Area 8 using Schonstedts and Whites XLT, Area 8 is approximately 95% completed.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Intermittent rain/sleet, high of 40F, low of 29F, winds mostly N up to 9 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel, 1 MC Sampler	
Prepared by: Scott Roberts, SUXOS	DATE: 01/22/10, Friday

TETRA TECH NUS, INC.

DATE	01/23/10
NO.	41
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: MC Sampling, Area 8

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 7 UXO personnel, 2 MC samplers present. UXOT-3 M. Soha is back on site. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. One UXOT-3 will escort MC samplers.

UXO Team swept in Area 8 using Schonstedts and Whites XLT, Area 8 is 100% completed. Anomaly clusters (ferrous metal) will be identified as such in GPS data. Eight MD items located:

Area 8-04 is part of an M-904 bomb fuze, MD, located at Northing-320745.61, Easting-1250692.87

Area 8-05 is part of an M-904 bomb fuze, MD, located at Northing-320727.48, Easting-1250608.61

Area 8-06 is a projectile fuze M-48 series, expended, MD, located at Northing-320730.13, Easting-1250557.82

Area 8-07 is a base plate, projectile, MD, located at Northing-320807.50, Easting-1250534.34

Area 8-08 is an extender cover for a sea mine, MD, located at Northing-320821.90, Easting-1250569.20

Area 8-09 is part of a rocket motor, empty, MD, located at Northing-320786.95, Easting-1250624.97

Area 8-10 is an extender cover for a sea mine, MD, located at Northing-321496.76, Easting-1250973.08

Area 8-11 is a projectile, 105mm, white phosphorous, empty, MD, located at Northing-321000.22 , Easting-1250461.19

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None

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WEATHER CONDITIONS: Sunny, high of 44F, low of 28F, winds mostly NE up to 5 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 7 UXO personnel, 2 MC Sampler	
Prepared by: Scott Roberts, SUXOS	DATE: 01/23/10, Saturday

TETRA TECH NUS, INC.

DATE	01/24/10
NO.	42
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: MC Sampling, Basic IED Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 7 UXO personnel, 2 MC samplers present. UXOT-3 M. Soha demobilized at 1430. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. One UXOT-3 will escort MC samplers.

UXO Team swept in Basic IED Area using Schonstedts and Whites XLT. Five MD items located. Numerous subsurface anomalies.

BIEDA-T- 6-10 is a 2.25" sub-caliber aircraft rocket motor (SCAR), MD, located at Northing-322181.85, Easting-1246069.34

BIEDA-T- 6-11 is part of an M-100 series bomb fuze, MD, located at Northing-322193.66, Easting-1246059.85

BIEDA-T- 6-12 is a fuze booster cup, empty, MD, located at Northing-322217.72, Easting-1246059.26

BIEDA-T- 6-13 is a fuze booster cup, empty, MD, located at Northing-322223.76, Easting-1246064.73

BIEDA-T- 6-14 is a fuze, possibly M-9, MD, located at Northing-322299.80, Easting-1246001.43

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, intermittent light rain, high of 39F, low of 34F, winds mostly ESE up to 11 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 7 UXO personnel, 2 MC Samplers

Prepared by: Scott Roberts, SUXOS DATE: 01/24/10, Sunday

TETRA TECH NUS, INC.

DATE	01/25/10
NO.	43
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: MC Sampling, Basic IED Area

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel, 2 MC samplers present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. One UXOT-3 will escort MC samplers.

Site Manager approved the addition of two more transects, 9 and 10, to the Basic IED Area because of the number of MD items located on transects 7 and 8.

UXO Team swept in Basic IED Area using Schonstedts and Whites XLT. Eight MD items located:

BIEDA-T-3-15 is a Mine, M-3, MD, located at Northing-322322.90, Easting-1245937.68

BIEDA-T-3-16 is a Booster cup, MD, located at Northing-322331.85, Easting-1245905.21

BIEDA-T-2-17 is a Mine, M-14, staged, marked “Inert”, MD, located at Northing-322339.75, Easting-1245867.63

BIEDA-T-2-18 is a Firing device, M-5, MD, located at Northing-322408.96, Easting-1245867.61

BIEDA-T-1-19 is a Mine, M-3, w/firing device, MD, located at Northing-322429.02, Easting-1245811.54

BIEDA-T-9-20 is a Fuze, landmine, MD, located at Northing-322318.22, Easting-1246207.54

BIEDA-T-10-21 is a Projectile, 75mm shrapnel, empty, fired, MD, located at Northing-322341.65, Easting-1246284.40

BIEDA-T-10-22 is a Firing device, M-1, MD, located at Northing-322074.58, Easting-1246273.04

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: Two

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	transects added to Basic IED Area, Eastern edge.
WEATHER CONDITIONS: Cloudy, intermittent rain, high of 61F, low of 34F, winds mostly ESE up to 11 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel, 2 MC Samplers	
Prepared by: Scott Roberts, SUXOS	DATE: 01/25/10, Monday

TETRA TECH NUS, INC.

DATE	01/26/10
NO.	44
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: MC Sampling, Basic IED Area 100% section

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel, 2 MC samplers present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. One UXOT-3 will escort MC samplers.

UXO Team swept in Basic IED Area 100% coverage section using Schonstedts and Whites XLT. No MEC or MD items located. The area is approximately 70% completed. Numerous sub-surface anomalies and surface debris noted.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, high of 48F, low of 30F, winds mostly WSW up to 20 mph.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 6 UXO personnel, 2 MC Samplers

Prepared by: Scott Roberts, SUXOS DATE: 01/26/10, Tuesday

TETRA TECH NUS, INC.

DATE	01/27/10
NO.	45
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: MC Sampling, Basic IED Area 100% section, Test area 1

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 6 UXO personnel, 2 MC samplers present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. One UXOT-3 will escort MC samplers.

UXO Team swept in Basic IED Area 100% coverage section using Schonstedts and Whites XLT. Two MD, no MEC items located. The area is 100% completed. Numerous sub-surface anomalies and surface debris noted.

BIEDA-01 is a Firing device, M-142, expended, MD, located at Northing-321991.44, Easting-1246049.68

BIEDA-02 is a Bomb, 250lb practice, MD, located at Northing-322089.81, Easting-1246097.78

UXO Team relocated to Test Area 1 and cut brush.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: Nick Carros, Navy on-site Rep.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Partly cloudy, high of 44F, low of 32F, winds mostly WSW up to 20 mph.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO personnel, 2 MC Samplers	
Prepared by: Scott Roberts, SUXOS	DATE: 01/27/10, Wednesday

TETRA TECH NUS, INC.

DATE	02/02/10
NO.	47
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810
FIELD ACTIVITY SUBJECT: MC Sampling, Test Area 1	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 7 UXO personnel and 3 MC samplers present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. Two UXOT-3's will escort the two MC sampling teams and will stay on site, if necessary, after UXO Team departs.

UXO Team swept 50% of Test Area 1 with Schonstedts and Whites XLT. Test Area 1 is 70% completed.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Mostly cloudy, high of 39F, low of 24F, winds mostly ESE up to 5 mph. 3-6 inches of snow on the ground, intermittent PM snow/sleet.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 7 UXO personnel, 3 MC samplers	
Prepared by: Scott Roberts, SUXOS	DATE: 02/02/10, Tuesday

TETRA TECH NUS, INC.

DATE	02/03/10
NO.	48
SHEET 1 OF 2	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: MC Sampling, Test Area 1

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 7 UXO personnel and 3 MC samplers present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. Two UXOT-3's will escort the two MC sampling teams as necessary.

Mr. Craig Ulrich from Enviroscan arrived on-site at 11:50 to check for utilities at sites where the sampling Geo-Probe will be used. One UXOT-3 will provide UXO escort.

UXO Team swept 30% of Test Area 1 with Schonstedts and Whites XLT. Test Area 1 sweeps are completed. UXO Team has not completed visual survey of the bowl; it will be completed when the snow melts. Eleven MD items located today at four locations:

Test Area 1-02 is a pile of 3each Mk 71 Rocket motors, empty, MD, at Northing-320806.92, Easting-1253620.21

Test Area 1-03 is a pile of 4each Mk 71 Rocket motors, empty, MD, at Northing-320772.89, Easting-1253604.50

Test Area 1-04 is a pile of 3each Mk 71 Rocket motors, empty, MD, at Northing-320772.74, Easting-1253619.03

Test Area 1-05 is a Mk 71 Rocket motor, empty, MD, at Northing-320770.57, Easting-1253604.75

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: Nick Carros, Navy on-site Representative	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, high of 42F, low of 29F, winds mostly NW up to 10 mph. 3-6 inches of standing snow.	IMPORTANT TELEPHONE CALLS: Pine Environmental, Jody, for Boat and associated equipment pick-up, scheduled for Friday.

TETRA TECH NUS, INC.

PERSONNEL ON SITE: 7 UXO personnel, 3 MC samplers, 1 utilities locator	
Prepared by: Scott Roberts, SUXOS	DATE: 02/03/10, Wednesday

TETRA TECH NUS, INC.

DATE	02/04/10
NO.	49
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: MC Sampling, Test Area 1, ITS removal, Area Restoration

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, 7 UXO personnel and 3 MC samplers, 1 utilities locator present. GPS units, Whites XLT and Schonstedts were tested and passed. Communications and equipment checks were good. Two to three UXOT-3's will escort the two MC sampling teams and utilities locator as necessary.

UXO Team removed the Instrument Test Strip.

UXO Team performed area restoration in Area 8 (removing stakes and flags).

UXO Team completed visual survey of the bowl in Test Area 1, no MEC/MD located. The area is now 100% complete.

Utilities locating was completed, Craig Ulrich demobilized.

No violations or discrepancies noted. All operations visually observed were IAW the Work Plan. GPS, Whites XLT and Schonstedts were tested and verified at various times throughout the day and at the end of the work day.

VISITORS ON SITE: Joe Rail, Navy RPM	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: No work on-site tomorrow, samplers demobilizing due to severe storm forecast for tomorrow. UXO personnel will receive 8 hour HAZWOPER training.
WEATHER CONDITIONS: Cloudy, high of 39F, low of 28F, winds mostly NW up to 10 mph. 3-6 inches of standing snow.	IMPORTANT TELEPHONE CALLS: Site Manager Craig Irland phoned regarding 8hr refresher training. See above.

PERSONNEL ON SITE: 7 UXO personnel, 3 MC samplers, 1 utilities locator

Prepared by: Scott Roberts, SUXOS DATE: 02/04/10, Thursday

TETRA TECH NUS, INC.

DATE	02/08/10
NO.	51
SHEET 1 OF 1	

FIELD ACTIVITY DAILY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Area Restoration, Demobilization preparations

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Safety/ops briefings, all 6 UXO personnel present.

UXO Team performed area restoration tasks at various accessible locations. Much of the site was not accessible due to deep snow from a snowstorm which started Friday morning at about 1100 and stopped Saturday evening at about 1600.

Demobilization preparation tasks were also performed, such as packing GPS units, Schonstedts, Whites XLT and other equipment in preparation for shipping back to the locations from which they came.

Yancey and Montes will remain at this job-site for MC Sampling support and will complete area restoration and shipping of equipment, all other personnel will demobilize as scheduled.

This is the Final SUXOS Field Activity Daily Log.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: Cloudy, high of 39F, low of 28F, winds mostly NW up to 10 mph. 3-6 inches of standing snow.	IMPORTANT TELEPHONE CALLS: Site Mgr. Craig Irland for instructions pertaining to shipping of equipment.

PERSONNEL ON SITE: 6 UXO personnel

Prepared by: Scott Roberts, SUXOS DATE: 02/08/10, Monday

SECTION 5

FIELD ACTIVITY WEEKLY LOGS

TETRA TECH NUS, INC.

DATE	11/20/09
NO.	1
SHEET	1 OF 1

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 11/14/09 -11/20/09

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

11/15/09: Site Manager, UXOSO/QCS and SUXOS on site for orientation and site preparation.

11/16/09: Site management performed required briefings and site orientation for four UXO Technicians, they mobilized yesterday. All traveled to job site for orientation, to receive brush cutting equipment delivery and begin field operations. Boundaries were set at the EOD School Demolition Area and the Advanced IED Area 100% coverage sections. All 14 transects were staked in the EOD School Demolition Area. All skid steer brush cutting was completed in the EOD School Demolition Area. Approximately 75% of necessary skid steer brush cutting was completed in the Advanced IED Area 100% coverage section.

11/17/09: All skid steer brush cutting completed in the Advanced IED Area 100% coverage section. The EOD School Demolition Area 100% coverage section Schonstedt sweep was completed. Transects 1-7 were brush cut and the sweep lane marked with PVC flags. Site trailer generator was delivered. One non-ferrous metal Munitions Debris item was located today, part of a nose fuze.

11/18/09: The boundary of the Torpedo Burial Site was marked. UXO Team brush cut and marked sweep lanes for transects 8-14 and transect sweeps were completed with the Schonstedt for 1-14 in the EOD School Demolition Area. The Whites XLT sweep of the EOD School Demolition Area 100% coverage area was also completed. The Whites XLT will not be used to sweep transects 1-14 due to the high number of ferrous metal items located on the surface and low number of non ferrous items in the 100% coverage area on the surface. Most non-ferrous anomalies on the surface have been aluminum soda cans. One-ferrous metal Munitions Debris item was located in the EOD School Demolition Area

100% coverage area today. It is part of a German bomb fuze assembly.

11/19/09: UXO Team completed all necessary brush cutting in the Torpedo Burial Site.

11/20/09: UXO Team completed approximately 50% of chainsaw and weedeater brush cutting in the Advanced IED Area 100% coverage section. The Air Blast Pond boundary was set and all skid steer brush cutting completed. Remaining brush cutting in the Air Blast Pond area will be accomplished with the weedeaters and chainsaw. Site Manager demobilized.

VISITORS ON SITE: 11/18/09; Joseph Rail, Susan Yates, Curtis DeTore, Richard H. Glover and Roy Karkosh.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 3 UXO Personnel 11/15, 7 UXO Personnel 11/16-11/19, 6 UXO Personnel on site 11/20, 5 Site Visitors on 11/18	
SIGNATURE: Scott Roberts, SUXOS	DATE: 11/20/09

TETRA TECH NUS, INC.

DATE	11/24/09
NO.	2
SHEET	1 OF 1

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 11/21/09 -11/24/09

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

11/21/09: Completed Schonstedt sweep of the Torpedo Burial Site, one MD item located. Cut brush at Advanced IED Area 100% coverage section, it is approximately 80% completed for brush cutting. Staked transects 1-11, North boundary in Advanced IED Area.

11/22/09: Completed brush cutting in the Advanced IED Area 100% coverage section. Completed 40% of the Torpedo Burial Site Whites XLT sweep, no MEC or MD was located.

11/23/09: Completed the Torpedo Burial Site Whites XLT sweep. Transects, 2-24 were staked on the North end in the Stump Neck Impact Area. Established 14 of 19 transects in the Advanced IED Area.

11/24/09: All 19 transects have been established and sweep lanes marked, 40% were also brush cut.

VISITORS ON SITE: 11/23/09; Nick Carros	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: Sunbelt Equipment for Skid steer and weedeater pick up.

PERSONNEL ON SITE: 4 UXO Personnel 11/21 and 11/22, 6 UXO Personnel 11/23 and 11/24. Site Visitor on 11/23

SIGNATURE: Scott Roberts, SUXOS DATE: 11/24/09

TETRA TECH NUS, INC.

DATE	12/04/09
NO.	3
SHEET	1 OF 2

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 11/30/09 -12/04/09

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

11/30/09: Brush cutting transects in the Advanced IED Area is 90% completed. Established and brush cut transects 15 and 16 in the Torpedo Casing Disposal Area. One UXOT-3 resigned over the Thanksgiving Holiday.

12/01/09: Established Geophysical Instrument Test Strip. Schonstedt sweep performed on transects 6-19 in Advanced IED Area. Whites XLT sweep performed on transects 15-19.

12/02/09: Whites XLT sweep on transects 12-14. Schonstedt and Whites XLT sweep performed on 30% of the Advanced IED Area 100% coverage section. Water was pumped out of SWMU-27 and numerous MD and potential MEC items were visually located and photographed.

12/03/09: Geophysical data collection was completed in the EOD School Demolition Area 100% coverage section. Schonstedt and Whites XLT sweep of the Advanced IED Area 100% coverage section is 50% completed.

12/04/09: Geophysical data collection was completed in the EOD School Demolition Area transects. All transects have now been swept with Schonstedts in the Advanced IED Area, and all brush cutting has been completed. The Schonstedt and Whites XLT sweeps in the 100% coverage section is 80% completed. Research is ongoing for classification of items located.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 5 UXO Personnel, 1 Site Manager, 1 Geophysicist	
SIGNATURE: Scott Roberts, SUXOS	DATE: 12/04/09

TETRA TECH NUS, INC.

DATE	12/04/09
NO.	3
SHEET	1 OF 2

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 11/30/09 -12/04/09

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

11/30/09: Brush cutting transects in the Advanced IED Area is 90% completed. Established and brush cut transects 15 and 16 in the Torpedo Casing Disposal Area. One UXOT-3 resigned over the Thanksgiving Holiday.

12/01/09: Established Geophysical Instrument Test Strip. Schonstedt sweep performed on transects 6-19 in Advanced IED Area. Whites XLT sweep performed on transects 15-19.

12/02/09: Whites XLT sweep on transects 12-14. Schonstedt and Whites XLT sweep performed on 30% of the Advanced IED Area 100% coverage section. Water was pumped out of SWMU-27 and numerous MD and potential MEC items were visually located and photographed.

12/03/09: Geophysical data collection was completed in the EOD School Demolition Area 100% coverage section. Schonstedt and Whites XLT sweep of the Advanced IED Area 100% coverage section is 50% completed.

12/04/09: Geophysical data collection was completed in the EOD School Demolition Area transects. All transects have now been swept with Schonstedts in the Advanced IED Area, and all brush cutting has been completed. The Schonstedt and Whites XLT sweeps in the 100% coverage section is 80% completed. Research is ongoing for classification of items located.

VISITORS ON SITE: None	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 5 UXO Personnel, 1 Site Manager, 1 Geophysicist	
SIGNATURE: Scott Roberts, SUXOS	DATE: 12/04/09

TETRA TECH NUS, INC.

DATE	12/09/09
NO.	4
SHEET	1 OF 2

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 12/05/09 -12/09/09

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

12/05/09: Glen Childers is on site, will replace Tom Yancey as UXOSO/QCS. Project Geophysicist Jim Coffman made preparations for geophysical data collection in the Torpedo Burial Site. Schonstedt and Whites XLT sweeps were completed in the Advanced IED Area 100% section.

12/06/09: Geophysical data collection was completed in the Torpedo Burial Site and data re-collected at EOD School demolition Area using the 858. All MEC/MD items in the Advanced IED Area 100% section have been logged and photographed. Transects 1-10 were swept with the Whites XLT.

12/07/09: Geophysical data collection was redone at the EOD School Demolition Area 100% coverage section using the EM-61. All transects in the Advanced IED Area have been swept with the Whites XLT. Brush cutting completed on accessible lengths of transects 20-22 in the Stump Neck Impact Area. Transects 12-14 were set in the Torpedo Casing Disposal Area.

12/08/09: Geophysical data collection using the EM-61 was partially completed in the Advanced IED Area 100% coverage section. Transects 16-19 were brush cut in the Stump Neck Impact Area, Dahlgren EOD performed demo ops on possible MEC items in the Advanced IED Area. UXO Team performed brush cutting operations in Area 8 in the vicinity of the Old Shot Hole.

12/09/09: Geophysical data collection using the EM-61 was completed in the Advanced IED Area. All MEC/MD items in the Advanced IED Area have been logged and photographed. Transects 7-11 were staked in the Torpedo Casing Disposal Area. Transects 12-15 were brush cut in Stump Neck Impact.

VISITORS ON SITE: Nick Carros, Navy on-site Representative. Two EOD Technicians from Dahlgren.	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: Nick Carros, MEC notifications, Craig Irland, MEC notifications
PERSONNEL ON SITE: 6 UXO Personnel, 1 Geophysicist	
SIGNATURE: Scott Roberts, SUXOS	DATE: 12/09/09 Wednesday

TETRA TECH NUS, INC.

DATE	12/19/09
NO.	5
SHEET	1 OF 2

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 12/14/09 -12/19/09

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

12/14/09: Torpedo Casing Disposal Area remaining transect stakes set, all brush cutting completed, transect sweep lanes were flagged, UXO sweep performed on 100% of the area. No MEC or MD. Stump Neck Impact Area brush cutting completed from transect 22 thru 2, transects 2-12 were swept with Schonstedts, no MEC or MD located.

12/15/09: Stump Neck Impact Area transect stakes set for 25-30, 23-30 were brush cut. Transects 31 and 1 are inaccessible by foot. Transects 13-22 swept with Schonstedt, no MEC or MD. Valley Impact Area transects 14-19 stakes were set. Transects 1-13 are in the Range 3 exclusion zone, no access at this time.

12/16/09: Stump Neck Impact Area transects 23-30 were swept with Schonstedts. No MEC or MD. Valley Impact Area transects 19-14 sweep lanes flagged, transects 19 & 18 were brush cut.

12/17/09: Valley Impact Area transects 17-15 were brush cut. The Area 8 pond was swept and anomaly coordinates logged in the GPS, 33 total.

12/18/09: Valley Impact Area transect 14 was brush cut, transects 19-14 were swept with Schonstedts. The Area 8 portion of Chicamuxen Creek was swept and anomaly coordinates logged in the GPS.

12/19/09: No Field operations performed due to blizzard conditions in the area. All personnel will demobilize tomorrow for a two week holiday break and mobilize again on 01/03/10.	
VISITORS ON SITE: Joe Rail, Navy RPM on 12/17	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: Sunbelt Rentals on 12/15 to replace a broken weedeater. Sunbelt Rentals on 12/18, spoke to Rick Coleman, all rental equipment is off-rent 12/20/09 – 01/03/10
PERSONNEL ON SITE: 6 UXO Personnel	
SIGNATURE: Scott Roberts, SUXOS	DATE: 12/19/09 Saturday

TETRA TECH NUS, INC.

DATE	01/08/10
NO.	6
SHEET	1 OF 2

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 01/04/10 -01/08/10

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

01/04/10: Mobilization yesterday. Site Manager and five UXO Techs present. Yancey is UXOSO/QCS again, Childers and Soha reassigned to other jobs, New UXOT-1 on site, A. Smith, briefed on WP and HASP. Whites XLT sweep performed on transects 14 & 15. Brush cut 10% of remaining Air Blast Pond brush. GPS training provided by John Wright for site GPS users.

01/05/10: Project Geophysicist performed data collection in Stump Neck Impact transects. UXO Team identified two possible MEC items and five MD items in transects 19 and 14 of Valley Impact Area. UXO Team marked areas encompassing 17 water shot locations in Area 8.

01/06/10: Geophysical Data collection was completed in Stump Neck Impact Area transects. UXO team marked all areas encompassing water shot locations in Area 8.

01/07/10: UXO Team cut and swept the southern swampy portions of transects 14, 15 and 16 in Valley Impact Area, transect 17 southern portion was inaccessible. An SUU-14 submunition dispenser, still containing some submunitions (possibly BLU-3, BLU-17 or BLU-24), was located on VIA T-15. UXO team marked areas encompassing Air Shot locations in Area 8. Project Geophysicist completed geophysical data collection in Torpedo Casing Disposal Area transects and Valley Impact Area transects 19, 18 and 16. UXOT-3 M. Soha returned to the site @ 1400, briefed by UXOSO, started ops. Access to transects 1-12 inside the Range 3 exclusion zone was approved for tomorrow.

01/08/10: UXO team set and marked transects 1-12 in the Valley Impact Area, transects 1-6 and 8-10 were brush cut and swept with Schonstedt. The UXO Team located 3 MD items in transect 6 and 5 MD items in transect 10. Project Geophysicist performed geophysical data collection in Valley Impact Area transects 17, 15, 14, 1, 2 and 3 excluding the portions of transects 14 and 15 that went through the Advanced IED Area.

VISITORS ON SITE: Joe Rail Navy RPM on 01/07	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: 4x4 pick up truck rental 01/07/10
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 5 UXO Personnel thru 01/06, 6 UXO Personnel 01/07 & 01/08 1 Site Manager (demobilized 01/06), 1 Project Geophysicist (mobilized 01/04)	
SIGNATURE: Scott Roberts, SUXOS	DATE: 01/08/10 Friday

TETRA TECH NUS, INC.

DATE	01/13/10
NO.	7
SHEET	1 OF 2

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 01/09/10 -01/13/10

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

01/09/10: UXO Team set and marked transect 13 in the Valley Impact Area, transects 7 and 11-13 were brush cut and swept with Schonstedt. Two MD items located on transect 7, M-100 series bomb fuzes. Project Geophysicist performed geophysical data collection in Valley Impact Area transects 4-9. Valley Impact Area operations are completed. UXO Team completed marking Area 8 Air Shot locations to be swept.

01/10/10: Project Geophysicist demobilized. UXO Team brush cut and swept 25% of Area 8 Air Shot locations.

01/11/10: UXO Team set and marked all 8 transects in the Basic IED Area. UXO Team Brush cut in Air Blast Pond. Brush cutting is 80% completed. The down-hole magnetometer was sent via Fed-Ex back to the Site Manager per request.

01/12/10: Tetra Tech Project Manager Ralph Basinski and MC sampler Terry Rojahn are on site to plan and coordinate MC sampling activities. UXOSO provided a safety briefing. I will escort them to the various sites where MC sampling is scheduled to be performed. UXO Team brush cut transects and the 100% coverage section in the Basic IED Area. Brush cutting is 50% completed.

01/13/10: UXO Team brush cut in the Air Blast Pond. Brush cutting is 100% completed in Air Blast Pond. UXO Team swept 25 % of areas encompassing water shot locations in Area 8 using Schonstedt and Whites XLT, and 10% of Air Blast Pond.

VISITORS ON SITE: Ralph Basinski, Project Mgr., Terry Rojahn, MC sampler on 01/12/10. Joe Rail Navy RPM 01/13/10	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: None
PERSONNEL ON SITE: 6 UXO Personnel, 1 Project Geophysicist (demobilized 01/10), 1 Project Manager, 1 MC sampler both on 01/12/10 and Joe Rail Navy RPM on 01/13/10	
SIGNATURE: Scott Roberts, SUXOS	DATE: 01/13/10 Wednesday

TETRA TECH NUS, INC.

DATE	01/22/10
NO.	8
SHEET	1 OF 2

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 01/18/10 -01/22/10

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

01/18/10: UXO Team swept 25 % of areas encompassing water shot locations in Area 8 using Schonstedt and Whites XLT, one MD item located. UXOT-3 M. Soha demobilized the site at 1230.

01/19/10: MC sampling. One MD item identified from Area 8, Area 8-02; it's a chemical switch/horn for a sea mine. UXO Team swept 50% of remaining Air Blast Pond area. Total of 60% completed.

01/20/10: MC sampling. UXO Team swept 30% of remaining Air Blast Pond area, 90% completed.

01/21/10: MC sampling. One MD item located near ESDA, 500lb bomb casing. UXO Team swept 10% of remaining Air Blast Pond area, 100% completed. One MD item located, it is believed to be an empty Tiny Tim rocket warhead. UXO Team swept transects 8, 7 and about half of transect 6 in Basic IED Area using Schonstedt and Whites XLT. Located 9 MD items. In Area 8 while performing QC sweeps the UXOSO/QC located Area8-03, a torpedo exploder. The Navy EOD unit from Dahlgren sent two Technicians to the site today to inspect possible MEC items. UXO Team swept in Area 8 using Schonstedts and Whites XLT, Area 8 is approximately 85% completed.

01/22/10: MC sampling. UXO Team swept in Area 8 using Schonstedts and Whites XLT, Area 8 is 95% completed.

VISITORS ON SITE: Dahlgren EOD & Joe Rail, Navy RPM on 1/21	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: Site Mgr. Craig Irland and Nick Carros, for notifications on 1/21.
PERSONNEL ON SITE: 6 UXO Personnel on 1/18, 1/21 and 1/22, 5 Personnel on 1/19 and 1/20, 2 MC samplers 1/19-1/21, 1 MC sampler on 1/22	

SIGNATURE: Scott Roberts, SUXOS	DATE: 01/22/10 Friday

TETRA TECH NUS, INC.

DATE	01/27/10
NO.	9
SHEET	1 OF 1

FIELD ACTIVITY WEEKLY LOG

PROJECT NAME: MRP-SI at Naval Support Facility Indian Head-Stump Neck Annex	PROJECT NO: 112G00810

FIELD ACTIVITY SUBJECT: Weekly summary 01/23/10 -01/27/10

DESCRIPTION OF WEEKLY ACTIVITIES AND EVENTS:

01/23/10: MC sampling. UXO Team swept in Area 8 using Schonstedts and Whites XLT, 8 MD items located today. Area 8 is 100% completed. Ferrous anomaly clusters marked in GPS data. UXO Team swept in Basic IED Area, transects 8, 7 and half of 6 using Schonstedts and Whites XLT.

01/24/10: MC sampling. UXO Team swept in Basic IED Area, transects 4, 5 and half of 6 using Schonstedts and Whites XLT. Numerous sub-surface anomalies and surface debris.

01/25/10: MC sampling. UXO Team swept in Basic IED Area transects 1-3, 9&10 using Schonstedts and Whites XLT. Numerous sub-surface anomalies and surface debris.

01/26/10: MC sampling. UXO Team swept in Basic IED Area 100% section using Schonstedts and Whites XLT. The area is approximately 70% completed. Numerous sub-surface anomalies and surface debris.

01/27/10: MC sampling. UXO Team swept in Basic IED Area 100% section using Schonstedts and Whites XLT. The area is completed, total of 0 MEC, 24 MD items located in the Basic IED Area. UXO Team relocated to Test Area 1 and cut brush.

VISITORS ON SITE: Nick Carros on 1/27/10	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS: None
WEATHER CONDITIONS: See daily reports.	IMPORTANT TELEPHONE CALLS: None

PERSONNEL ON SITE: 7 UXO Personnel on 1/23 & 1/24, 6 UXO Personnel on 1/25-1/27, 2 MC samplers

SIGNATURE: Scott Roberts, SUXOS DATE: 01/27/10 Wednesday

APPENDIX D

MEC SI SITE PHOTOS
(ON CD)

APPENDIX E

GEOPHYSICAL DATA
(ON CD)

APPENDIX E
TABLE 7-1
ADVANCED IED AREA - UXO 5
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Buried Metallic Items			
Anomaly Number	Response	Easting	Northing
1	30.06	1245167.84	321317.08
2	25.26	1245168.38	321319.78
3	23.52	1245123.62	321321.40
4	17.35	1245099.89	321323.55
5	22.51	1245109.59	321323.82
6	17.11	1245123.89	321324.09
7	17.29	1245130.63	321325.44
8	5.82	1245169.73	321325.71
9	7.80	1245096.92	321325.98
10	8.97	1245111.21	321330.57
11	22.97	1245166.49	321331.10
12	25.96	1245178.89	321331.37
13	7.36	1245127.93	321331.64
14	19.95	1245170.54	321331.64
15	7.43	1245098.81	321331.91
16	18.80	1245169.19	321331.91
17	13.18	1245103.12	321332.72
18	24.94	1245181.59	321332.72
19	16.27	1245131.17	321332.99
20	20.84	1245173.77	321332.99
21	20.29	1245173.23	321334.61
22	27.36	1245181.86	321334.88
23	27.71	1245118.22	321335.42
24	9.33	1245160.02	321335.69
25	41.56	1245102.85	321335.96
26	6.45	1245140.60	321335.96
27	39.35	1245168.11	321336.50
28	10.38	1245138.45	321338.65
29	48.85	1245172.69	321338.65
30	15.18	1245160.56	321340.00
31	14.50	1245161.91	321341.08
32	16.79	1245179.97	321341.35
33	18.78	1245174.04	321342.16
34	18.44	1245109.32	321342.70
35	35.79	1245127.39	321342.97
36	5.83	1245141.68	321342.97
37	6.39	1245100.43	321344.32
38	15.23	1245180.78	321344.59
39	47.86	1245122.81	321344.86

40	7.14	1245105.01	321345.67
41	10.51	1245141.14	321345.67
42	11.77	1245139.80	321345.94
43	10.89	1245099.08	321347.28
44	11.29	1245127.39	321347.28
45	18.17	1245172.42	321347.28
46	6.95	1245105.82	321347.82
47	14.83	1245158.67	321347.82
48	6.50	1245106.09	321348.36
49	14.11	1245171.61	321348.63
50	312.58	1245241.45	321349.44
51	8.08	1245181.32	321349.98
52	13.31	1245134.13	321350.52
53	184.29	1245174.04	321350.79
54	12.08	1245184.83	321350.79
55	10.04	1245105.28	321351.06
56	35.31	1245155.97	321351.06
57	9.26	1245106.36	321352.68
58	8.24	1245179.97	321353.22
59	356.85	1245242.26	321353.76
60	101.59	1245168.92	321354.29
61	11.75	1245144.92	321356.72
62	411.57	1245185.64	321357.26
63	418.20	1245187.52	321357.26
64	370.44	1245197.50	321357.80
65	7.76	1245181.05	321358.34
66	487.40	1245188.87	321358.88
67	12.05	1245140.33	321359.15
68	7.06	1245155.97	321359.96
69	14.05	1245230.67	321359.96
70	11.13	1245141.41	321360.50
71	13.37	1245138.99	321360.77
72	5.06	1245149.77	321360.77
73	35.03	1245118.49	321361.57
74	13.01	1245144.11	321361.57
75	214.95	1245132.51	321362.38
76	5.67	1245175.93	321362.65
77	19.23	1245181.32	321362.65
78	44.25	1245120.65	321362.92
79	6.70	1245155.17	321363.46
80	37.22	1245229.86	321364.00
81	68.10	1245117.14	321364.54
82	204.39	1245129.28	321364.54
83	5.25	1245176.20	321364.81
84	22.06	1245181.59	321364.81
85	23.99	1245197.50	321365.08
86	20.37	1245219.88	321365.08

87	63.77	1245120.65	321365.35
88	15.62	1245142.76	321365.35
89	34.86	1245157.59	321365.35
90	36.88	1245250.08	321365.62
91	9.96	1245184.83	321366.16
92	25.75	1245200.47	321366.70
93	23.02	1245232.29	321366.70
94	9.49	1245176.20	321367.24
95	12.86	1245133.86	321367.51
96	41.03	1245145.46	321367.51
97	83.23	1245114.18	321368.32
98	8.33	1245185.64	321368.32
99	125.36	1245127.39	321368.59
100	72.73	1245121.19	321369.39
101	19.58	1245223.66	321369.39
102	9.09	1245179.16	321370.20
103	35.09	1245103.39	321370.74
104	110.12	1245127.93	321370.74
105	35.47	1245105.01	321371.01
106	6.94	1245182.67	321371.01
107	65.01	1245112.02	321371.82
108	109.76	1245123.08	321371.82
109	7.53	1245143.84	321371.82
110	6.27	1245145.46	321372.09
111	12.10	1245138.99	321372.63
112	6.02	1245194.80	321372.90
113	43.98	1245202.35	321372.90
114	25.11	1245102.04	321373.44
115	23.85	1245167.30	321373.44
116	13.38	1245100.16	321373.71
117	8.20	1245139.26	321373.71
118	45.79	1245105.01	321374.25
119	42.73	1245177.55	321374.52
120	10.68	1245142.22	321375.06
121	21.54	1245184.02	321375.06
122	8.45	1245191.03	321375.33
123	40.71	1245103.93	321375.60
124	113.25	1245111.75	321375.60
125	56.75	1245177.01	321376.68
126	17.17	1245131.17	321377.21
127	19.17	1245114.72	321378.29
128	10.07	1245105.28	321378.56
129	11.86	1245188.06	321378.83
130	11.70	1245169.73	321379.10
131	10.77	1245189.68	321379.37
132	114.15	1245111.21	321379.64
133	18.00	1245155.17	321379.64

134	5.78	1245152.47	321380.18
135	36.79	1245108.79	321380.45
136	6.43	1245127.66	321380.72
137	20.54	1245237.68	321380.72
138	6.52	1245203.97	321380.99
139	7.11	1245121.46	321381.26
140	5.09	1245206.94	321381.80
141	23.72	1245212.87	321381.80
142	7.99	1245181.59	321382.07
143	21.46	1245210.98	321382.07
144	54.35	1245110.94	321382.34
145	10.56	1245157.05	321382.61
146	7.71	1245204.24	321382.61
147	56.88	1245112.29	321383.42
148	8.32	1245195.88	321383.42
149	6.41	1245116.61	321383.96
150	9.62	1245124.16	321384.50
151	71.90	1245112.83	321384.76
152	26.72	1245186.44	321385.03
153	196.95	1245246.31	321385.03
154	22.08	1245111.75	321385.84
155	16.77	1245104.20	321386.38
156	11.18	1245106.36	321386.38
157	5.35	1245180.24	321386.38
158	26.92	1245187.52	321386.38
159	8.69	1245215.84	321386.38
160	11.14	1245139.80	321386.92
161	7.19	1245144.38	321388.00
162	9.41	1245169.46	321388.00
163	46.75	1245149.50	321388.54
164	11.10	1245167.30	321388.81
165	6.72	1245131.17	321389.35
166	5.63	1245212.87	321390.70
167	6.40	1245210.98	321391.24
168	15.60	1245169.19	321391.78
169	7.32	1245175.93	321391.78
170	5.85	1245197.23	321391.78
171	59.33	1245100.70	321392.32
172	20.74	1245128.74	321392.58
173	20.04	1245186.44	321392.85
174	12.27	1245218.53	321392.85
175	19.82	1245131.17	321393.12
176	21.73	1245184.02	321393.39
177	11.51	1245208.56	321394.74
178	6.20	1245212.33	321394.74
179	12.15	1245213.95	321394.74
180	29.47	1245185.37	321396.36

181	5.62	1245195.07	321400.13
182	22.80	1245129.55	321400.40
183	19.56	1245134.40	321400.40
184	16.39	1245162.45	321400.94
185	6.43	1245200.47	321401.48
186	16.17	1245133.32	321402.02
187	6.72	1245159.48	321402.02
188	7.43	1245195.07	321402.02
189	427.66	1245219.07	321402.02
190	33.14	1245130.09	321402.29
191	9.88	1245128.47	321402.83
192	13.47	1245183.21	321403.10
193	6.71	1245188.33	321404.18
194	13.00	1245134.67	321404.45
195	13.48	1245186.44	321406.07
196	24.45	1245195.61	321406.88
197	47.59	1245199.66	321407.42
198	41.99	1245203.16	321408.76
199	67.37	1245130.09	321409.30
200	7.20	1245182.13	321409.57
201	20.19	1245189.68	321409.57
202	6.45	1245134.94	321409.84
203	23.03	1245131.98	321410.11
204	17.60	1245102.58	321410.65
205	27.52	1245198.85	321410.65
206	12.43	1245140.06	321410.92
207	29.03	1245202.89	321411.46
208	6.47	1245118.76	321411.73
209	33.54	1245132.51	321411.73
210	27.56	1245199.66	321412.27
211	8.17	1245108.79	321413.35
212	40.15	1245201.81	321413.35
213	5.49	1245173.50	321413.62
214	5.73	1245132.78	321414.16
215	32.72	1245197.77	321414.16
216	5.10	1245215.30	321414.43
217	10.27	1245103.39	321414.97
218	5.57	1245119.57	321415.24
219	24.43	1245113.64	321415.77
220	8.38	1245165.41	321415.77
221	7.39	1245172.96	321415.77
222	18.67	1245195.34	321415.77
223	8.92	1245210.17	321415.77
224	7.23	1245130.63	321416.04
225	10.16	1245104.20	321416.58
226	5.09	1245133.86	321416.58
227	18.88	1245188.06	321416.58

228	6.09	1245212.60	321417.39
229	6.03	1245129.55	321418.20
230	11.73	1245174.04	321418.20
231	41.48	1245177.01	321418.74
232	5.82	1245135.21	321419.01
233	9.96	1245189.14	321419.82
234	10.19	1245195.07	321420.09
235	40.29	1245133.86	321421.17
236	39.20	1245133.86	321422.52
237	7.26	1245205.86	321422.52
238	9.09	1245189.41	321423.06
239	24.66	1245150.04	321423.59
240	20.65	1245125.50	321424.67
241	6.85	1245127.66	321424.67
242	31.54	1245150.31	321424.67
243	17.90	1245172.69	321425.48
244	5.03	1245184.83	321425.48
245	7.14	1245186.44	321425.48
246	5.06	1245201.55	321425.75
247	5.85	1245201.55	321427.37
248	11.07	1245159.75	321430.07
249	11.05	1245128.20	321430.88
250	10.46	1245198.31	321430.88
251	20.25	1245166.76	321431.14
252	21.18	1245142.22	321431.68
253	7.81	1245165.14	321431.68
254	8.21	1245137.37	321433.57
255	7.09	1245176.20	321434.92
256	7.74	1245216.92	321435.19
257	13.09	1245141.68	321436.27
258	6.65	1245206.13	321437.35
259	13.31	1245129.55	321438.69
260	13.27	1245174.04	321441.39
261	10.75	1245121.73	321443.01
262	6.32	1245198.85	321444.90
263	6.25	1245171.07	321446.78
264	3685.96	1245179.16	321449.75
265	16.21	1245172.69	321450.02
266	8.01	1245200.20	321450.02
267	666.06	1245177.01	321450.83
268	20.30	1245187.52	321451.91
269	54.73	1245137.37	321453.80
270	12.23	1245190.22	321454.60
271	8.76	1245196.96	321454.60
272	8.64	1245191.84	321456.22
273	19.35	1245195.34	321458.65
274	757.81	1245127.66	321459.46

275	635.18	1245127.39	321460.81
276	9.47	1245226.08	321461.35
277	40.40	1245144.11	321461.88
278	26.85	1245205.59	321462.42
279	35.43	1245193.19	321462.96
280	11.42	1245225.00	321464.31
281	17.26	1245196.69	321465.66
282	7.57	1245203.70	321467.01
283	9.44	1245206.94	321467.28
284	18.25	1245180.78	321468.63
285	19.98	1245155.70	321471.59
286	8.92	1245183.21	321471.86
287	7.53	1245209.63	321471.86
288	7.72	1245209.10	321475.10
289	5.57	1245218.26	321476.18
290	7.86	1245222.85	321479.68
291	8.93	1245223.39	321481.57
292	9.00	1245221.23	321482.65
293	8.61	1245219.88	321483.73
294	6.36	1245224.20	321484.81
295	59.38	1245155.43	321486.96
296	5.38	1245186.71	321489.93
297	8.85	1245187.52	321491.28
298	6.33	1245177.55	321492.62
299	12.39	1245158.94	321495.32
300	26.34	1245219.61	321495.32
301	24.88	1245218.53	321496.13
302	27.79	1245221.23	321496.13
303	5.33	1245183.75	321496.67
304	6.34	1245202.89	321497.21
305	9.22	1245194.80	321497.48
306	15.53	1245198.04	321497.48
307	11.73	1245189.41	321497.75
308	41.09	1245164.06	321498.02
309	10.26	1245192.11	321498.29
310	236.21	1245166.76	321500.44
311	30.62	1245210.98	321500.44
312	124.66	1245171.88	321501.52
313	8.40	1245192.11	321502.60

Note: Coordinates stated in NAD 83 Maryland State Plane in US Survey Feet.
Response stated in millivolts from EM61.

APPENDIX E
TABLE 7-1
ADVANCED IED AREA - UXO 5
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Buried Metallic Items			
Anomaly Number	Response	Easting	Northing
1	30.06	1245167.84	321317.08
2	25.26	1245168.38	321319.78
3	23.52	1245123.62	321321.40
4	17.35	1245099.89	321323.55
5	22.51	1245109.59	321323.82
6	17.11	1245123.89	321324.09
7	17.29	1245130.63	321325.44
8	5.82	1245169.73	321325.71
9	7.80	1245096.92	321325.98
10	8.97	1245111.21	321330.57
11	22.97	1245166.49	321331.10
12	25.96	1245178.89	321331.37
13	7.36	1245127.93	321331.64
14	19.95	1245170.54	321331.64
15	7.43	1245098.81	321331.91
16	18.80	1245169.19	321331.91
17	13.18	1245103.12	321332.72
18	24.94	1245181.59	321332.72
19	16.27	1245131.17	321332.99
20	20.84	1245173.77	321332.99
21	20.29	1245173.23	321334.61
22	27.36	1245181.86	321334.88
23	27.71	1245118.22	321335.42
24	9.33	1245160.02	321335.69
25	41.56	1245102.85	321335.96
26	6.45	1245140.60	321335.96
27	39.35	1245168.11	321336.50
28	10.38	1245138.45	321338.65
29	48.85	1245172.69	321338.65
30	15.18	1245160.56	321340.00
31	14.50	1245161.91	321341.08
32	16.79	1245179.97	321341.35
33	18.78	1245174.04	321342.16
34	18.44	1245109.32	321342.70
35	35.79	1245127.39	321342.97
36	5.83	1245141.68	321342.97
37	6.39	1245100.43	321344.32
38	15.23	1245180.78	321344.59
39	47.86	1245122.81	321344.86

40	7.14	1245105.01	321345.67
41	10.51	1245141.14	321345.67
42	11.77	1245139.80	321345.94
43	10.89	1245099.08	321347.28
44	11.29	1245127.39	321347.28
45	18.17	1245172.42	321347.28
46	6.95	1245105.82	321347.82
47	14.83	1245158.67	321347.82
48	6.50	1245106.09	321348.36
49	14.11	1245171.61	321348.63
50	312.58	1245241.45	321349.44
51	8.08	1245181.32	321349.98
52	13.31	1245134.13	321350.52
53	184.29	1245174.04	321350.79
54	12.08	1245184.83	321350.79
55	10.04	1245105.28	321351.06
56	35.31	1245155.97	321351.06
57	9.26	1245106.36	321352.68
58	8.24	1245179.97	321353.22
59	356.85	1245242.26	321353.76
60	101.59	1245168.92	321354.29
61	11.75	1245144.92	321356.72
62	411.57	1245185.64	321357.26
63	418.20	1245187.52	321357.26
64	370.44	1245197.50	321357.80
65	7.76	1245181.05	321358.34
66	487.40	1245188.87	321358.88
67	12.05	1245140.33	321359.15
68	7.06	1245155.97	321359.96
69	14.05	1245230.67	321359.96
70	11.13	1245141.41	321360.50
71	13.37	1245138.99	321360.77
72	5.06	1245149.77	321360.77
73	35.03	1245118.49	321361.57
74	13.01	1245144.11	321361.57
75	214.95	1245132.51	321362.38
76	5.67	1245175.93	321362.65
77	19.23	1245181.32	321362.65
78	44.25	1245120.65	321362.92
79	6.70	1245155.17	321363.46
80	37.22	1245229.86	321364.00
81	68.10	1245117.14	321364.54
82	204.39	1245129.28	321364.54
83	5.25	1245176.20	321364.81
84	22.06	1245181.59	321364.81
85	23.99	1245197.50	321365.08
86	20.37	1245219.88	321365.08

87	63.77	1245120.65	321365.35
88	15.62	1245142.76	321365.35
89	34.86	1245157.59	321365.35
90	36.88	1245250.08	321365.62
91	9.96	1245184.83	321366.16
92	25.75	1245200.47	321366.70
93	23.02	1245232.29	321366.70
94	9.49	1245176.20	321367.24
95	12.86	1245133.86	321367.51
96	41.03	1245145.46	321367.51
97	83.23	1245114.18	321368.32
98	8.33	1245185.64	321368.32
99	125.36	1245127.39	321368.59
100	72.73	1245121.19	321369.39
101	19.58	1245223.66	321369.39
102	9.09	1245179.16	321370.20
103	35.09	1245103.39	321370.74
104	110.12	1245127.93	321370.74
105	35.47	1245105.01	321371.01
106	6.94	1245182.67	321371.01
107	65.01	1245112.02	321371.82
108	109.76	1245123.08	321371.82
109	7.53	1245143.84	321371.82
110	6.27	1245145.46	321372.09
111	12.10	1245138.99	321372.63
112	6.02	1245194.80	321372.90
113	43.98	1245202.35	321372.90
114	25.11	1245102.04	321373.44
115	23.85	1245167.30	321373.44
116	13.38	1245100.16	321373.71
117	8.20	1245139.26	321373.71
118	45.79	1245105.01	321374.25
119	42.73	1245177.55	321374.52
120	10.68	1245142.22	321375.06
121	21.54	1245184.02	321375.06
122	8.45	1245191.03	321375.33
123	40.71	1245103.93	321375.60
124	113.25	1245111.75	321375.60
125	56.75	1245177.01	321376.68
126	17.17	1245131.17	321377.21
127	19.17	1245114.72	321378.29
128	10.07	1245105.28	321378.56
129	11.86	1245188.06	321378.83
130	11.70	1245169.73	321379.10
131	10.77	1245189.68	321379.37
132	114.15	1245111.21	321379.64
133	18.00	1245155.17	321379.64

134	5.78	1245152.47	321380.18
135	36.79	1245108.79	321380.45
136	6.43	1245127.66	321380.72
137	20.54	1245237.68	321380.72
138	6.52	1245203.97	321380.99
139	7.11	1245121.46	321381.26
140	5.09	1245206.94	321381.80
141	23.72	1245212.87	321381.80
142	7.99	1245181.59	321382.07
143	21.46	1245210.98	321382.07
144	54.35	1245110.94	321382.34
145	10.56	1245157.05	321382.61
146	7.71	1245204.24	321382.61
147	56.88	1245112.29	321383.42
148	8.32	1245195.88	321383.42
149	6.41	1245116.61	321383.96
150	9.62	1245124.16	321384.50
151	71.90	1245112.83	321384.76
152	26.72	1245186.44	321385.03
153	196.95	1245246.31	321385.03
154	22.08	1245111.75	321385.84
155	16.77	1245104.20	321386.38
156	11.18	1245106.36	321386.38
157	5.35	1245180.24	321386.38
158	26.92	1245187.52	321386.38
159	8.69	1245215.84	321386.38
160	11.14	1245139.80	321386.92
161	7.19	1245144.38	321388.00
162	9.41	1245169.46	321388.00
163	46.75	1245149.50	321388.54
164	11.10	1245167.30	321388.81
165	6.72	1245131.17	321389.35
166	5.63	1245212.87	321390.70
167	6.40	1245210.98	321391.24
168	15.60	1245169.19	321391.78
169	7.32	1245175.93	321391.78
170	5.85	1245197.23	321391.78
171	59.33	1245100.70	321392.32
172	20.74	1245128.74	321392.58
173	20.04	1245186.44	321392.85
174	12.27	1245218.53	321392.85
175	19.82	1245131.17	321393.12
176	21.73	1245184.02	321393.39
177	11.51	1245208.56	321394.74
178	6.20	1245212.33	321394.74
179	12.15	1245213.95	321394.74
180	29.47	1245185.37	321396.36

181	5.62	1245195.07	321400.13
182	22.80	1245129.55	321400.40
183	19.56	1245134.40	321400.40
184	16.39	1245162.45	321400.94
185	6.43	1245200.47	321401.48
186	16.17	1245133.32	321402.02
187	6.72	1245159.48	321402.02
188	7.43	1245195.07	321402.02
189	427.66	1245219.07	321402.02
190	33.14	1245130.09	321402.29
191	9.88	1245128.47	321402.83
192	13.47	1245183.21	321403.10
193	6.71	1245188.33	321404.18
194	13.00	1245134.67	321404.45
195	13.48	1245186.44	321406.07
196	24.45	1245195.61	321406.88
197	47.59	1245199.66	321407.42
198	41.99	1245203.16	321408.76
199	67.37	1245130.09	321409.30
200	7.20	1245182.13	321409.57
201	20.19	1245189.68	321409.57
202	6.45	1245134.94	321409.84
203	23.03	1245131.98	321410.11
204	17.60	1245102.58	321410.65
205	27.52	1245198.85	321410.65
206	12.43	1245140.06	321410.92
207	29.03	1245202.89	321411.46
208	6.47	1245118.76	321411.73
209	33.54	1245132.51	321411.73
210	27.56	1245199.66	321412.27
211	8.17	1245108.79	321413.35
212	40.15	1245201.81	321413.35
213	5.49	1245173.50	321413.62
214	5.73	1245132.78	321414.16
215	32.72	1245197.77	321414.16
216	5.10	1245215.30	321414.43
217	10.27	1245103.39	321414.97
218	5.57	1245119.57	321415.24
219	24.43	1245113.64	321415.77
220	8.38	1245165.41	321415.77
221	7.39	1245172.96	321415.77
222	18.67	1245195.34	321415.77
223	8.92	1245210.17	321415.77
224	7.23	1245130.63	321416.04
225	10.16	1245104.20	321416.58
226	5.09	1245133.86	321416.58
227	18.88	1245188.06	321416.58

228	6.09	1245212.60	321417.39
229	6.03	1245129.55	321418.20
230	11.73	1245174.04	321418.20
231	41.48	1245177.01	321418.74
232	5.82	1245135.21	321419.01
233	9.96	1245189.14	321419.82
234	10.19	1245195.07	321420.09
235	40.29	1245133.86	321421.17
236	39.20	1245133.86	321422.52
237	7.26	1245205.86	321422.52
238	9.09	1245189.41	321423.06
239	24.66	1245150.04	321423.59
240	20.65	1245125.50	321424.67
241	6.85	1245127.66	321424.67
242	31.54	1245150.31	321424.67
243	17.90	1245172.69	321425.48
244	5.03	1245184.83	321425.48
245	7.14	1245186.44	321425.48
246	5.06	1245201.55	321425.75
247	5.85	1245201.55	321427.37
248	11.07	1245159.75	321430.07
249	11.05	1245128.20	321430.88
250	10.46	1245198.31	321430.88
251	20.25	1245166.76	321431.14
252	21.18	1245142.22	321431.68
253	7.81	1245165.14	321431.68
254	8.21	1245137.37	321433.57
255	7.09	1245176.20	321434.92
256	7.74	1245216.92	321435.19
257	13.09	1245141.68	321436.27
258	6.65	1245206.13	321437.35
259	13.31	1245129.55	321438.69
260	13.27	1245174.04	321441.39
261	10.75	1245121.73	321443.01
262	6.32	1245198.85	321444.90
263	6.25	1245171.07	321446.78
264	3685.96	1245179.16	321449.75
265	16.21	1245172.69	321450.02
266	8.01	1245200.20	321450.02
267	666.06	1245177.01	321450.83
268	20.30	1245187.52	321451.91
269	54.73	1245137.37	321453.80
270	12.23	1245190.22	321454.60
271	8.76	1245196.96	321454.60
272	8.64	1245191.84	321456.22
273	19.35	1245195.34	321458.65
274	757.81	1245127.66	321459.46

275	635.18	1245127.39	321460.81
276	9.47	1245226.08	321461.35
277	40.40	1245144.11	321461.88
278	26.85	1245205.59	321462.42
279	35.43	1245193.19	321462.96
280	11.42	1245225.00	321464.31
281	17.26	1245196.69	321465.66
282	7.57	1245203.70	321467.01
283	9.44	1245206.94	321467.28
284	18.25	1245180.78	321468.63
285	19.98	1245155.70	321471.59
286	8.92	1245183.21	321471.86
287	7.53	1245209.63	321471.86
288	7.72	1245209.10	321475.10
289	5.57	1245218.26	321476.18
290	7.86	1245222.85	321479.68
291	8.93	1245223.39	321481.57
292	9.00	1245221.23	321482.65
293	8.61	1245219.88	321483.73
294	6.36	1245224.20	321484.81
295	59.38	1245155.43	321486.96
296	5.38	1245186.71	321489.93
297	8.85	1245187.52	321491.28
298	6.33	1245177.55	321492.62
299	12.39	1245158.94	321495.32
300	26.34	1245219.61	321495.32
301	24.88	1245218.53	321496.13
302	27.79	1245221.23	321496.13
303	5.33	1245183.75	321496.67
304	6.34	1245202.89	321497.21
305	9.22	1245194.80	321497.48
306	15.53	1245198.04	321497.48
307	11.73	1245189.41	321497.75
308	41.09	1245164.06	321498.02
309	10.26	1245192.11	321498.29
310	236.21	1245166.76	321500.44
311	30.62	1245210.98	321500.44
312	124.66	1245171.88	321501.52
313	8.40	1245192.11	321502.60

Note: Coordinates stated in NAD 83 Maryland State Plane in US Survey Feet.
Response stated in millivolts from EM61.

APPENDIX E
TABLE 8-1
STUMP NECK IMPACT AREA - UXO 10
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Buried Ferrous Metallic Items			
Anomaly Number	Response	Easting	Northing
1	5.29	1249953.43	321986.09
2	5.01	1250006.21	322010.36
3	5.25	1249967.16	322026.20
4	5.44	1249939.71	322027.25
5	12.40	1249997.76	322044.14
6	5.08	1249246.28	322077.91
7	5.60	1249974.54	322099.02
8	5.52	1249905.94	322102.19
9	6.00	1249265.28	322108.52
10	9.37	1249901.72	322113.80
11	6.53	1249896.44	322126.46
12	5.06	1249262.11	322141.24
13	7.56	1249996.71	322146.52
14	5.13	1249289.56	322147.57
15	6.87	1249885.89	322154.96
16	6.81	1249990.38	322164.46
17	8.88	1249298.00	322165.51
18	6.09	1249295.89	322185.57
19	6.09	1250046.31	322188.73
20	11.55	1249294.83	322191.90
21	5.99	1249866.89	322192.96
22	5.16	1250047.37	322199.29
23	5.19	1249972.43	322203.51
24	6.02	1249973.49	322208.79
25	6.68	1249968.21	322215.12
26	5.42	1248931.76	322220.40
27	7.93	1249969.27	322221.45
28	5.54	1249966.10	322224.62
29	5.65	1249293.78	322229.90
30	5.63	1249410.93	322229.90
31	5.33	1249921.77	322230.95
32	8.07	1249533.37	322241.51
33	6.42	1248968.70	322242.56
34	7.13	1250020.98	322242.56
35	5.36	1249096.41	322244.67
36	15.38	1250022.04	322248.89
37	5.78	1250057.92	322251.01
38	5.16	1249401.43	322253.12
39	5.88	1249098.52	322255.23

40	9.27	1249748.68	322256.28
41	9.59	1249935.49	322256.28
42	9.64	1249291.67	322263.67
43	11.32	1249406.71	322271.06
44	6.08	1249011.97	322275.28
45	5.35	1249679.02	322285.84
46	7.66	1249680.07	322290.06
47	5.81	1249901.72	322293.22
48	6.05	1249898.55	322301.67
49	6.25	1249679.02	322303.78
50	5.44	1249193.51	322306.94
51	5.44	1249410.93	322313.28
52	5.41	1249382.44	322321.72
53	5.32	1249932.33	322324.89
54	6.27	1249827.84	322327.00
55	6.03	1250007.26	322328.05
56	5.53	1249725.46	322332.28
57	5.01	1249675.85	322335.44
58	122.33	1248954.98	322340.72
59	5.28	1250011.48	322340.72
60	5.40	1249378.21	322342.83
61	5.30	1249231.51	322347.05
62	5.51	1249820.45	322354.44
63	7.58	1249400.38	322355.50
64	121.31	1249573.47	322356.55
65	5.08	1249196.68	322363.94
66	24.98	1249451.04	322364.99
67	5.20	1249198.79	322380.83
68	6.93	1249199.84	322386.10
69	5.87	1249394.05	322387.16
70	8.71	1249813.06	322389.27
71	5.36	1249392.99	322392.44
72	5.26	1249229.40	322405.10
73	5.78	1249390.88	322405.10
74	5.36	1249387.71	322419.88
75	5.20	1249288.50	322421.99
76	5.13	1249198.79	322423.04
77	5.40	1249229.40	322423.04
78	5.71	1249199.84	322429.38
79	5.40	1249288.50	322433.60
80	8.61	1249382.44	322439.93
81	5.33	1249200.90	322447.32
82	5.14	1249350.77	322459.98
83	5.65	1249380.32	322466.32
84	7.33	1249287.45	322473.71
85	5.41	1249342.33	322478.98
86	5.08	1249788.78	322488.48

87	5.57	1249341.27	322491.65
88	6.59	1249375.05	322495.87
89	9.85	1249460.54	322503.26
90	8.96	1249219.90	322506.42
91	7.26	1249848.94	322507.48
92	10.48	1249222.01	322511.70
93	7.93	1249639.97	322513.81
94	5.50	1249330.72	322519.09
95	5.98	1249847.89	322520.15
96	5.50	1249328.61	322523.31
97	5.25	1249161.85	322525.42
98	5.34	1249373.99	322526.48
99	7.31	1249491.15	322530.70
100	8.91	1249372.94	322531.76
101	11.67	1249842.61	322539.14
102	8.63	1249458.43	322540.20
103	11.23	1249836.28	322542.31
104	6.33	1249289.56	322543.37
105	32.11	1249200.90	322554.98
106	19.11	1249204.06	322558.14
107	9.70	1249323.33	322564.47
108	5.33	1249833.11	322564.47
109	5.11	1249834.17	322568.70
110	7.11	1249424.65	322570.81
111	5.20	1249629.41	322570.81
112	5.52	1249283.22	322571.86
113	17.73	1249427.82	322572.92
114	6.21	1249625.19	322573.97
115	6.70	1249632.58	322573.97
116	6.09	1249283.22	322588.75
117	14.59	1249158.68	322590.86
118	30.71	1249524.92	322599.30
119	5.53	1249460.54	322601.42

Note: Coordinates stated in NAD 83 Maryland State Plane in US Survey Feet.
Response stated in nanoteslas per two feet from Vertical Magnetic Gradient.

APPENDIX E
TABLE 9-1
TORPEDO BURIAL AREA - UXO 12
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Buried Ferrous Metallic Items			
Anomaly Number	Response	Easting	Northing
1	200.80	1249537.09	322634.35
2	1977.80	1249549.07	322641.69
3	336.84	1249561.05	322643.24
4	396.67	1249555.25	322644.01
5	840.73	1249542.50	322646.33
6	651.23	1249573.03	322650.58
7	630.14	1249542.11	322650.97
8	128.81	1249562.60	322652.90
9	65.03	1249547.13	322654.45
10	1331.03	1249527.42	322663.72
11	1144.48	1249531.67	322664.88
12	349.83	1249536.31	322665.27
13	2344.46	1249527.42	322666.04
14	2719.03	1249544.82	322672.23
15	2321.97	1249549.45	322673.39
16	629.89	1249553.32	322673.39
17	310.63	1249557.96	322673.39
18	248.67	1249566.85	322673.39
19	130.89	1249562.21	322675.32
20	1937.61	1249518.92	322676.48
21	506.61	1249524.72	322676.48
22	1495.46	1249530.51	322676.48
23	157.58	1249539.02	322677.25
24	367.86	1249542.88	322677.25
25	1446.62	1249555.25	322677.25
26	60.59	1249697.49	322684.98
27	304.83	1249537.09	322686.53
28	5217.19	1249545.98	322689.62
29	149.30	1249563.37	322694.26
30	151.16	1249515.83	322694.64
31	846.10	1249549.07	322697.74
32	1583.87	1249553.71	322699.67
33	319.47	1249498.43	322701.60
34	1170.28	1249537.09	322701.60
35	1199.26	1249538.63	322701.60
36	1224.78	1249540.56	322701.60
37	142.60	1249511.57	322701.99
38	270.94	1249533.99	322703.53
39	585.40	1249758.95	322705.08

40	224.26	1249597.77	322706.24
41	108.44	1249551.77	322707.01
42	128.68	1249552.55	322711.65
43	64.48	1249578.44	322713.97
44	185.72	1249610.91	322723.25
45	61.75	1249621.35	322724.79
46	69.12	1249516.99	322727.11
47	116.84	1249515.83	322734.07
48	116.92	1249515.83	322737.16
49	135.43	1249527.04	322739.48
50	108.46	1249516.99	322741.03
51	141.01	1249522.78	322741.03
52	2294.80	1249480.65	322742.19
53	282.28	1249651.50	322758.03
54	84.24	1249655.36	322761.90
55	127.06	1249702.13	322761.90
56	341.21	1249516.60	322762.67
57	2022.23	1249561.05	322762.67
58	4098.60	1249528.58	322763.45
59	22010.04	1249525.88	322764.22
60	81.56	1249664.64	322766.54
61	1351.56	1249553.71	322768.47
62	607.94	1249517.37	322771.18
63	1397.99	1249559.50	322774.27
64	250.12	1249664.64	322774.27
65	595.95	1249517.76	322776.20
66	250.63	1249665.03	322777.75
67	811.29	1249671.60	322782.00
68	52.37	1249658.84	322794.75

Note: Coordinates stated in NAD 83 Maryland State Plane in US Survey Feet.
Response stated in Analytic Signal from Vertical Magnetic Gradient.

APPENDIX E
TABLE 12-1
VALLEY IMPACT AREA - UXO 26
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Buried Ferrous Metallic Items			
Anomaly Number	Response	Easting	Northing
1	111.73	1242062.48	316949.54
2	18.54	1242021.97	316974.86
3	180.14	1242300.45	317248.27
4	19.40	1242290.32	317268.52
5	33.90	1242254.88	317278.64
6	77.76	1242214.37	317309.02
7	67.97	1242194.12	317324.21
8	54.11	1242183.99	317344.46
9	6.32	1242148.55	317369.78
10	59.25	1242047.29	317420.41
11	17.42	1242042.23	317455.85
12	326.59	1241986.53	317476.11
13	148.37	1241946.03	317496.36
14	284.07	1241920.71	317506.48
15	415.73	1242548.54	317587.49
16	35.37	1242411.83	317602.68
17	94.74	1242477.65	317612.81
18	16.41	1242391.58	317617.87
19	12.87	1242340.95	317714.07
20	14.19	1242325.76	317729.26
21	8.07	1242310.57	317739.39
22	42.58	1242275.13	317764.70
23	45.81	1242234.62	317810.27
24	238.77	1242199.18	317820.40
25	14.33	1242138.43	317855.84
26	22.38	1242118.17	317881.15
27	16.82	1242746.00	317911.53
28	24.32	1242032.10	317921.66
29	24.47	1242771.31	317936.85
30	95.23	1242528.28	318083.68
31	99.51	1242437.15	318124.18
32	8.08	1242386.52	318164.69
33	19.25	1242183.99	318296.33
34	234.30	1242862.45	318331.77
35	27.60	1242806.75	318362.15
36	15.78	1242852.32	318372.27
37	457.40	1242821.94	318377.34
38	142.76	1242811.82	318392.52
39	124.44	1242756.12	318402.65

40	75.54	1242746.00	318443.16
41	73.61	1242619.42	318478.60
42	34.09	1242659.92	318478.60
43	117.67	1242710.56	318488.72
44	67.26	1242614.36	318498.85
45	57.47	1242664.99	318498.85
46	9.91	1242573.85	318508.98
47	10.04	1242447.27	318584.92
48	9.02	1242427.02	318605.17
49	18.48	1242406.77	318630.49
50	7.46	1242427.02	318630.49
51	7.09	1242361.20	318650.74
52	8.44	1242958.65	318736.82
53	25.95	1243004.21	318736.82
54	18.73	1242963.71	318777.32
55	23.45	1242771.31	318848.20
56	10.38	1242781.44	318863.39
57	41.06	1243090.29	319162.11
58	41.08	1243054.85	319192.49
59	62.05	1243064.97	319197.56
60	26.97	1243034.59	319212.75
61	11.89	1243697.86	319217.81
62	21.47	1242989.03	319238.06
63	287.18	1243591.53	319288.69
64	206.21	1243525.71	319329.20
65	222.22	1243510.52	319359.58
66	9.67	1242806.75	319384.89
67	53.66	1243363.69	319435.52
68	550.82	1243404.20	319435.52
69	409.74	1243272.56	319521.59
70	347.08	1243206.74	319546.91
71	14.93	1243014.34	319673.49
72	14.36	1243064.97	319673.49
73	520.77	1243768.74	319673.49
74	12.10	1243024.47	319688.68
75	1694.90	1243505.46	319815.25
76	19.31	1243464.96	319860.82
77	435.89	1243986.45	320002.59
78	59.01	1243900.38	320017.78
79	944.23	1243854.81	320068.41
80	1448.24	1243794.06	320098.79
81	804.31	1243768.74	320108.91
82	6.87	1244543.39	320129.17
83	27.86	1243713.05	320144.35
84	31.14	1243586.47	320159.54
85	51.30	1245090.21	320179.80
86	16.64	1245059.83	320220.30

87	10.10	1243505.46	320230.43
88	6.31	1244320.62	320260.81
89	76.61	1245064.89	320260.81
90	28.88	1245054.77	320276.00
91	30.06	1245034.51	320321.56
92	7.61	1245049.70	320331.69
93	428.98	1244026.96	320432.95
94	103.29	1245004.14	320432.95
95	52.37	1244963.63	320443.08
96	16.52	1244943.38	320473.46
97	12.54	1243930.76	320513.96
98	37.74	1245064.89	320529.15
99	8.20	1245196.53	320544.34
100	13.18	1243895.32	320549.40
101	56.59	1245009.20	320559.53
102	17.06	1245044.64	320559.53
103	40.95	1243804.18	320594.97
104	188.26	1244497.83	320594.97
105	17.46	1244462.39	320620.29
106	285.36	1244497.83	320620.29
107	18.58	1244887.68	320701.29
108	7.15	1244877.56	320751.93
109	7.64	1244366.19	320797.49
110	2052.46	1244153.54	320888.63
111	365.94	1244244.67	320898.76
112	1053.14	1244158.60	320908.88
113	58.76	1244249.74	320919.01
114	44.06	1244102.91	320924.07
115	66.20	1244062.40	320939.26
116	9.91	1245216.79	321081.03
117	101.96	1244553.52	321116.47
118	1034.17	1244563.65	321141.78
119	54.35	1244467.45	321167.10
120	92.91	1244421.88	321207.60
121	720.75	1244173.79	321344.31
122	1179.83	1244082.65	321374.69
123	20.25	1244123.16	321400.00
124	8.55	1245399.06	321405.06
125	6.40	1245343.36	321475.95
126	11.44	1245591.45	321799.99
127	19.93	1245535.76	321835.43
128	312.70	1244831.99	321840.49
129	14.28	1245485.13	321870.87
130	116.73	1246178.77	321875.93
131	47.72	1245505.38	321881.00
132	35.33	1246158.52	321896.18
133	19.16	1244730.73	321906.31

134	25.10	1244756.04	321916.44
135	24.34	1244705.41	321931.63
136	21.16	1244685.16	321946.82
137	22.73	1246031.94	321972.13
138	291.07	1244644.66	321982.26
139	24.23	1244609.21	321987.32
140	1540.84	1245282.61	321987.32
141	8.67	1244507.95	322017.70
142	6.70	1245966.12	322027.82
143	16.13	1244452.26	322068.33
144	8.32	1245920.56	322068.33
145	222.80	1245895.24	322073.39
146	389.50	1245895.24	322093.64
147	7.04	1247186.33	322144.28
148	511.51	1245221.85	322149.34
149	10.80	1247171.14	322164.53
150	124.67	1245059.83	322169.59
151	8.08	1245044.64	322174.65
152	663.86	1245150.97	322194.91
153	11.37	1247130.63	322199.97
154	78.80	1245414.25	322280.98
155	220.93	1247029.37	322291.11
156	719.11	1245459.81	322311.36
157	1261.20	1245530.70	322311.36
158	121.86	1246973.68	322311.36
159	7562.18	1245409.18	322321.48
160	857.32	1245475.00	322326.55
161	16.80	1246234.47	322331.61
162	447.33	1246968.62	322336.67
163	308.69	1245525.63	322341.74
164	419.92	1245358.55	322377.18
165	13.57	1246183.84	322382.24
166	144.77	1246057.26	322402.49
167	4107.49	1245363.62	322422.75
168	21.52	1246842.04	322422.75
169	360.30	1246037.01	322427.81
170	10.90	1246811.66	322448.06
171	128.47	1245257.29	322493.63
172	147.78	1245986.38	322498.69
173	504.49	1245267.42	322503.76
174	11.51	1245971.19	322518.94
175	20.58	1246685.08	322524.01
176	14.49	1245961.06	322529.07
177	148.20	1245191.47	322544.26
178	29.70	1245935.74	322544.26
179	1532.26	1245864.86	322574.64
180	7.22	1246533.19	322584.76

181	36.00	1245064.89	322599.95
182	520.96	1245809.17	322615.14
183	67.60	1245075.02	322620.21
184	365.56	1245753.47	322640.46
185	751.50	1244999.07	322675.90
186	28.23	1244943.38	322726.53
187	26.40	1245637.02	322736.66
188	69.34	1244902.87	322746.78
189	116.90	1244928.19	322751.85
190	35.09	1245637.02	322756.91
191	13.89	1245586.39	322767.04
192	2263.35	1245540.82	322787.29
193	962.82	1246295.22	322787.29
194	234.76	1245429.44	322863.23
195	9.68	1246153.46	322863.23
196	839.68	1245348.43	322923.99
197	10.86	1245885.11	323060.70

Note: Coordinates stated in NAD 83 Maryland State Plane in US Survey Feet.
Response stated in nanoteslas per two feet from Vertical Magnetic Gradient.

APPENDIX E
TABLE 13-1
EOD SCHOOL DEMOLITION AREAS - UXO 28
NAVAL SUPPPORT FACILITY
INDIAN HEAD, MARYLAND

Buried Ferrous Metallic Items			
Anomaly Number	**Response**	**Easting**	**Northing**
1	375.69	1249238.72	322719.64
2	105.11	1249208.56	322721.04
3	161.44	1249461.77	322721.04
4	225.49	1249404.25	322725.25
5	99.70	1249350.95	322725.95
6	1831.42	1249245.04	322729.46
7	50.48	1249216.98	322740.68
8	527.08	1249300.45	322742.78
9	4976.97	1249459.66	322762.42
10	81.69	1249296.94	322770.14
11	1484.73	1249228.90	322771.54
12	124.37	1249251.35	322787.67
13	535.84	1249294.13	322801.70
14	109.14	1249229.61	322803.10
15	332.40	1249456.16	322803.80
16	152.18	1249408.46	322808.01
17	409.92	1249505.26	322809.41
18	171.81	1249462.47	322813.62
19	330.41	1249294.84	322819.94
20	104.26	1249229.61	322820.64
21	124.88	1249414.07	322824.85
22	114.90	1249504.55	322825.55
23	59.77	1249229.61	322830.46
24	548.62	1249361.47	322831.16
25	89.52	1249411.97	322832.56
26	65.90	1249503.85	322833.96
27	86.46	1249359.36	322843.78
28	484.79	1249299.04	322845.89
29	442.94	1249504.55	322846.59
30	66.43	1249551.55	322862.72
31	227.14	1249303.25	322864.12
32	160.91	1249305.36	322883.76
33	189.11	1249857.36	322892.18
34	83.85	1249810.36	322897.09
35	211.41	1249307.46	322904.80
36	216.22	1249308.16	322913.22
37	439.96	1249308.86	322925.85
38	121.64	1249555.76	322925.85
39	198.17	1249510.87	322929.35

40	101.31	1249209.97	322932.16
41	69.72	1249455.46	322937.07
42	110.22	1249209.97	322939.17
43	362.28	1249310.27	322948.29
44	168.47	1249255.56	322948.99
45	166.77	1249755.65	322951.80
46	3120.26	1249602.75	322961.62
47	2116.34	1249629.40	322962.32
48	1244.96	1249611.87	322963.02
49	67.80	1249852.45	322963.02
50	324.66	1249310.97	322965.12
51	3031.10	1249638.52	322967.23
52	532.87	1249622.39	322970.74
53	1030.65	1249645.53	322971.44
54	1245.75	1249635.71	322972.84
55	64.56	1249259.06	322976.35
56	662.11	1249603.45	322977.05
57	456.72	1249646.24	322977.05
58	71.75	1249699.54	322978.45
59	142.72	1249794.93	322979.85
60	205.05	1249311.67	322985.46
61	91.32	1249362.87	322991.08
62	196.20	1249735.31	322993.18
63	1600.77	1249792.83	322993.18
64	221.85	1249311.67	322995.99
65	70.75	1249513.67	323001.60
66	2682.71	1249628.00	323005.81
67	101.79	1249787.92	323007.21
68	400.71	1249311.67	323008.61
69	503.09	1249775.99	323009.31
70	397.17	1249770.38	323010.72
71	74.13	1249707.96	323012.82
72	359.67	1249200.85	323021.24
73	282.74	1249715.67	323021.24
74	172.09	1249723.39	323026.15
75	1490.92	1249733.21	323028.25
76	2200.08	1249713.57	323028.95
77	117.41	1249746.54	323029.65
78	191.19	1249724.79	323030.35
79	1187.30	1249739.52	323033.16
80	497.27	1249703.75	323039.47
81	1207.17	1249256.96	323040.17
82	531.54	1249719.18	323040.17
83	352.69	1249753.55	323040.17
84	63.82	1249771.08	323040.17
85	334.99	1249706.56	323042.98
86	461.03	1249757.76	323043.68

87	362.18	1249729.70	323045.79
88	73.58	1249313.77	323047.19
89	480.11	1249742.33	323050.69
90	1849.99	1249682.71	323051.40
91	250.46	1249729.00	323053.50
92	94.91	1249311.67	323054.90
93	282.60	1249723.39	323059.81
94	430.69	1249781.61	323059.81
95	112.28	1249851.04	323064.02
96	2504.90	1249709.36	323065.42
97	51.79	1249400.75	323066.13
98	486.78	1249736.72	323068.93
99	56.18	1249768.28	323068.93
100	52.05	1249848.24	323068.93
101	99.91	1249783.71	323071.04
102	154.22	1249203.45	322996.58
103	360.58	1249260.75	322993.16
104	324.97	1249247.92	322774.24
105	605.32	1249413.82	322771.68
106	247.55	1249460.85	322700.70
107	137.98	1249509.60	322767.40
108	231.72	1249560.91	322972.64
109	678.10	1249603.66	322948.69
110	122.67	1249403.56	322705.83

Note: Coordinates stated in NAD83 Maryland State Plane in US Survey Feet.
Response stated in Analytic Signal from Vertical Magnetic Gradient data.

APPENDIX E
TABLE 13-1A
EOD SCHOOL DEMOLITION AREAS - UXO 28
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Buried Metallic Items			
Anomaly Number	Response	Easting	Northing
1	3281.61	1249641.00	322972.50
2	69.58	1249657.50	322974.75
3	3.44	1249782.75	322979.25
4	6.99	1249655.25	322983.00
5	6.85	1249773.75	322983.00
6	4.87	1249739.25	322985.25
7	135.56	1249620.75	322989.00
8	2.87	1249707.75	322992.00
9	3.16	1249710.00	322992.00
10	5.01	1249635.00	322993.50
11	4706.91	1249782.00	322997.25
12	5.19	1249773.75	322998.00
13	4.30	1249771.50	322998.75
14	12.68	1249745.25	322999.50
15	3.57	1249770.00	322999.50
16	51.97	1249613.25	323000.25
17	74.97	1249624.50	323010.00
18	55.58	1249741.50	323010.75
19	43.48	1249755.00	323014.50
20	8.02	1249730.25	323019.75
21	18.70	1249745.25	323019.75
22	26.49	1249709.25	323022.75
23	6.04	1249674.00	323023.50
24	7.06	1249698.75	323023.50
25	76.96	1249623.00	323025.00
26	9.33	1249695.00	323025.00
27	67.89	1249755.75	323026.50
28	63.80	1249707.75	323031.75
29	235.41	1249719.00	323031.75
30	47.65	1249736.25	323033.25
31	2.80	1249633.50	323038.50
32	24.75	1249705.50	323038.50
33	165.59	1249752.75	323042.25
34	351.88	1249779.75	323043.00
35	187.26	1249775.25	323043.75
36	3.99	1249755.00	323051.25
37	21.03	1249713.00	323052.00
38	114.18	1249701.00	323053.50
39	29.96	1249731.00	323053.50

40	13.47	1249740.00	323053.50
41	9.71	1249770.75	323054.25
42	105.90	1249677.00	323057.25
43	113.48	1249702.50	323058.00
44	85.80	1249706.25	323058.00
45	17.86	1249728.00	323058.75
46	21.80	1249758.00	323061.00
47	263.57	1249713.00	323064.00
48	509.70	1249720.50	323064.00
49	665.95	1249776.75	323064.00
50	1060.65	1249764.00	323067.75
51	1198.98	1249702.50	323070.00
52	53.72	1249725.00	323070.75
53	8.58	1249738.64	322985.66
54	10.35	1249767.60	322974.35
55	10.10	1249670.54	322968.69
56	57.57	1249602.66	322987.24
57	121.63	1249754.25	323045.39

Note: Coordinates stated in NAD 83 Maryland State Plane in US Survey Feet.
Response stated in millivolts from EM61.

UXO 28 – EOD School Demolition Areas
NSF Indian Head Stump Neck
Indian Head, Maryland

Photograph 1: EM61 with GPS mounted on top.

Photograph 2: G-858G magnetometer with GPS mounted above operator.

Photograph 3: G-856 magnetometer base station.

APPENDIX F

MC SI FIELD FORMS
(ON CD)

APPENDIX F – LIST OF FORMS

APPENDIX F.1 - BORING LOGS

APPENDIX F.2 - SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 01

APPENDIX F.3 - SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 02

APPENDIX F.4 - SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 04

APPENDIX F.5 - SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 05

APPENDIX F.6 - SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 10

APPENDIX F.7 - SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 12

APPENDIX F.8 - SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 21

APPENDIX F.9 - SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 23

APPENDIX F.10 - SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 28

APPENDIX F.11 - GROUNDWATER SAMPLE LOG SHEETS – UXO 02

APPENDIX F.12 - GROUNDWATER SAMPLE LOG SHEETS – UXO 04

APPENDIX F.13 - BACKGROUND HYDROGEOLOGY INFORMATION

APPENDIX F.14 - MONITORING WELL INSPECTION SHEETS

APPENDIX F.15 - MONITORING WELL SCHEMATICS

APPENDIX F.16 - PID CALIBRATION LOGS

APPENDIX F.17 - WATER METER CALIBRATION LOGS

APPENDIX F.18 - TURBIDITY METER CALIBRATION LOGS

APPENDIX F.19 - WELL DEVELOPMENT LOGS

APPENDIX F.20 - EQUIPMENT INSPECTION

APPENDIX F.21 - SITE SPECIFIC TRAINING

APPENDIX F.22 - EXPLOSIVE SAFETY SUBMISSION DETERMINATION REQUEST

APPENDIX F.23 - CLASS A WORK APPROVAL PERMIT

APPENDIX F.24 - SOPS LIST

APPENDIX F.25 - FIELD BOOK 1

APPENDIX F.26 - FIELD BOOK 2

APPENDIX F.1

BORING LOGS

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: XOSSB001
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/Tan	Moist, V.F.-Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5												
	3												
	3.5												
	4												
	4.5					Rust/Tan	Moist, V.F.-Fine Clayey Sand						
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 + 4-6 Samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X055B002
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Vivonex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/	Moist, V.F. Fine Sandy						
	1					tan	Clay						
	1.5												
	2												
	2.5												
	3												
	3.5		100%										
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 & 4-6' samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: XX DPT or ( ) Hand Auger

BORING No.: X05SB03
DATE: 3/14/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	V. Fine-Fine Sandy Silt						
	1												
	1.5					Rust/Tan	Moist, V.F.-Fine Sandy Clay						
	2												
	2.5												
	3												
	3.5												
	4		80#/5										
	4.5												
	5												
	5.5		50#/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X05SB004
DATE: 3/14/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	Moist, V.f-Fine Sandy Silt						
	1												
	1.5					Tan	Moist, V.f-Fine Sandy Clay						
	2												
	2.5												
	3												
	3.5		60"/5										
	4												
	4.5												
	5												
	5.5		8.0"/1			Tan	"						
	6					Gray	Hard Gray Clay Moist						

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: XOSSB005
DATE: 3/15/16
GEOLOGIST: EB
DRILLER: Tronex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	PID/FID Reading (ppm): Sampler BZ	PID/FID Reading (ppm): Borehole**	PID/FID Reading (ppm): Driller BZ**
	0.5					Dbrown	V.F-Fine Sandy Silt Moist						
	1												
	1.5					Rust/Tan	Moist, V.F.-Fine Sandy clay						
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4+4-6' samples

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: ____
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X05SB006
DATE: 3/15/10
GEOLOGIST: EQ
DRILLER: Virdex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	Moist, V.F-Fine sandy Silt						
	1												
	1.5					Rust/ Tan	Moist, V.F-Fine ~~Clayey~~ Sandy Clay Sand						
	2												
	2.5												
	3												
	3.5												
	4												
	4.5					Rust/ Tan	Moist, V.F-Fine Clayey Sand						
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X05SB007
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Vtrnek

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5				Rusty	Moist, V.F.-Fine							
	1					Tan	Sandy Clay						
	1.5												
	2												
	2.5												
	3												
	3.5		1.6ft										
	4												
	4.5												
	5												
	5.5						Saturated at 5.5						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 & 4-6' Samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: XOSSB008
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: VirneX

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	PID/FID Reading (ppm): Sampler BZ	PID/FID Reading (ppm): Borehole**	PID/FID Reading (ppm): Driller BZ**
	0.5					Rust/ Tan	Moist, V.F. Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5		100%										
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6						Wet at 5.5'						

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2 4 4 6 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X05SB009
DATE: 3/14/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Orange	Sandy · Fill Material						
	1												
	1.5												
	2												
	2.5					Clay/ Tan	Moist, V.F.-Fine Sandy clay						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5					Gray/ Tan	Moist, Hard clay						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 + 4-6 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: XX DPT or ( ) Hand Auger

BORING No.: X055B010
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D.Brown/ Orange	V.F.-Fine Sandy Silt and Fill Material						
	1												
	1.5					Rust/ tan/ Brown	Moist, V.F-Fine Sandy Clay						
	2												
	2.5												
	3		80%/5										
	3.5												
	4												
	4.5					Rust/ Brown/ Tan	Wet, V. Fine-Fine Clay Sand						
	5												
	5.5		60%/1			Gray	Hard Clay						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 2-4+4-6' Samples

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X05SB011
DATE: 3/15/10
GEOLOGIST: ER
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	PID/FID Reading (ppm): Sampler BZ	PID/FID Reading (ppm): Borehole**	PID/FID Reading (ppm): Driller BZ**
	0.5					Orange Brown	V.F. Fine Moist Sandy Silt and Orange Sand Fill Material						
	1												
	1.5												
	2												
	2.5					Tan/Rust	Moist, V.F. Fine Sandy Clay						
	3												
	3.5												
	4												
	4.5					Gray	Moist, Hard Clay						
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 + 4-6' samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X055B12
DATE: 3/14/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Tan	Moist, Vf.-Fine Sandy clay						
	1												
	1.5												
	2												
	2.5												
	3												
	3.5		40 4/5										
	4												
	4.5												
	5												
	5.5		50 1/1			Rust/ Tan	Wet, Vf.-Fine clayey Sand with pebbles						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X05SB013
DATE: 3/14/16
GEOLOGIST: EB
DRILLER: Vraney

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Dk Brown	Moist, V.f-Fine clayey						
	1						Silt						
	1.5					Tan	Moist, V.f. Fine Clayey Sand						
	2												
	2.5		60P/5										
	3												
	3.5												
	4												
	4.5												
	5												
	5.5		60P/1			Tan	Saturated V.f-f Clayey Sand						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 244 + 46-

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ~~X~~ DPT or ( ) Hand Auger

BORING No.: X05SB014
DATE: 3/14/10
GEOLOGIST: EB
DRILLER: VVoney

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	Moist, V.F.-Fine Sandy Silt						
	1												
	1.5					Tan	V.F.-Fine sandy Clay						
	2												
	2.5												
	3		80%										
	3.5												
	4												
	4.5												
	5												
	5.5		40%			Tan	wet, Fine-Med clayey sandy w/ Fgh pebbles						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 24 46

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ⊠DPT or ( ) Hand Auger

BORING No.: X055B015~~026~~
DATE: 3/14/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	Moist, V.f-Fine Sandy Silt w/ Pebbles						
	1												
	1.5					Tan/ Rust	Moist, V.f.-Fine ~~Clay~~ Sandy Clay.						
	2												
	2.5		60"/5										
	3												
	3.5												
	4												
	4.5					Tan/ Rust	Moist to Wet V.f-Fine Clayey Sand						
	5												
	5.5		60"/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: Q4 & 4.6 Samples

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XQ5SB016
DATE: 3/14/10
GEOLOGIST: E.B.
DRILLER: Vivaldi

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/Tan/Grey	Moist, V.F-Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5												
	3												
	3.5												
	4		4.0/5										
	4.5												
	5												
	5.5		3.0/5										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks: _____

Converted to Well: Yes ____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X05SB017
DATE: 3/14/10
GEOLOGIST: PB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D Brown	Moist, V.F.- Fine clayey silt						
	1												
	1.5					Rust Brown	Moist, V.F.- Fine Sandy clay						
	2		70%										
	2.5												
	3												
	3.5												
	4												
	4.5					Rust Brown	Wet, V.F.- Fine Clayey Sand						
	5												
	5.5		70%										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 +4-6' Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X05SB018
DATE: 3/14/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D Brown	Moist, V.F.-Fine Sandy Silt						
	1												
	1.5					Tan	Moist, V.F.-Fine						
	2						Sandy Clay						
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5						Saturated, V.F-Fine Clayey Sand w/ pebbles						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XDS SB019
DATE: 3/14/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					DBrown	Moist, V.F.-Fine Clayey Silt						
	1												
	1.5					Tan	Moist, V.F.-Fine Sandy clay						
	2	5/4/5											
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5	4/4/1				Tan	Saturated, V.F.-Fine Clayey Sand w/pebbles						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 + 4-6' samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: XOSSB020
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Virchez

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/Tan	Moist, V.F. - F Fine Clayey Sand						
	1												
	1.5												
	2												
	2.5					Rust Tan	Moist, V.F. - Fine Sandy Clay						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6					Clay	Saturated Hard Clay						

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 + 4-6 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X055B021
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Virtue

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/Tan	Moist, Vf-f sandy Clayey Sand						
	1												
	1.5												
	2												
	2.5												
	3												
	3.5		100%										
	4												
	4.5												
	5												
	5.5		100%			Gray	Saturated, Vf-fine sandy clay						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ☐

Remarks: _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X05SB022
DATE: 3/14/10
GEOLOGIST: E.B.
DRILLER: Vivimex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D Brown	Moist, V.F.-Fine Sandy Silt						
	1												
	1.5												
	2												
	2.5		60"/15			Rust/ Tan	Moist, V.F.-Fine Sandy Clay						
	3												
	3.5												
	4												
	4.5					Rust	Wet, V.F.-Fine Clayey Sand with Pebbles						
	5												
	5.5		54"/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No ✓ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ~~X~~ DPT or ( ) Hand Auger

BORING No.: X05SB023
DATE: 3/14/10
GEOLOGIST: E.B.
DRILLER: Virones

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	V.f. Fine Sandy Silt with organics, Moist						
	1												
	1.5												
	2												
	2.5					Rust/ Brown/ Gray	Moist, V.f.-Fine Sandy Clay						
	3												
	3.5		60"/5										
	4												
	4.5												
	5												
	5.5		40"/1			Rust/ Brown/ Tan	Wet, V.f.-Fine Clayey Sand with pebbles.						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X055B024
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Vranex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Red	V.F-Med Clayey						
	1						Sand/ With						
	1.5						pebbles + Stones -						
	2						Fill Material						
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 +4-6' samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X05SB025
DATE: 03/15/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/	Moist, V.F-Fine						
	1					Tan	Sandy Clay						
	1.5												
	2												
	2.5												
	3												
	3.5		100%										
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 & 4-6' samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X01SB002 0204
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	V.F-Fine, Moist Sandy Silt						
	1						With organics						
	1.5												
	2												
	2.5					Tan	V.F-Fine, Moist Sandy Clay						
	3												
	3.5					Tan Clay	Moist, Hard clay						
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks: 2-4' Sample

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: /
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X01SB003
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D Brown	Moist, V.F. Fine ~~Sandy Clayey~~ Silt						
	1												
	1.5					Tan/ Gray	Moist, V.F. Fine Sandy Clay						
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 2-4' Sample

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XA15B01102004
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: Vivonex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					DBrown	Moist, V.F-Fine Sandy Silt						
	1												
	1.5					Tan	Moist, V.F-Fine Sandy Clay						
	2												
	2.5		60"/4			Tan	Moist, V.F-Fine Clayey Sand						
	3												
	3.5					Tan	Moist, V.F-Fine Sandy Clay						
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24' Sample

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X01SB012
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: VironeX

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	Moist, Vf-Fine						
	1						Clayey Silt						
	1.5					Tan/	Moist, Vf-Fine						
	2					Rust	Clayey Sand						
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' Sample

Drilling Area Background (ppm):

Converted to Well: Yes ___ No X Well I.D. #: ___

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XQ1SB018
DATE: 3/16/16
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	PID/FID Reading (ppm): Sampler BZ	PID/FID Reading (ppm): Borehole**	PID/FID Reading (ppm): Driller BZ**
	0.5					D. Brown	Moist, V.F.-Fine clayey sandy Silt						
	1						with organics						
	1.5					Tan/	Moist, V.F.-Fine						
	2		70%/4			Rust	Clayey Sand						
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' sample

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: XA15B01R
DATE: 3/16/16
GEOLOGIST: EB
DRILLER: Vivanox

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	Moist, V.F. Fine Sandy Silt						
	1												
	1.5					Tan/ Rust/ Gray	Moist, V.F. Fine Clayey Sand						
	2												
	2.5												
	3												
	3.5					Tan/ Rust/ Gray	Moist, V.F. Fine Sandy Clay						
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' Sample

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: Vironex
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X12SB001
DATE: 3/10/10
GEOLOGIST: Ellen Berkhire
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
			5										
	0.5	NA				Dark Brown	Moist, Brown Sandy Silt						
	1												
	1.5												
	2												
	2.5		50%/5			Rust Tan	Sandy Clay, Wet						
	3						trace organics						
	3.5												
	4												
	4.5												
	5												
	5.5		75%/1			Olive Green	Wet, Clayey Sand						
	6						Saturated at 5.5'						

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: Collected Samples at 2-4' and 4-6'

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X12SB002
DATE: 3/10/10
GEOLOGIST: Ellen Berkhite
DRILLER: Tronex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	Moist VF-F Sandy Silt						
	1												
	1.5												
	2												
	2.5												
	3						Moist, VF-Fine Sandy Clay						
	3.5	10/9/5				Rust Brown							
	4												
	4.5												
	5												
	5.5	8/9/6											
	6					Green	Moist VF-Fine Sandy Clay						

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 +4-6 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X12SB003
DATE: 3/10/10
GEOLOGIST: Ellen Berklite
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	Moist, Sandy Silt						
	1												
	1.5												
	2												
	2.5					Rust Tan	VF-F Sandy Clay, Moist						
	3												
	3.5		60/5										
	4												
	4.5												
	5												
	5.5		60/1			Gray	VF-M Clayey Sand, Wet W/ pebbles						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 & 4-6' Samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XSB004
DATE: 3/10/10
GEOLOGIST: Ellen Berthiaume
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5												
	1												
	1.5												
	2					Dk Brown	Moist, Sandy Silt						
	2.5												
	3					Rust Brown	Moist, VF-F Sandy Clay						
	3.5	5	4/5										
	4												
	4.5												
	5												
	5.5	3	1/1			Gray	Moist, VF-F Clayey Sand						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' + 4-6' Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: Vironex
DRILLING RIG: ( ) DPT or ( ) Hand Auger

BORING No.: X12SB005
DATE: 3/10/10
GEOLOGIST: Ellen Berthoe
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	Moist, Brown Sandy Silt Some organics						
	1												
	1.5												
	2												
	2.5		75%/5			Rust Tan	Sandy Clay, Moist						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5		100%/1			Olive Green	Moist, Clayey Sand						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: collected samples at 24' and 46'

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X12SB006
DATE: 3/10/10
GEOLOGIST: Ellen Berkhite
DRILLER: Vivarex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	VF-F Sandy Silt, Moist						
	1												
	1.5												
	2		1.0/5										
	2.5					Rust Tan	VF-F Sandy Clay, Moist						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5		1.5/1			Green Gray	Clayey, VF-F Sand, Moist						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X12SB007
DATE: 3/10/10
GEOLOGIST: EB
DRILLER: Virone

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5				Dark Brown		Moist, Brown-Green Sandy Silt some organics						
	1												
	1.5												
	2		100%										
	2.5		5		Rust tan		Sandy Clay, Moist						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5				Gray Brown		Saturated, Clayey Sand						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: Collected samples at 2' and 4-6'

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: [X] DPT or [ ] Hand Auger

BORING No.: X12SB006
DATE: 3/10/10
GEOLOGIST: EB
DRILLER: Virone

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5						D. Brown, Moist Sandy Silt						
	1												
	1.5												
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5					Gray	Clayey Fine Sand w pebbles, Moist						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 4-6' samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ___ No [X] Well I.D. #: ___

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X12SB009
DATE: 3/6/12
GEOLOGIST: Ellen Berkhite
DRILLER: Vivenes

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	Sandy/Silt						
	1												
	1.5												
	2												
	2.5					Rust Brown	VF Fine Sandy clay Moist						
	3		30/5										
	3.5												
	4												
	4.5												
	5												
	5.5		50/1			Gr. Gray	VF-Med Sand, Wet some clay						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' + 4-6' Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: N25B010
DATE: 3/10/10
GEOLOGIST: EB
DRILLER: Vibrocore

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D.Brown	VF-F Sandy Silt, Moist						
	1												
	1.5												
	2												
	2.5					Rust Brown	VF-F Sandy Clay, Moist						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5				Green-Brown		Wet Well graded VF-Med. Sand						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: XM SB001
DATE: 03/16/16
GEOLOGIST: EB
DRILLER: Virgnex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/	Moist, VF Sandy Clay						
	1					Tan							
	1.5												
	2												
	2.5												
	3		80% / 5										
	3.5												
	4												
	4.5					Rust/	Moist / V.F-Fine						
	5					Tan	Clayey Sand						
	5.5		80% / 1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 4-6 Samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XB45B002
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: UTronex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Tan	Moist, V.F.-Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5												
	3		60"/4										
	3.5												
	4												
	4.5					Rust/ Tan	Moist, V.F.-Fine Clayey Sand						
	5												
	5.5		60"/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4-4-6

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XH58003
DATE: 3/17/16
GEOLOGIST: EB
DRILLER: Utronex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan	Moist Sandy Silt						
	1												
	1.5												
	2												
	2.5					Tan/Rust	Moist, V.F-Fine Clayey Silt						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2.4+4-6

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X04SB004
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: VTronex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Tan	Moist, V.F.-Fine Sandy clay						
	1												
	1.5												
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5					Rust/ Tan	Moist, V.F.-Fine clayey Sand						
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks: 24446

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X14SB015
DATE: 3/16/16
GEOLOGIST: EB
DRILLER: Nronex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Tan	Moist, V.F.-Fine sandy clay						
	1												
	1.5												
	2												
	2.5												
	3		60/5										
	3.5												
	4												
	4.5												
	5					Rust/ Tan	Moist, V.F. Fine clayey Sand						
	5.5		30/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks: 24 HR

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ~~X~~ DPT or ( ) Hand Auger

BORING No.: X04SB006
DATE: 3/16/10
GEOLOGIST:
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Tan	Moist, V.F. Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5		70/5										
	3												
	3.5												
	4												
	4.5					Rust/ Tan	Moist V.F. Fine Clayey Sand						
	5		50/1										
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24+46

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ~~SPT~~ or X Hand Auger

BORING No.: XHSB~~12~~007
DATE: 3/17/16
GEOLOGIST: EB
DRILLER: Virshex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Tan	Moist, V.F-Fine sandy Clay						
	1												
	1.5												
	2		WOH										
	2.5					Tan/ Gray	Moist, Hard Clay						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5		WOH										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 & 4-6 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: XB45B008
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: V Trahey

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Tan	MOIST, VF-F'ne Sandy						
	1						Clay						
	1.5												
	2												
	2.5												
	3												
	3.5												
	4		0.5/5										
	4.5												
	5												
	5.5		1.0/1			Gray	Hard Clay, MOIST						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks: 2+4+6

Converted to Well: Yes ___ No X Well I.D. #: ___

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X845B009
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan/	Moist, V.F. Fine						
	1					Gray	Sandy Clay						
	1.5												
	2												
	2.5		Loose										
	3												
	3.5												
	4												
	4.5		Coop			Tan/	Moist, Hard Clay						
	5					Gray							
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks: 24+46

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X04SB010
DATE: 3/16/10
GEOLOGIST: E.B
DRILLER: Virotex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown/ Tan	Moist, V.F.-Fine Sandy Silt						
	1												
	1.5												
	2												
	2.5					Rust/ Tan	Moist, V.F.-Fine Clayey Sand						
	3												
	3.5												
	4												
	4.5					Rust/ Tan	Moist, V.F.-Fine Sandy Clay						
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ☐

Remarks: _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X04SB011
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan/ Rust	Moist, V. Fine-Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5		80%										
	3		5										
	3.5												
	4												
	4.5					Tan/ Clay	Moist, Hard Clay						
	5		100%/1										
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' & 4-6'

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XOH SB0012
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: VIRONEX

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	Clayey Silt, Moist						
	1												
	1.5					Tan/ Rust	Moist, V.f.-Fine Sandy Silt						
	2		6"/5										
	2.5												
	3												
	3.5												
	4					Tan/ Rust	Moist, V.f.-Fine Clayey Sand						
	4.5												
	5												
	5.5		6"/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 & 4-6 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: XD4SB013
DATE: 3/17/10
GEOLOGIST: EB
DRILLER: Vanex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan	Moist, V.F.-Fine						
	1						Sandy Clay						
	1.5												
	2												
	2.5		5ft/5										
	3												
	3.5												
	4												
	4.5												
	5												
	5.5		5ft/1										
	6												
								*					

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 hrs

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X04SB014
DATE: 3/17/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan/ Rust	Moist, Vf-Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5		100%/5			Tan/ Rust	Moist, Hard Clay						
	3												
	3.5												
	4												
	4.5					Tan/ Rust	Moist, Vf-Fine Sandy Clay						
	5		80%/1										
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 2-4 + 4-6

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X45B015
DATE: 3/17/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Tan	Moist, V.F.-Fine Clayey Sand						
	1												
	1.5												
	2												
	2.5					Gray/ Tan	Moist, Hard Clay						
	3		100%										
	3.5												
	4												
	4.5					Rust/ Tan	Moist, V.F.-Fine Sandy Clay						
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2+4-6'

Drilling Area Background (ppm):

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X04SB016
DATE: 3/17/16
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan/Rust	Moist, VF-Fine Clayey Sand						
	1												
	1.5												
	2												
	2.5					Tan/Gray	Moist, ~~VF-Fine~~ Hard Clay						
	3												
	3.5												
	4												
	4.5					Tan/Rust	Moist, VF-Fine Sandy Clay						
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4+4-6 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X04SB017
DATE: 3/17/16
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan	Moist, U.F.-Fine						
	1						Sandy Clay						
	1.5												
	2												
	2.5												
	3												
	3.5												
	4		80% / 1										
	4.5					WET							
	5					Tan							
	5.5		80% / 1			Moist - U.F.-Fine Sand							
	6					Tan							

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 2+4+46

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: XD45B01B
DATE: 3/16/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Red/	Moist, VF-F sandy						
	1					Tan/	clay						
	1.5												
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5					Gray							
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24-24-6

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XQ45B019
DATE: ~~3/16/10~~ 3/17/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	MOB+y V.F.-Fine Sandy Silt						
	1					Tan	With pebbles						
	1.5						Moist V.F.-Fine						
	2		48"/5			Tan	Sandy Clay						
	2.5					Rust							
	3												
	3.5												
	4												
	4.5												
	5												
	5.5		50"/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2+4+6

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: XM-SB020
DATE: 3/17/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Tan	Moist, V.F-Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5						Moist, Hard Clay						
	3		60%/1										
	3.5												
	4												
	4.5					Rust/ Tan	Moist, V.F-Fine Sandy Clay						
	5		80%/1										
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 2+4+6

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: XX DPT or ( ) Hand Auger

BORING No.: X235B001
DATE: 3/11/10
GEOLOGIST: EB
DRILLER: Vranos

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5												
	1				D. Brown		Moist, VF-Fine Sand, Silt						
	1.5												
	2												
	2.5					Rust Brown	Moist, VF Fine Sandy Clay						
	3												
	3.5												
	4												
	4.5		60"/5										
	5												
	5.5		60"/1			dark Green Gray	Moist, VF Fine Sandy Clay						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 of 46 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: XX DPT or ( ) Hand Auger

BORING No.: X23SB002
DATE: 3/11/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Dk Brn	Moist, Sandy Silt						
	1												
	1.5												
	2												
	2.5					Rust/ Brown/ Gray	Moist, VF-Fine Sandy Clay						
	3												
	3.5												
	4		100%/5										
	4.5												
	5												
	5.5		100%										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 24 24-6 Samples

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X235B003
DATE: 3/11/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	PID/FID Reading (ppm): Sampler BZ	PID/FID Reading (ppm): Borehole**	PID/FID Reading (ppm): Driller BZ**
	0.5					Brown	Moist, Sandy Silt						
	1												
	1.5												
	2												
	2.5					Rust Brown	Moist, VF-Fine Sandy Clay						
	3												
	3.5												
	4		4.0ft/5										
	4.5												
	5												
	5.5		6.0ft/6										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): [ ]

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X23SB004
DATE: 3/11/10
GEOLOGIST: EB
DRILLER: Virones

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Dk Brown	Sandy Silt, organics						
	1												
	1.5					Rust Brown	VF-Fine Sandy Clay						
	2												
	2.5												
	3												
	3.5		60/5										
	4												
	4.5												
	5												
	5.5		7.0/1				Saturated @ 5.5						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 of 46 samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X23SB005
DATE: 8/11/10
GEOLOGIST: EB
DRILLER: VTOhex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D.Brown	M/St, V.F-F Sandy Silt w/ Organics						
	1												
	1.5												
	2		60/5										
	2.5					Rust Brown	M/St, VF-F Sandy Clay						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5		50/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X2358006
DATE: 3/11/16
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	Sandy Silt, Moist						
	1												
	1.5												
	2												
	2.5					Light Brown	Moist, VF-F Sandy Clay						
	3												
	3.5												
	4												
	4.5		100%/5										
	5												
	5.5		50%/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 ft bgs Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X23SB007
DATE: 3/11/10
GEOLOGIST: EB
DRILLER: Virotex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5				D. Brown		Moist, Sandy Silt						
	1												
	1.5												
	2												
	2.5				Red Brown		Moist, VF-F Sandy Clay						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5				Brown Gray		Moist, VF-F Sandy Clay w/ pebbles						
	6						Saturated at 6						

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' & 4-6' Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: (X) DPT or ( ) Hand Auger

BORING No.: X23SB008
DATE: 3/11/10
GEOLOGIST: EB
DRILLER: Virnes

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	Moist VF-F Sandy Silt						
	1												
	1.5												
	2												
	2.5					Rust Brown	Moist, VF-F sandy Clay						
	3												
	3.5		60/5										
	4												
	4.5												
	5												
	5.5		48/1			Brown Gray	Moist, VF-F Sandy Clay, some pebbles						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks: 2 / 4' Samples

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: Vironex
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X23SB090204
DATE: 3-11-10
GEOLOGIST: EB
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					rust/ brn	0-5' Moist, VF-F, Sandy clay						
	1												
	1.5												
	2												
	2.5												
	3												
	3.5												
	4						4-6' Moist, VFF, Sandy clay						
	4.5					mottled grey	w/ some pebbles						
	5		75%/5										
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ____ No ✓ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ☒ DPT or ( ) Hand Auger

BORING No.: X235B010
DATE: 3/11/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust Brown	V.F-F Sandy Clay, Moist						
	1												
	1.5												
	2												
	2.5		15 4/5										
	3												
	3.5												
	4												
	4.5												
	5												
	5.5		10 4/1										
	6					Gray	Saturated at 5.5' Gray Sandy Clay w/ pebbles						

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 & 4-6' sample 1

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: XX DPT or ( ) Hand Auger

BORING No.: X025B001
DATE: ~~X025B0~~ 3/12/10
GEOLOGIST: EB
DRILLER: Vivonex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Dk Brn	Vi Fine-Fine Sandy Silt						
	1												
	1.5					Red/	V. Fine-Fine Sandy Clay						
	2					Gray/							
	2.5					Tan							
	3												
	3.5		70%/5										
	4												
	4.5												
	5												
	5.5		50%/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' and 4-6' Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: ___
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X025B002
DATE: 3/12/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	Moist, V.F.-Fine Sandy Silt						
	1												
	1.5					Rust/ Tan	Moist, V.F.-Fine Sandy Clay						
	2												
	2.5												
	3		60"/5										
	3.5												
	4												
	4.5												
	5												
	5.5		60"/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' and 4-6' samples

Drilling Area Background (ppm): ___

Converted to Well: Yes ___ No X Well I.D. #: ___

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: XX DPT or ( ) Hand Auger

BORING No.: X02SB003
DATE: 3/12/16
GEOLOGIST: EB
DRILLER: Virones

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D. Brown	Moist, VF-Fine Sandy Silt						
	1												
	1.5					Rust/ Gray	Moist, VF-Fine Sandy Clay						
	2												
	2.5												
	3												
	3.5												
	4												
	4.5					Gray	Moist, Hard Clay						
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 of 46 Samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X12SB005
DATE: 3/12/10
GEOLOGIST: EB
DRILLER: Virney

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D.Brown	V.F-Fine Sandy Silt Moist/Wet						
	1												
	1.5					Gray to Rust	Moist, V.F-Fine Sandy Clay						
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5					Rust							
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 2-4' & 4-6' Samples

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or ( ) Hand Auger

BORING No.: XQ2SB006
DATE: 3/12/10
GEOLOGIST: EB
DRILLER: Virohey

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Gray/	Moist, VF-Fine Sandy						
	1					Tan/	clay						
	1.5					Rust							
	2												
	2.5												
	3												
	3.5		70%										
	4												
	4.5												
	5												
	5.5		50%										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks: 2-4 & 4-6' samples

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: XQ2SB027
DATE: 3/12/10
GEOLOGIST: ER
DRILLER: Vrchex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	Moist, VF-Fine Sandy Silt						
	1												
	1.5					Tan/ Rust	Vf Fine-Fine Sandy (Moist) Clay						
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5					Green	wet Vf Fine-Fine						
	6						Slightly Clayey Sand						

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24' and 46' Samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ___ No X Well I.D. #: ___

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X02SB108
DATE: 3/12/10
GEOLOGIST: EB
DRILLER: Virgines

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	VF-Fine Sandy Silt Moist						
	1												
	1.5												
	2												
	2.5					Rust/ Gray	Moist, Hard Clay						
	3												
	3.5		100%										
	4		5										
	4.5					Rust	Moist, V.Fine-Fine Clayey Sand						
	5												
	5.5		100%										
	6		1										

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 + 4D Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X02SB009
DATE: 3/12/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan Brown	Moist, VF Fine Sandy Silt						
	1												
	1.5					Rust Brown	Moist, VF F Sandy Clay						
	2												
	2.5												
	3												
	3.5		5.0/5										
	4												
	4.5												
	5												
	5.5		5.0/1										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4' + 4-6' samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X02SB010
DATE: 3/12/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5												
	1												
	1.5				D.Brown		Moist, VF-Fine Sandy Silt						
	2												
	2.5				Rust Brown		Moist, VF-Fine Sandy Clay						
	3		40#/5										
	3.5												
	4												
	4.5												
	5												
	5.5		30#/1		White		Moist, VF-Fine Clayey Silt with pebbles						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: 2-4 & 4-6 Samples

Converted to Well: Yes _____ No _____ Well I.D. #: _____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X02SB012
DATE: 3/13/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan	Moist, V.F.-Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												
	7												
	8												
	9					D. Brown	Moist, V.F.- Fine Sandy Clay						
	10												
						Tan	Moist, V.F.- Fine Clayey Sand saturated at 12'						
T.D.	20'												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm):

Remarks:

Converted to Well: Yes X No Well I.D. #: X02TW03

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X02P016
DATE: 3/2/16
GEOLOGIST: EB
DRILLER: Vinnex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust Brown Gray	Moist, V.F.-Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5												
	3		100% / 5										
	3.5												
	4												
	4.5												
	5												
	5.5		80% / 4										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4 & 4-6

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ~~X~~DPT or ( ) Hand Auger

BORING No.: XDSB018
DATE: 3/2/10
GEOLOGIST: EB
DRILLER: Viranex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown	Moist, V.F. Fine Sandy Silt						
	1					Gray							
	1.5					Rusty Brown	Moist, V.F. Fine Sandy Clay						
	2												
	2.5												
	3		4.0/5										
	3.5												
	4					Rust Brown							
	4.5					Rust Brown	Moist, V.F.-Fine Clayey Sand						
	5												
	5.5		3.0/4										
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2-4-4-6 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X02SB024
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Brown/	Moist, V.F.-Fine						
	1					Tan	Sandy Silt						
	1.5					Rust/	Moist, V.F.-Fine						
	2					Tan	Clayey Sand						
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2+4+4+6 Samples

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ~~X~~ DPT or ( ) Hand Auger

BORING No.: XQ25B16
DATE: 3/12/10
GEOLOGIST: ~~[illegible]~~ Vivarex
DRILLER: EB

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5				Lt Brown		Moist, V.F. Fine Sandy Silt						
	1												
	1.5				Rust/		Moist, V.F.-Fine						
	2				Tan		Sandy Clay						
	2.5												
	3												
	3.5												
	4												
	4.5												
	5						Saturated at 5'						
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 244 +4 ✓

Drilling Area Background (ppm): [ ]

Converted to Well: Yes ___ No X Well I.D. #: ___

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X02SB~~12~~27
DATE: 3/2/10
GEOLOGIST: EB
DRILLER: Vinney

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Dk Brn	V.F. Fine Sandy Silt with Organics						
	1												
	1.5												
	2												
	2.5					Tan	Moist, V.F. Fine Sandy Clay						
	3		4.0/5			Rust							
	3.5												
	4												
	4.5					Gray/	V. Fine-Med. ~~Sand~~						
	5					White	Clayey Sand						
	5.5		2.0/1				Saturated at 5'						
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2 44 46

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No ____ Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ⊠ DPT or ( ) Hand Auger

BORING No.: X02SB029
DATE: 3/13/10
GEOLOGIST: EB
DRILLER: Virones

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Tan	Moist, VF-Fine Sandy Clay						
	1												
	1.5												
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5					Tan	Moist, VF-Fine Clayey Sand *Saturated at 6						
	6												
T.D.	15												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): ____

Remarks: ____

Converted to Well: Yes ✓ No ____ Well I.D. #: X02TW02

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X02SB031
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					D.Brown	Moist, V.F-Fine Sandy Silt						
	1												
	1.5					Rust/ Brown	Moist, V.F.-Fine Sandy Clay						
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 Hr-6 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: X DPT or ( ) Hand Auger

BORING No.: X02SB032
DATE: 3/13/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					DBrn	Moist, V.F.-Fine Sandy Silt with organics						
	1												
	1.5					Tan	Moist, V.F. Fine sandy clay						
	2												
	2.5												
	3												
	3.5												
	4												
	4.5												
	5												
	5.5					Tan	Moist, V.F.- Fine Clayey Sand						
	6												
	7												
	8												
	9						saturated @ 9.5'						
	10												
T.D.	18												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): [ ]

Remarks: Samples at 2

Converted to Well: Yes X No ___ Well I.D. #: X02TW01

X02TW01

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: XI25B035
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust	Moist, V.F.-Fine						
	1						Sandy Clay						
	1.5												
	2												
	2.5												
	3												
	3.5												
	4												
	4.5		100%			Rust	Moist, V.F.-Fine						
	5						Clayey Sand						
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 4-6' Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

Page ___ of ___

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY:
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X02SB040
DATE: 3/15/10
GEOLOGIST: EB
DRILLER: Vironex

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
	0.5					Rust/ Brown	V.F. Fine Sandy Silt Moist						
	1												
	1.5												
	2												
	2.5					Rust/ Tan	Moist V.F. Fine Sandy Clay						
	3												
	3.5												
	4												
	4.5												
	5												
	5.5												
	6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 24 + 46 Samples

Drilling Area Background (ppm): ____

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X105B001
DATE: 1-26-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0842	0006	0.5				very wet and loose	Brown	F. organics and roots; silt/clay some		wet				
0852	0024	1					Brown	F. organics and roots; silt/clay some		wet				
		1.5												
		2												
0855	0204	2.5				med. stiff	Brown	Silty clay						
		3												
		3.5												
		4												
	0405	4.5				stiff	Brown-Green	Clay some F-M sand						
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Drilling Area Background (ppm): NA

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X105B002
DATE: 1-25-10 and 1-26-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0856	0006	0.5				very wet and loose	Brown	silt/clay and organics (tr. F. sand Fines and roots)		wet				
1-25-10 0908	0024	1					Brown	F. organics and clay tr. F. sand		wet				
		1.5												
—		2												
1-26-10 0945	0204	2.5				med stiff	Brown	Clayey silt tr. F. sand						
		3												
		3.5												
		4												
0956	0405	4.5			X	stiff	Green-Gray	Silty clay tr. F. sand		wet				
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): NA

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X10SB003
DATE: 1-25-10 and 1-26-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0930	0006	0.5				very wet and loose	Brown	F. organics and roots some silt/clay		wet				
1-25-10 0950	0024	1					Brown	Organics some silt and clay		wet				
		1.5												
		2				loose								
1-26-10 1020	0204	2.5				med. to stiff	Brown	F. organics and clay some roots		wet				
		3												
		3.5												
		4												
1030	0405	4.5				stiff	Green Brown	Silty clay tr. F. sand						
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): NA

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Converted to Well: Yes _____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X10SB004
DATE: 1-26-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1429	0006	0.5				very wet and loose	Brown	F. organics and roots some silt/clay		wet				
1445	0024	1												
		1.5					Brown	Clayey silt and F. organics		wet				
		2												
1505	0204	2.5				Med stiff	Brown to Green Gray	Clayey silt tr. F. sand		wet				
		3												
		3.5												
		4												
1515	0405	4.5				Stiff	Green Gray	Clay tr. F. sand						
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Drilling Area Background (ppm): NA

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (x) Hand Auger

BORING No.: X10SB005
DATE: 1-26-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1215	0006	0.5				very wet and loose	Brown	F. organics and roots some silt/clay		wet				
1228	0024	1					Brown	Silt/clay/F. organics some		wet				
		1.5						roots tr. F. sand						
		2												
1235	0204	2.5				mod stiff	Green-Gray	Clay some silt		wet				
		3												
		3.5												
		4												
1245	0405	4.5				very stiff	Green Gray	Clayey silt						
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Drilling Area Background (ppm): NA

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X10SB006
DATE: 1-26-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1100	X006	0.5				very wet and loose	Brown	F. organics and roots somecley		wet				
	0024	1					Brown	Organics some clay						
1110		1.5												
		2												
1118	0204	2.5				med stiff	Brown and Green	Clay some silt tr. sand						
		3												
		3.5												
		4												
1145	0405	4.5				stiff	Green - Gray	Clay some silt						
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): NA

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X105B007
DATE: 1-26-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1545	0006	0.5				very wet and loose	Brown	F. organics and roots some clay		wet				
1555	0024	1					Brown	F, organics and roots some clay		wet				
		1.5												
		2												
1600	0204	2.5				med stiff	Green - Gray	Clay some silt		wet				
		3				to stiff								
		3.5												
		4												
1610	0405	4.5				stiff	Green - Gray	Clay tr. F. sand						
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): NA

Remarks: 2" Hand auger through 3" PVC casing to 5' bgs

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: ——
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X10SB008
DATE: 2-2-10
GEOLOGIST: J. Birkett
DRILLER: ——

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0940	0006	0.5				very wet and loose	Brown	F, organics and roots some clay		wet				
	↑	1				↓								
0935	0024	1.5					Brown	F, organics and roots some clay		wet				
	↓	2				↓								
	↑	2.5				loose	Brown	F, organics and clay some F, sand		wet				
	↑	3				↓		↓						
0950	0204	3.5				↓		↓						
	↓	4				med. stiff								
	↑													
0958	0405	4.5					Green	clayey silt some F, sand		wet				
	↓	5			EOB 5'			↓ ↓						
		5.5												
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Drilling Area Background (ppm): NA

Converted to Well: Yes ____ No X Well I.D. #: ____

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X105B009
DATE: 2-2-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1110	0006	0.5				very wet and loose	Brown	F. organics and roots some clay		wet				
		1												
1025	0024	1.5				loose	Brown	F. organics and clay tr. F. sand		wet				
		2												
		2.5												
1045	0204	3				loose	Brown	F. organics and clay tr. F. sand and roots		wet				
		3.5												
		4				med stiff								
		4.5				very stiff	Green	Clay some F. sand		wet				
1055	0405	5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): NA

Remarks: 2" Hand auger through 3" ID Schedule 40 PVC casing to 5' bgs

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X10SB010
DATE: 1-25-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1540	0006	0.5				very wet and loose	Brown	F. organics and roots some clay		wet				
1510	0024	1					Brown	Silt/clay and roots to. F. Sand		wet				
		1.5						↓ ↓						
	↓	2						↓ ↓						
1530	0204	2.5					Brown	Silty clay tr. F. Sand		wet				
	↓	3												
		3.5												
	↓	4												
		4.5			EOB 4' bgs									
		5												
		5.5												
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2" Hand auger through 3" ID PVC casing to 4' bgs

Drilling Area Background (ppm): NA

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X105B011
DATE: 1-27-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0925	0006	0.5				very wet and loose	Brown	F, organics and roots some clay		wet				
0933	0024	1					Brown	F, organics and roots some clay		wet				
		1.5						↓ ↓						
		2												
0940	0204	2.5				stiff	Light Brown - Green	Clay tr. F. sand						
		3												
		3.5												
		4												
	0405	4.5				very stiff	Green - Gray	Clay tr. F. sand						
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2" Hand auger through 3" PVC casing to 5' bgs

Drilling Area Background (ppm): NA

Converted to Well: Yes _____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X10SB012
DATE: 1-27-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
0830	0006	0.5				very wet and loose	Brown	F. organics and roots some clay		wet				
0840	0024	1					Brown	F. organics and clay		wet				
		1.5												
		2												
0848	0204	2.5				mod stiff	Brown	Clay some F. sand		wet				
		3					Green-Gray							
		3.5												
		4												
0859	0405	4.5				very stiff	Green Gray and Brown	Clay		wet mottled				
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Drilling Area Background (ppm): NA

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X10SB013
DATE: 2-2-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	MATERIAL DESCRIPTION: Color	MATERIAL DESCRIPTION: Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1302	0006	0.5				very wet and loose	Brown	F. organics and roots some clay		wet				
		1						F. organics and roots some clay		wet				
1309	0024	1.5						tr. F. sand						
		2												
		2.5					Brown	F. organics w/ roots and clay		wet				
1317	0204	3						tr. F. sand						
		3.5												
		4												
1335	0405	4.5				stiff	Grem Gray	Clay tr. M. sand		wet, mottled				
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Drilling Area Background (ppm): NA

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X105B014
DATE: 1-27-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1111	0006	0.5				very wet and Loose	Brown	F. organics and roots some clay		wet				
1120	0024	1					Brown and Green	F. organics and roots some clay		wet				
		1.5					Gray							
		2						silty clay						
1131	0204	2.5				med stiff	Brown and Green	Silty clay tr. F. sand and roots		wet				
		3					Gray							
		3.5												
		4												
1143	0405	4.5				stiff	Green Gray	Silty clay tr. F. sand						
		5												
		5.5			EOB 5' bgs									
		6												

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2" Hand auger through 3" ID PVC casing to 5' bgs

Drilling Area Background (ppm): NA

Converted to Well: Yes ____ No X Well I.D. #: —

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: INDIAN HEAD
PROJECT NUMBER: 112G00810
DRILLING COMPANY: —
DRILLING RIG: ( ) DPT or (X) Hand Auger

BORING No.: X105B015
DATE: 2-2-10
GEOLOGIST: J. Birkett
DRILLER: —

Time	Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
1235	0006	0.5				very wet and loose	Brown	F. organics and roots some clay		wet				
		1				↓								
1238	0024	1.5				↓	Brown	F. organics and roots some clay		wet				
		2						↓	↓					
		2.5												
		3												
1240	1284	3.5				med stiff	Light Brown	clay tr. F. sand		wet				
		4												
		4.5				very stiff	Green Gray	clayey silt some F. sand		wet, mottled				
1250	0406	5						↓	↓					
		5.5												
		6						↓	↓					
					EOB 6' bgs									

* When rock coring, enter rock brokeness.

** Include monitor reading - increase reading frequency if elevated reponse read.

Remarks: 2" Hard auger through 3" ID PVC casing to 6' bgs

Drilling Area Background (ppm): NA

Converted to Well: Yes ____ No X Well I.D. #: —

APPENDIX F.2

SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 01

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27405 | PAGE 1 OF 1

PROJECT NO: CTO 112G00810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER. / ANNA MILLKEN
SAMPLERS (SIGNATURE) Ellen Bartlett Tony Rojahn		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8357	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX AB # 8631 2526 7708		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID (AIR BLAST POND (AXO 01))	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES 8 oz JAR	EXPLOSIVES 1L AMBER GLASS	PH, CEC & TOC 8 oz JAR	EXPLOSIVES ZIPLOCK BAGS	COMMENTS
									G	4°C					
									G	4°C					
									G	4°C					
									P	4°C					
3/16	0800	RB-031610-01	QC AQ	-	-	AQ	G	2			-	2			DPT SLEEVE
3/16	0825	X01SB002 0204	SB 002	2	4	SO	G	2			1	-	1		
3/16	0850	X01SB011 0204	SB 011	2	4	SO	G	1			1				
3/16	0900	X01SB019 0204	SB 019	2	4	SO	G	1			1				
3/16	0910	X01SB018 0204	SB 018	2	4	SO	G	1			1				
3/16	0930	X01SB012 0204	SB 012	2	4	SO	G	1			1				
3/16	0940	X01SB003 0204	SB 003	2	4	SO	G	1			1				
3/16	0000	FD031610-01	QC	-	-	SO	G	1			1				FROM X01SB011 0204
3/16	1352 (1505)	X01SS002 0006	SB 002	0	0.5	SO	C	1			-	-	-	1	
3/16	1400	X01SS002 0024	↓	0	2	SO	C	1			-	-	-	1	
3/16	1415	X01SS005 0006	SB 005	0	0.5	SO	C	1			-	-	-	1	
3/16	1420	X01SS005 0024	↓	0	2	SO	C	1			-	-	-	1	
3/16	1430	X01SS011 0006	SB 011	0	0.5	SO	C	1			-	-	-	1	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Rojahn	3-16-10	1900	1. RECEIVED BY FEDERAL EXPRESS	3-16-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27407 | PAGE 1 OF 1

PROJECT NO: 112600810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINKI	PHONE NUMBER: (412) 921-8308	LABORATORY NAME AND CONTACT: ANAIA MILLKEN / ANALYTICAL LAB SER
SAMPLERS (SIGNATURE): Tony Royal		FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8857	ADDRESS: 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER: FED EX AB # 8631 2526 7708		CITY, STATE: MIDDLETOWN PA

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES ZIP LOCK BAGS	PH, CEC, TOC 8oz JAR	COMMENTS
		AIR BLAST POND (UXO 01)							P	4°C			
3/16	1435	X01SS011 0024	SB 011	0	2	SO	C	2	1		1		
3/16	1440	X01SS015 0006	SB 015	0	0.5	SO	C	1	1				
3/16	1445	X01SS015 0024	↓	0	2	SO	C	1	1				RUN MS/MSD
3/16	1450	X01SS019 0006	SB 019	0	0.5	SO	C	2	1		1		
3/16	1455	X01SS019 0024	↓	0	2	SO	C	1	1				RUN MS/MSD
3/16	1500	X01SS020 0006	SB 020	0	0.5	SO	C	1	1				
3/16	1457	X01SS020 0024	↓	0	2	SO	C	1	1				
3/16	1502	X01SS018 0024	SB 018	0	2	SO	C	1	1				
3/16	1505	X01SS018 0006	↓	0	0.5	SO	C	1	1				
3/16	1515	X01SS016 0006	SB 016	0	0.5	SO	C	1	1				
3/16	1519	X01SS016 0024	↓	0	2	SO	C	1	1				
3/16	1520	X01SS017 0006	SB 017	0	0.5	SO	C	1	1				
3/16	1525	X01SS017 0024	↓	0	2	SO	C	1	1				

1. RELINQUISHED BY: Tony Royal	DATE: 03-16-10	TIME: 1900	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 3-16-10	TIME: 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27409 | PAGE 1 OF 1

PROJECT NO: CTO 112400810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX AB # 8631 2526 7708		CITY, STATE MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES Zip Lock Bags	COMMENTS
		AIR BLAST POND (UXO 01)							R	4°C		
3/16	1528	X01550130006	SB 013	0 (TR)	0.5	SO	C	1	1			
3/16	1533	X01550130024	↓	0	2	SO	C	1	1			
3/16	1535	X01550120006	SB 012	0	0.5	SO	C	1	1			
3/16	1540	X01550120024	↓	0	2	SO	C	1	1			
3/16	0000	FD031610-04	QC	-	-	SO	C	1	1			FROM X01550190006
3/16	0000	FD031610-05	QC	-	-	SO	C	1	1			FROM X01550180024

1. RELINQUISHED BY Tony Rojahn	DATE 3-16-10	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 3-16-10	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27416 | PAGE 1 OF 1

PROJECT NO: CTO 112G00810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANNA MILLIKEN / ANALYTICAL LABS SER
SAMPLERS (SIGNATURE) Tony Rojahn		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX AB# 8631 2526 3893		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
		AIR BLAST POND (UXO 01)																
									PRESERVATIVE USED									
									TYPE OF ANALYSIS									
										EXPLOSIVES 4°C	EXPLOSIVES ZIPLOCK BAGS 4°C	EXPLOSIVES 1L AMBER GLASS						
										P	G							
3/17	0910	RB03/710-01	QC	-	-	AQ	G	2	-	2								HAND CORER
3/17	0920	X0155001 0006	SB 001	0	0.5	SO	C	1	1									
3/17	0925	X0155001 0024	↓	0	2	SO	C	1	1									
3/17	0935	X0155003 0006	SB 003	0	0.5	SO	C	1	1									
3/17	0940	X0155003 0024	↓	0	2	SO	C	1	1									
3/17	0945	X0155008 0006	SB 008	0	0.5	SO	C	1	1									
3/17	0950	X0155008 0024	↓	0	2	SO	C	1	1									
3/17	0955	X0155004 0006	SB 004	0	0.5	SO	C	1	1									
3/17	1000	X0155004 0024	↓	0	2	SO	C	1	1									
3/17	1005	X0155006 0006	SB 006	0	0.5	SO	C	1	1									
3/17	1010	X0155006 0024	↓	0	2	SO	C	1	1									
3/17	1020	X0155007 0006	SB 007	0	0.5	SO	C	1	1									
3/17	1025	X0155007 0024	↓	0	2	SO	C	1	1									

1. RELINQUISHED BY Tony Rojahn	DATE 3-18-10	TIME 1830	1. RECEIVED BY FEDERAL EXPRESS	DATE 3-18-10	TIME 1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27417 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810 CTO 423	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Tony Rojahn		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX AB # 8631 2526 3893		MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES ZIP LOCK BAGS	COMMENTS
		AIR BLAST POND (UXO 01)							P	4°C		
3/17	1030	X01SS0090006	SB 009	0	0.5	SO	C	1	1			
3/17	—	X01SS0090024	↓	~~0~~	—	—	—	—	—			NOT COLLECT SATURATED SOIL
3/17	1035	X01SS014 0006	SB 014	0	0.5	SO	C	1	1			
3/17	1040	X01SS014 0024	↓	0	2	SO	C	1	1			
3/17	1045	X01SS010 0006	SB 010	0	0.5	SO	C	1	1			
3/17	1050	X01SS010 0024	↓	0	2	SO	C	1	1			

1. RELINQUISHED BY: Tony Rojahn	DATE: 3-18-10	TIME: 1830	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 3-18-10	TIME: 1930
2. RELINQUISHED BY:	DATE:	TIME:	2. RECEIVED BY:	DATE:	TIME:
3. RELINQUISHED BY:	DATE:	TIME:	3. RECEIVED BY:	DATE:	TIME:

COMMENTS:

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031610-01
Sampled By: T. ROJAHN
C.O.C. Number: 27405

[] Trip Blank
[] Source Water Blank
[x] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-16-10
Time: 0800
Method: POUR THROUGH SLEEVE

WATER SOURCE:

[] Laboratory Prepared
[x] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENV.
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: Soil
Equipment Used: DPT SAMPLE SLEEVE
Equipment Type:
[x] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES / (NO)
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Taylor

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031710-01
Sampled By: T. ROJAHN
C.O.C. Number: 27416

[] Trip Blank
[] Source Water Blank
[] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-17-10
Time: 0910
Method: POUR DI OVER HAND CORE

WATER SOURCE:

[] Laboratory Prepared
[■] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENV.
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: SOIL
Equipment Used: HAND CORE
Equipment Type:
[] Dedicated
[■] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES / (NO)
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Terry Rojahn

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XO1SB002020204
Sample Location: XO1SB002
Sampled By: EB
C.O.C. No.: 27405

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 3/16/10	2-4'	Tan/Gray	Tan, Mst, V.F Fine Sandy Clay (2-3')
Time: 0825			Tan/Gray, Mst, Hard clay (3-4')
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes ✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

pH, CEC, TOC

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD — Duplicate ID No.: _____

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X01SB011024
Sample Location: X01SB011
Sampled By: EB
C.O.C. No.: 27405

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0850	2-4'	Tan	Tan, Moist V.F.-Fine clayey sand (2-3')
Method: DPT			Tan, Moist V.F. Fine sandy Clay (3-4')
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

* Duplicate

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD

Duplicate ID No.: FD031610-01

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO1SB01902O4
Sample Location: XO1SB012
Sampled By: EB
C.O.C. No.: 27405

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0900	24'	Tan/Rust Gray	Moist, V.F. Fine Clayey Sand
Method: DPT			Moist, V.F. Fine Sandy Clay
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MS/MSD

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X01SB01B0204
Sample Location: X01SB01B
Sampled By: EB
C.O.C. No.: 27405

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0910	24'	Tan/Rust	Moist, V.F.-Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XO1SB012020Y
Sample Location: XO1SB012
Sampled By: EB
C.O.C. No.: 27405

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0930	2-4'	Tan/Rust	Moist, VF-Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XA1SB003-0204
Sample Location: XA1SB003
Sampled By: EB
C.O.C. No.: 27405

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0940	2-4'	Tan/Gray	Mst, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (1) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XO1SS002D006
Sample Location: XO1SBG02
Sampled By: TR
C.O.C. No.: 27405

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1355	0-6"	brn	Silt w/ trace Sand & organics
Method: Hand Core				Moist
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

for TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS002D0024
Sample Location: X01SB002
Sampled By: SBL
C.O.C. No.: 27405

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:			
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1400	0-24"	brn/dk brn	Clayey silt w/ trace sand & organics, Moist
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	ND	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X01SS005UU6
Sample Location: X01SC005
Sampled By: TR
C.O.C. No.: 27405

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1415	0-6"	Dark brn/light brn	Sandy Silt w/ gravel & organics.
Method: Handcore				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

For TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS005G024
Sample Location: X01SB005
Sampled By: SBC
C.O.C. No.: 27405

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1420	0-24"	brn/dark brn	Silt w/ trace Sand. Moist.
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	ND	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)
Project No.: 112G00810, CTO 423

Sample ID No.: XO1SS01 0006
Sample Location: XO1SB011
Sampled By: TR
C.O.C. No.: 27805

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1430	0-6"	brn	Sandy Silt w/ Organics.
Method: Hand Core				Slightly Moist
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

for TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS011024
Sample Location: X01SB011
Sampled By: SBC
C.O.C. No.: 27407

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1435	0-24"	light brn	clayey silt w/ some sand & trace organics, Moist
Method:				
Hand Core				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS0S0006
Sample Location: X01SB015
Sampled By: TR
C.O.C. No.: 27407

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1440	0-6"	light brn	Sandy Silt w/ trace organics. Slightly moist.
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO1SS01S0024
Sample Location: XO1SB01S
Sampled By: SBL
C.O.C. No.: 27407

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1445	0-24"	light brn	Clayey silt w/ trace sand, slightly moist.
Method: HandCore				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD: Yes

Duplicate ID No.: No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XO1SS019QA
Sample Location: XO1SR019
Sampled By: TR
C.O.C. No.: 27407

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-16	1450	0-6"	light brn	Sandy Silt with Organics. Moist
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	FD031610-04

Signature(s):

For TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XO1SS01C024
Sample Location: XO1SB019
Sampled By: S&C
C.O.C. No.: 27407

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1455	0-24"	Light brn	Clayey silt w/ Sand and trace
Method:				Organics. Moist.
Hand Core				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD Yes

Duplicate ID No.: No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO1SS02D00006
Sample Location: XO1SB02D
Sampled By: TR
C.O.C. No.: 27407

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:			
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1500	0-6"	Dark Brown	Silt w/ trace sand & organics. Slightly moist.
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

for TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X01SS02WW24
Sample Location: X01SB02
Sampled By: SBC
C.O.C. No.: 27407

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:			
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 3-16-10	1457	0-24"	dark brn/light brn	Clayey silt w/ trace sand and organics. Moist
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X01SSC18G024
Sample Location: X01SBG18
Sampled By: SBC
C.O.C. No.: 27407

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1502	0-24"	lightbrn	Silty/ trace Sand. Slightly Moist
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	~~Yes~~ No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	~~Yes~~ FD031610-05

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XO1SS018XXXX
Sample Location: XO1SB018
Sampled By: TR
C.O.C. No.: 27407

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1505	0-6"	light brn/dark brn	Silty sand with organics and trace gravel. Moist
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	NO	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

for TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO1SS01600006
Sample Location: XO1SB016
Sampled By: TR
C.O.C. No.: 27407

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1515	0-6"	light brn/dark brn	Blk/gry silt w/ trace sand & organics, moist.
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	ND	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

for TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X01SS01600324
Sample Location: X01SB016
Sampled By: SBC
C.O.C. No.: 27407

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1519	0-24"	brn	Sandy Silt w/ clay & trace organics. Moist
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XO1SS017 0006
Sample Location: XO1SB017
Sampled By: TR
C.O.C. No.: 27407

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1520	0-6"	Dark brown/brn	Sandy Silt w/ organics, Slightly moist.
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS01700Z4
Sample Location: X01SB017
Sampled By: SBC
C.O.C. No.: 27407

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1525	0-24"	light brn/dark brn	Clayey Silt w/ Trace Sand & Organics. Moist
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	N.	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS013006
Sample Location: X01SB013
Sampled By: TR
C.O.C. No.: 27409

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1528	0-6"	dark brn/light brn	Sandy Silt w/ organics. Moist
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (X)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

for TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X01SS01B00024
Sample Location: X01SB013
Sampled By: SBL
C.O.C. No.: 27409

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1533	0-24"	light brn	Sandy silt w/ trace organics
Method:				Moist.
Hand Core				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS02-0006
Sample Location: X01SB013
Sampled By: TR
C.O.C. No.: 27409

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1535	0-6"	lightbrown/darkbrown	Sand, Silt w/ Clay and trace
Method:				Organics, Moist
Hand Core				
Monitor Readings				
(Range in ppm):				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

for TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO1SS01200324
Sample Location: XO1SB012
Sampled By: SBC
C.O.C. No.: 27409

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1540	0-24"	light brn	Clayey silt w/ trace sand &
Method: Hand Core				organics, Moist
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS001 0006
Sample Location: X01SB001
Sampled By: TR
C.O.C. No.: 27916

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3-17-10 3/18/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HA (TR) HAND CORE	0920	0-6"	TAN/Gray	Moist, Tan/Gray V.F. Sandy Clay
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (X)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tony Rook

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS001002H
Sample Location: X01SB001
Sampled By: SC
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

Composite

GRAB SAMPLE DATA: COMPOSITE

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0935	0-24"	Tan	Wet, clayey, V.F.-Fine Sand
Method: HA			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3-17-10	Time ↑	Depth ↑	Color ↑	Description (Sand, Silt, Clay, Moisture, etc.) ↑
Method: HAND CORE				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tony Royal for SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)
Project No.: 112G00810, CTO 423

Sample ID No.: XO1SS003006
Sample Location: XO1SS003
Sampled By: TQ
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-18-10	0935	0-6"	brn	Clayey Silt w/ trace Sand & Gravel organics. Moist.
Method: Hand Auger				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XO1SS001SO2A
Sample Location: XO1SB001
Sampled By: SC
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/14/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HA (TT) HAND CORE	0940	0-24"	Tan/Gray	Moist, V.F-Fine Sandy Clay
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (X)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tony Lopez for SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS004D0062
Sample Location: X01SB004
Sampled By: TR
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/18/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: ~~HA~~ (TR) Hand Core	0945	0-6"	Tan	Moist, V.F.-Fine Sandy Clay
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (1)✓	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Terry Rogers

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X0155008C024
Sample Location: X0155008
Sampled By: SGL
C.O.C. No.: 27416

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-17-10	0950	0-24"		Clayey silt w/ sand & trace
Method:				organics. Moist to wet.
Hand Core				
Monitor Readings				
(Range in ppm):				
~				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XA1SS004006
Sample Location: XA1SB004
Sampled By: TR
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/18/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: ~~HA~~ TR HAND Core	0955	0-6"	Tan/Black	Moist, Clayey Silt
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ty Hyde

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS0040024
Sample Location: X01SB004
Sampled By: SC
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/19/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: ~~HA~~ TK Hand Core	1000	0-24"	Tan/Black	Moist, clayey Silt w/pebbles
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle If Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Terry Spak FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS006D006
Sample Location: X01SB006
Sampled By: TR
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE TR	1005	0-6"	Black	Moist, Clayey; V.F. Fine Sand
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Tony Cozad

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XA1SS006-0024
Sample Location: XA1SB006
Sampled By: SC
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: ~~HAND~~ AUGER HAND CORE	1010	0-24"	Brown	Mdst, M.F. Fine Sandy Clay
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag ✓	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tony Gail FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS0170006
Sample Location: X01SS007
Sampled By: TR
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-17-10	1020	0-6"	brn/dark brn	Sand Course W/ Trace
Method:				organics. Wet
Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tony Lloyd

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01550760024
Sample Location: X01SB007
Sampled By: SC
C.O.C. No.: 27416

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1025	0-24"	Brown/Tan	Wet, U.F.-Coarse Sand (Fill Material)
Method: HAND AUGER				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Terry Royal FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS0090006
Sample Location: X01SB005
Sampled By: TR
C.O.C. No.: 27417

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-17-10	1030	0-6"	Dark Brn	Silty coarse Sand w/ trace organics,
Method: Hand Core				WET
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XA1SS01400006
Sample Location: XA1SB014
Sampled By: TR
C.O.C. No.: 27417

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/16/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA (TR)	1035	0-6"	Tan	Moist, V.F.-Medium Silty Sand with pebbles.
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tim Lark

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: X01SS01460024
Sample Location: X01SB014
Sampled By: SBC
C.O.C. No.: 27417

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-17-10	1040	0-24"	light brn	Silty coarse sand. Wet
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	ND	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	ND

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)

Project No.: 112G00810, CTO 423

Sample ID No.: XO1SS0100006
Sample Location: XOSS01
Sampled By: TR
C.O.C. No.: 27417

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA: Composite (TR)

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1045	0-6"	D. Brown	Moist, V.F.-Fine Clayey Silt with organics
Method: Hand Core			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	✓ Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tony Rospoli

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Air Blast Pond (UXO 01)
Project No.: 112G00810, CTO 423

Sample ID No.: X01550100024
Sample Location: X01SB010
Sampled By: SC
C.O.C. No.: 27417

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

~~GRAB SAMPLE DATA:~~ Composite Sample

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1050	0-24"	Tan/Rust	Moist, VF clayey silt
Method: Hand Core			
Monitor Reading (ppm):			

Composite

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.1

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Taylor for SC

APPENDIX F.3

SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 02

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27375 | PAGE 1 OF 1

PROJECT NO: 112G00810	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857
		CARRIER/WAYBILL NUMBER FED EX AB# 8631 2526 3974	

LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER. / ANNA MILLER
ADDRESS: 34 DOGWOOD LANE
CITY, STATE: MIDDLETOWN, PA 17057

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									PRESERVATIVE USED									TYPE OF ANALYSIS									COMMENTS
									P	G	G							4°C	4°C	4°C							Explosives/Metals Zip Lock Bags	Explosives 8oz Jar	Metals 4oz Jar						
2/03	1000	X02SD001	SD 001	0	0.5	SD	G	2	-	1	1																								
2/03	1005	X02SD002	SD 002	0	0.5	SD	G	2	-	1	1																								
2/03	1010	X02SD003	SD 003	0	0.5	SD	G	2	-	1	1																								
2/03	1022	X02SS004 0006	SB 004	0	0.5	SO	C	1	1																										
2/03	1030	X02SS004 0024	↓	0	2	SO	C	1	1																										
2/03	1035	X02SS007 0006	SB 007	0	0.5	SO	C	1	1																										
2/03	1040	X02SS007 0024	↓	0	2	SO	C	1	1																										
2/03	1048	X02SS008 0006	SB 008	0	0.5	SO	C	1	1																										
2/03	1053	X02SS008 0024	↓	0	2	SO	C	1	1																										
2/03	1108	X02SS001 0006	SB 001	0	0.5	SO	C	1	1																										
2/03	1112	X02SS001 0024	↓	0	2	SO	C	1	1																										
2/03	1121	X02SS002 0006	SB 002	0	0.5	SO	C	1	1																										
2/03	1126	X02SS002 0024	↓	0	2	SO	C	1	1																										

1. RELINQUISHED BY Tony Rojahn	DATE 2-4-10	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 2-04-10	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27376 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB # 8631 2526 3974		MIDDLETOWN, PA 17057

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)								COMMENTS
									P	G	G						
									PRESERVATIVE USED								
									4°C	4°C	4°C						
									TYPE OF ANALYSIS								
									EXPLOSIVES / METALS ZIP LOCK BAGS	EXPLOSIVES 8 OZ JAR	METALS 4 OZ JAR						
2/03	1135	X02SS00300006	SB 003	0	0.5	SO	C	1	1								DO MS/MSD
2/03	1139	X02SS003 0024	↓	0	2	SO	C	1	1								
2/03	1153 (1156)	X02SS006 0006	SB 006	0	0.5	SO	C	1	1								
2/03	1156	X02SS00600024	↓	0	2	SO	C	1	1								
2/03	1355	X02SD004	SD 004	0	0.5	SD	G	2	-	1	1						
2/03	1410	X02SD006	SD 006	0	0.5	SD	G	2	-	1	1						
2/03	1425	X02SD005	SD 005	0	0.5	SD	G	2	-	1	1						
2/03	1445	X02SD007	SD 007	0	0.5	SD	G	2	-	1	1						
2/03	0000	FD020310-01	QC	0	0.5	SD	G	2	-	1	1						
2/04	0000	FD020410-01	QC	0	0.5	SO	C	1	1	—	—						
↓	0935	X02SS00500006	SB 005	0	0.5	SO	C	1	1	—	—						
↓	0937	X02SS00500024	SB 005	0	2	SO	C	1	1	—	—						
2/04	0949	X02SS00900006	SB 009	0	0.5	SO	C	1	1	—	—						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	2-4-10	1900	1. RECEIVED BY FEDERAL EXPRESS	2-09-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27377 | PAGE 1 OF 1

PROJECT NO: 112G00810	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SEK / ANNA MILLIKEN
SAMPLERS (SIGNATURE) Ford Ballou, Tony Rojahn		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED. EX. AB# 8631 2526 3974		CITY, STATE MIDDLETOWN, PA 17057

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G): G	PRESERVATIVE USED: 4°C	TYPE OF ANALYSIS: EXPLOSIVES/METALS Zip Lock Bags	COMMENTS
2/04	0952	X02SS0090024	SB 009	0	2	SO	C	1	1			
|	0959	X02SS0100006	SB 010	0	0.5	|	|	1	1			RUN MS/MSD
|	1002	X02SS0100024	↓	0	2	|	|	1	1			
|	1011	X02SS0150006	SB 015	0	0.5	|	|	1	1			
|	1014	X02SS0150024	↓	0	2	|	|	1	1			
|	1022	X02SS0140006	SB 014	0	0.5	|	|	1	1			
|	1026	X02SS0140024	↓	0	2	|	|	1	1			
|	1035	X02SS0130006	SB 013	0	0.5	|	|	1	1			
|	1039	X02SS0130024	↓	0	2	|	|	1	1			
|	1049	X02SS0120006	SB 012	0	0.5	|	|	1	1			
|	1053	X02SS0120024	↓	0	2	|	|	1	1			
↓	1103	X02SS0110024	SB 011	0	2	↓	↓	1	1			
2/04	1106	X02SS0110006	↓	0	0.5	SO	C	1	1			

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Rojahn	2-4-10	1900	1. RECEIVED BY FEDERAL EXPRESS	2-04-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27378 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL SER. / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS LAB
		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB # 8631 2526 3974		MIDDLETOWN, PA 17057

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES/METALS ZIP LOCK BAGS	COMMENTS
									R	4°C		
2/04	1115	X02SS01600006	SB016	0	0.5	SO	C	1	1			
	1119	X02SS01600024	↓	0	2			1	1			RUN MS/MSD
	1124	X02SS01700006	SB017	0	0.5			1	1			
	1128	X02SS01700024	↓	0	2			1	1			RUN MS/MSD
	1140	X02SS01800006	SB018	0	0.5			1	1			
	1141	X02SS01800024	↓	0	2			1	1			
	1149	X02SS01900006	SB019	0	0.5			1	1			
	1152	X02SS01900024	↓	0	2			1	1			
	1159	X02SS02000024	SB020	0	2			1	1			
	1201	X02SS02000006	↓	0	0.5			1	1			
	1256	X02SS02100024	SB021	0	2			1	1			
	1300	X02SS02100006	↓	0	0.5	↓	↓	1	1			
2/04	1307	X02SS02200006	SB022	0	0.5	SO	C	1	1			

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	2-4-10	1900	1. RECEIVED BY FEDERAL EXPRESS	2-04-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27379 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112600810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
Tony Rojahn		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		**CITY, STATE**
		FED. EX. AB # 8631 2526 3974		MIDDLETOWN, PA 17057

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
									G	G								
									PRESERVATIVE USED									
									4°C	4°C								
									TYPE OF ANALYSIS									
									EXPLOSIVES / METALS									
									ZIP LOCK BAGS									
									PH, CEC & TOC									
									8021									
2/04	1309	X02SS022 0024	SB 022	0	2'	SO	C	1	1									
	1318	X02SS023 0006	SB 023	0	0.5'			1	1									
	1320	X02SS023 0024	↓	0	2'			1	1									
	1330	X02SS024 0006	SB 024	0	0.5'			1	1									
	1332	X02SS024 0024	↓	0	2'			1	1									
	1347	X02SS025 0006	SB 025	0	0.5'			1	1									
	1350	X02SS025 0024	↓	0	~~0~~ 2'			1	1									
	1357	X02SS031 0006	SB 031	0	0.5'			1	1									
	1400	X02SS031 0024	↓	0	2'			1	1									
	1408	X02SS039 0006	SB 039	0	0.5			1	1									
	1410	X02SS039 0024	↓	0	2'			2	1	1								
↓	1418	X02SS040 0006	SB 040	0	0.5	↓	↓	1	1									
2/04	1420	X02SS040 0024	↓	0	2'	SO	C	1	1									

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Rojahn	2-4-10	1400	1. RECEIVED BY FEDERAL EXPRESS	2-04-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27380 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112600810	NSF INDIAN HEAD	R. BASINSKI	412-921-8908	ANALYTICAL LABS INC. MILLERS
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
		T. ROJAHN	412-921-8897	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		**CITY, STATE**
		FEDEX # 8631 2526 3174		MIDDLETOWN, PA 17057

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES/NITRATES ZIPLOCK BAG	4°C							COMMENTS
3/04	1430	XO2SS03800006	SB038	0	0.5	SO	C	1	1		1								
3/04	1435	XO2SS03800024	↓	0	2	SO	C	1	1		1								
3/04	0000	FD020410-02	—	—	—	SO	C	1	1		1								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	2-4-10	1400	1. RECEIVED BY FEDEX	2-04-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27383 | PAGE 1 OF 1

PROJECT NO: CTO 112G00810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412) 921-8308
LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLKEN			
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8857
ADDRESS: 34 DOGWOOD LANE			
CARRIER/WAYBILL NUMBER: FED. EX AB # 8631 2526 7720		CITY, STATE: MIDDLETOWN, PA	

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	TYPE OF ANALYSIS: EXPLOSIVES/METALS ZIP LOCK BAGS	EXPLOSIVES 1L GLASS AMBER 4°C	METALS 250ml HDPE 4°C/HNO3						COMMENTS
		AREA 8 (UXO 02)							PRESERVATIVE USED									
										P	G	P						
3/10	1245	RB031010-02	QC	—	—	AQ	G	3	—	2	1							
3/10	1258	X02SS037 0024	SB 037	0	2	SO	C	1	1									
3/10	1255	X02SS037 0006	SB 037	0	0.5	SO	C	1	1									
3/10	1315	X02SS036 0006	SB 036	0	0.5	SO	C	1	1									
3/10	1318	X02SS036 0024	↓	0	2	SO	C	1	1									
3/10	1327	X02SS035 0006	SB 035	0	0.5	SO	C	1	1									
3/10	1330	X02SS035 0024	SB 035	0	2	SO	C	1	1									
3/10	1345	X02SS034 0006	SB 034	0	0.5	SO	C	1	1									
3/10	1347	X02SS034 0024	↓	0	2	SO	C	1	1									
3/10	1355	X02SS033 0006	SB 033	0	0.5	SO	C	1	1									
3/10	1358	X02SS033 0024	↓	0	2	SO	C	1	1									
3/10	1412	X02SS032 0006	SB 032	0	0.5	SO	C	1	1									
3/10	1414	X02SS032 0024	↓	0	2	SO	C	1	1									

1. RELINQUISHED BY: Terry Rojahn	DATE: 3/10/10	TIME: 1830	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 3/10/10	TIME: 1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27384 | PAGE 1 OF 1

PROJECT NO: 112G00310 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX, AB# 8631 2526 7720		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES / METALS ZIP LOCK BAGS	COMMENTS
		AREA 8 (UXO 02)							G	4°C		
3/10	1422	X02SS026 0006	SB 026	0	0.5	SO	C	1	1			
3/10	1425	X02SS026 0024	↓	0	2	SO	C	1	1			
3/10	1435	X02SS027 0006	SB 027	0	0.5	SO	C	1	1			
3/10	1438	X02SS027 0024	↓	0	2	SO	C	1	1			
3/10	1447	X02SS028 0006	SB 028	0	0.5	SO	C	1	1			
3/10	1450	X02SS028 0024	↓	0	2	SO	C	1	1			
3/10	1458	X02SS029 0006	SB 029	0	0.5	SO	C	1	1			
3/10	1500	X02SS029 0024	↓	0	2	SO	C	1	1			
3/10	1505	X02SS030 0006	SB 030	0	0.5	SO	C	1	1			RUN MS/MSD
3/10	1508	X02SS030 0024	↓	0	2	SO	C	1	1			
3/10	0000	FD031010-02	QC	-	-	SO	C	1	1			FROM X02SS033 0006
3/10	0000	FD031010-03	QC	-	-	SO	C	1	1			X02SS026 0006

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Ty Rojahn	3/10/10	1830	1. RECEIVED BY FEDERAL EXPRESS	3/10/10	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27390 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810 CTO: 423	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Ellen Berblitz		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB# 8631 2526 7719		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)		G	G	G	P					COMMENTS
		AREA 8 (UXO 02)							PRESERVATIVE USED		4°C	4°C	4°C	4°C/HNO3					
									TYPE OF ANALYSIS		EXPLOSIVES 802 JAR	METALS 402 JAR	EXPLOSIVES 1L AMBER GLASS	METALS 500-250ml HDPE					
3/12	0800	RB031210-01	QC	-	-	AQ	G	3	—	—	2	1							
3/12	0805	X02SB0090204	SB 009	2	4	SO	G	2	1	1									
3/12	0810	X02SB0090406	↓	4	6	SO	G	2	1	1									
3/12	0810	X02SB0050204	SB 005	2	4	SO	G	2	1	1									
3/12	0815	X02SB0050406	↓	4	6	SO	G	2	1	1									
3/12	0830	X02SB0100204	SB 010	2	4	SO	G	2	1	1									FELIN MS/MSD
3/12	0840	X02SB0100406	↓	4	6	SO	G	2	1	1									
3/12	0850	X02SB0060204	SB 006	2	4	SO	G	2	1	1									
3/12	0855	X02SB0060406	↓	4	6	SO	G	2	1	1									
3/12	0915	X02SB0030204	SB 003	2	4	SO	G	2	1	1									
3/12	0920	X02SB0030406	↓	4	6	SO	G	2	1	1									
3/12	0930	X02SB0020204	SB 002	2	4	SO	G	2	1	1									
3/12	0935	X02SB0020406	↓	4	6	SO	G	2	1	1									

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Rojahn	3-15-10	1900	1. RECEIVED BY FEDERAL EXPRESS	3-15-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27391 | PAGE 1 OF 1

PROJECT NO: CTO: 112600810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308
SAMPLERS (SIGNATURE) Ellen Berblite		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857
		CARRIER/WAYBILL NUMBER FED EX AB # 8631 2526 7719	

LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLKEN
ADDRESS: 34 DOGWOOD LANE
CITY, STATE: MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

AREA 8 (UXO 02)

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)		PRESERVATIVE USED		TYPE OF ANALYSIS: EXPLOSIVES 8 OZ JAR	TYPE OF ANALYSIS: METALS 4 OZ JAR	COMMENTS
									G	G	4°C	4°C			
3/12	1115	X02SB001 0204	SB 001	2	4	SO	G	2	1	1					
3/12	1125	X02SB001 0406	↓	4	6	SO	G	2	1	1					
3/12	1350	X02SB007 0204	SB 007	2	4	SO	G	2	1	1					
3/12	1355	X02SB007 0406	SB ↓	4	6	SO	G	2	1	1					
3/12	1405	X02SB008 0204	SB 008	2	4	SO	G	2	1	1					
3/12	1410	X02SB008 0406	↓	4	6	SO	G	2	1	1					
3/12	1420	X02SB012 0204	SB 012	2	4	SO	G	2	1	1					
3/12	1425	X02SB012 0406	↓	4	6	SO	G	2	1	1					
3/12	1445	X02SB026 0204	SB 026	2	4	SO	G	2	1	1					
3/12	1450	X02SB026 0406	↓	4	6	SO	G	2	1	1					
3/12	1510	X02SB027 0204	SB 027	2	4	SO	G	2	1	1					
3/12	1515	X02SB027 0406	↓	4	6	SO	G	2	1	1					
3/12	1530	X02SB016 0204	SB 016	2	4	SO	G	2	1	1					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Rojahn	3-15-10	1900	1. RECEIVED BY FEDERAL EXPRESS	3-15-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27392 | PAGE 1 OF 1

PROJECT NO: 112600810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412) 921-8309
LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER. / ANNA MILLKEN			
SAMPLERS (SIGNATURE): Ellen Berkstresser	FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8857	ADDRESS: 34 DOGWOOD LANE
CARRIER/WAYBILL NUMBER: FED. EX AIR BILL 8631 2526 7719			CITY, STATE: MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)		PRESERVATIVE USED		TYPE OF ANALYSIS: EXPLOSIVES 8 oz JAR	TYPE OF ANALYSIS: METALS 4 oz JAR	COMMENTS
		AREA 8 (UXO 02)							G	G	4°C	4°C			
3/12	1535	X02SB016 0406	SB 016	4	6	SO	G	2	1	1					
3/12	1555	X02SB018 0204	SB 018	2	4	SO	G	2	1	1					
3/12	1600	X02SB018 0406	↓	4	6	SO	G	2	1	1					
3/13	0820	X02SB032 0204	SB 032	2	4	SO	G	2	1	1					
3/13	0825	X02SB032 0406	↓	4	6	SO	G	2	1	1					
3/13	0000	FD031310-01	QC	—	—	SO	G	2	1	1					FROM X02SB032 0204
3/15	1420	X02SB024 0204	SB 024	2	4	SO	G	2							
3/15	1425	X02SB024 0406	↓	4	6	SO	G								
3/15	1445	X02SB014 0204	SB 014	2	4	SO	G								
3/15	1450	X02SB014 0406	↓	4	6	SO	G								
3/15	1530	X02SB031 0204	SB 031	2	4	SO	G								
3/15	1535	X02SB031 0406	↓	4	6	SO	G								RUN MS/MSD
3/15	1550	X02SB004 0204	SB 004	2	4	SO	G								

1. RELINQUISHED BY: Tony Rojahn	DATE: 3-15-10	TIME: 1900	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 3-15-10	TIME: 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27404 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER (412) 921-8308	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLIKEN
SAMPLERS (SIGNATURE) Ellen Berdette		FIELD OPERATIONS LEADER (412) 921-8857	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX AB # 8631 2526 7719		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									PRESERVATIVE USED									TYPE OF ANALYSIS									COMMENTS
		AREA 8 (UXO 02)							G	G	G							4°C	4°C	4°C						EXPLOSIVES 8oz JAR	METALS 4oz JAR	PH, CEC & TOC 8oz JAR						
3/15	1555	XO2SB00400406	SB004	4	6	SO	G	2	1	1																1	1								
3/15	1610	XO2SB0350204	SB035	2	4	SO	G	3	1	1	1															1	1	1							
3/15	1615	XO2SB0350406	↓	4	6	SO	G	3	1	1	1															1	1	1							
3/15	0000	FD031510-03	QC	—	-	SO	G	2	1	1																1	1								FROM XO2SB0310204

1. RELINQUISHED BY Terry Royal	DATE 3-15-10	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 3-15-10	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27400 | PAGE 1 OF 1

PROJECT NO: CTO: 112G00810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLER
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8857	ADDRESS: 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER: FED EX AB # 863125267719		CITY, STATE: MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

AREA 8 (WXO 02)

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)								COMMENTS
									G	P	P						
									PRESERVATIVE USED								
									TYPE OF ANALYSIS:	4°C	4°C / HNO3	4°C / HNO3					
										Explosives	IL Amber Glass	Total Metals 250ml HDPE	Dis. Metals 500-250 ml HDPE					
3/14	1605	X02GW001	GW 001	—	—	GW	G	9	6	3	3						25MW01 RUN MS/MSD
3/14	0900	FD031410-03	QC	-	-	GW	G	4	2	1	1						From 25MW01
3/15	1035	X02GW003	GW 003	-	-	GW	G	3	2	1							25MW03
3/15	1330	X02GW002	GW 002	—	-	GW	G	3	2	1							25MW02
3/15	1555	X02GW004	TW 01	—	—	GW	G	3	2	1							LOCATION = X02TW001 # SB032 (TE)

1. RELINQUISHED BY: Terry Rojahn	DATE: 3-15-10	TIME: 1900	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 3-15-10	TIME: 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: ALSO; X02TW1004 ON LABEL FOR SAMPLE ID = X02GW1004 & CORRECT LOCATION ID IS X02TW1001

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27414 | PAGE 1 OF 1

PROJECT NO: CTO 423 / 112G00810	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412) 921-8308	LABORATORY NAME AND CONTACT: ANNA MILLIKEN / ANALYTICAL LAB SERV
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: T. RUAHN	PHONE NUMBER: (412) 921-8857	ADDRESS: 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER: FED EX AIR # 963125267708		CITY, STATE: MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G | P | P
PRESERVATIVE USED: 4°C | 4°C/HNO3 | 4°C/HNO3

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES	TOTAL METALS 1L AMBER GLASS	TOTAL METALS 500ml HDPE	DISSOLVED METALS 500ml HDPE	COMMENTS
3/16	1000	X02GW005	GW	—	—	GW	G	4	2	1	1		X02TW02 ~~25~~ TR ESB029
3/16	1225	X02GW006	GW	—	—	GW	G	4	2	1	1		X02TW03 ESB012

AREA 8 (4X0 02)

1. RELINQUISHED BY: Tony Ruahn	DATE: 3/16/10	TIME: 1900 ~~1834~~ TR	1. RECEIVED BY: FEDERAL EXPRESS / DATE: 3/16/10 / TIME: 1900 ~~1834~~ TR
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY / DATE / TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY / DATE / TIME
COMMENTS			

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031010-02
Sampled By: T. ROJAHN
C.O.C. Number: 27383

[] Trip Blank
[] Source Water Blank
[X] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-10-10
Time: 1245
Method: POUR OVER HAND CORE

WATER SOURCE:

[] Laboratory Prepared
[X] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENV
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: SOIL
Equipment Used: HAND CORE
Equipment Type:
[] Dedicated
[X] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) / NO
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Ted Rojahn

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031210-01
Sampled By: T. ROJAHN
C.O.C. Number: 27390

[] Trip Blank
[] Source Water Blank
[x] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-12-10
Time: 0800
Method: Pour through SLEEVE

WATER SOURCE:

[] Laboratory Prepared
[x] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NEXL DI H2O
Supplier: FIELD ENV
Manufacturer: NEXL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: Soil
Equipment Used: DPT SAMPLE SLEEVE
Equipment Type:
[x] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) / NO
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Terry Rojahn

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[*] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X025D001
Sample Location: X025D001
Sampled By: T. Rajahn
C.O.C. No.: 27375

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 2-3-10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1000	0-6"	Brown	clay/F. organics some F sand very wet
Method: Stainless Steel Spoon			
Monitor Reading (ppm): NA			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	yes	
Metals	(1) 4oz Jar	yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SD002
Sample Location: X02SD002
Sampled By: T. Rajah
C.O.C. No.: 27375

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 2-3-10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1005	0-6"	Dark Brown	F. organics ~~and~~ (roots, leafs, sticks) ~~and~~ with Clay tr. F sand Very wet
Method: Stainless Steel Spoon			
Monitor Reading (ppm): NA			

COMPOSITE SAMPLE DATA:

Date: ~~2-3-10~~	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SD003
Sample Location: X02SD003
Sampled By: T. Rajahn
C.O.C. No.: 27375

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 2-3-10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1010	0-6	Dark brown	F. organics (leaves, roots) some clay tr. silt very wet
Method: Stainless Steel Spoon			
Monitor Reading (ppm): NA			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	yes	
Metals	(1) 4oz Jar	yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-020310-01

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: ~~8~~02SD004
Sample Location: X02SD004
Sampled By: FRANSEN
C.O.C. No.: 27376

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 2-3-10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1355	0-6"	MED BROWN	SILT + f g SAND ~~TR~~ CLAY PLANT MATL.
Method: PONAR DREDGE			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	YES	
Metals	(1) 4oz Jar	YES	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

WATER DEPTH ~20' (>15')

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Brett Ramer

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO23D006
Sample Location: XO23D006
Sampled By: PURBAUGH
C.O.C. No.: 27376

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 2-3-10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1410	0-6'	MED BROWN	SILT + CLAY TR f-g SAND
Method: PONAR			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	YES	
Metals	(1) 4oz Jar	YES	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

~20' DEPTH OF WATER

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Fred Mauser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SD005
Sample Location: X02SD005
Sampled By: PW Ramsay
C.O.C. No.: 27376

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 2/3/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1425	0-6"	MED BRN	SILT + CLAY PLANT MATL.
Method: PONAR DREDGE			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

WATER DEPTH ~ 14'

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Fred W Ramsay

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SD007
Sample Location: X02SD007
Sampled By: FRED W CRAWFORD
C.O.C. No.: 27376

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 2/3/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1445			
Method: PONAR DREDGE	0-6"	BRN	SILT + CLAY
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	YES	
Metals	(1) 4oz Jar	YES	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

WATER DEPTH ~ 14'

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Fred W Crawford

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X025S0040006
Sample Location: X025B004
Sampled By: J. Birkett
C.O.C. No.: 27375

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1022	0-6"	Brown	F sand and clay some F organics tr.
Method: Hard core				C sand wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X025S004O024
Sample Location: X025B004
Sampled By: T. Rojahn
C.O.C. No.: 27375

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1030	0-24"	Brown	clay/silt/F. organics some F-sand
Method: Hand core				very wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jrad Bickett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X0255007 0006
Sample Location: X025B007
Sampled By: J. Birkett
C.O.C. No.: 27375

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1035	0-6"	Brown and light brown	organic rich soil and Fsand some clay wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02550070024
Sample Location: X025B007
Sampled By: T. Rojahn
C.O.C. No.: 27375

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1040	0-24"	Brown to tan	clay some F-M sand tr. pebbles wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X025S0080006
Sample Location: X025B008
Sampled By: J. Birkett
C.O.C. No.: 27375

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1048	0-6"	Brown	clayey silt tr. F sand wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

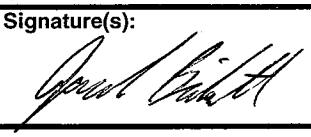
MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):



Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SS00800024
Sample Location: X02SB008
Sampled By: T. Rojahn
C.O.C. No.: 27375

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1053	0-24"	Light brown	silty clay tr. F sand w/ roots
Method: Hand core				moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025S00B0006
Sample Location: X025B001
Sampled By: J. Birkett
C.O.C. No.: 27375

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1108	0-6"	Dark brown and light brown	organic rich soil and silty clay some F sand
Method: Hand core				Moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

J. Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X025S001O024
Sample Location: X025B001
Sampled By: T. Rojahn
C.O.C. No.: 27375

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1112	0.24	Brown to light brown	clay some F sand tr F pebbles wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SS0020006
Sample Location: X02SB002
Sampled By: J. Birkett
C.O.C. No.: 27375

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1121	0-6"	Brown	F-M sand some clay tr pebbles
Method:				Moist w/ leafs and roots
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jarl Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X025S002O024
Sample Location: X025B002
Sampled By: T. Rojahn
C.O.C. No.: 27375

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1126	0-24"	Light brown	F. sand and clay tr. pebbles wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X0255003 0006
Sample Location: X025B003
Sampled By: J. Birkett
C.O.C. No.: 27376

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1135	0-6"	Brown to light brown	organic rich soil some clay tr. F-C pebbles moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD yes

Duplicate ID No.: —

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025S0030024
Sample Location: X025B003
Sampled By: T. Rojahn
C.O.C. No.: 27376

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	~~1139~~ 1330	0-24"	Light brown	F Sand tr. F-M pebbles and clay wet
Method: Hand core	1139			
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X025S0060006
Sample Location: X025B006
Sampled By: J. Birkett
C.O.C. No.: 27376

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1153	0-6"	Dark brown	organic rich soil some F sand tr. large pebbles moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X025S0060024
Sample Location: X025B006
Sampled By: T. Rojahn
C.O.C. No.: 27376

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-3-10	1156	0-24"	Brown and light brown	clay some F-M sand tr. M pebbles wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X0255005006
Sample Location: X025B005
Sampled By: J. Birkett
C.O.C. No.: 27376

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	0935	0-6"	Brown	organic soil and silt some F sand
Method: Hand core				tr. large pebbles
				moist
Monitor Readings				
(Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-020410-01

Signature(s):

Joel Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X025S005024
Sample Location: X025B005
Sampled By: T. Rajahn
C.O.C. No.: 27376

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	0937	0-24"	Brown to lightbrown	Silty clay tr. F sand and pebbles moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025S009O006
Sample Location: X025B009
Sampled By: J. Birkett
C.O.C. No.: 27376

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	0949	0-6"	Brown	organic soil and clay tr. F Sand
Method:				moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Jarod Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SS009 0024
Sample Location: X02SB009
Sampled By: TR
C.O.C. No.: 27377

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	0952	0-2	GREY	SANDY LOAM TR PLANT MATL
Method: HAND CORE			YEL BRN	SAND + SILT MOIST
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): FOR TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SS0100006
Sample Location: X02SB010
Sampled By: JB
C.O.C. No.: 27377

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	0959	0-6"	Dark brown	organic rich soil and F. sand moist
Method: Hand				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD yes

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SS0100024
Sample Location: X02SB010
Sampled By: TR
C.O.C. No.: 27377

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1002	0-2'	OLIVE GREY	SAND, SANDY LOAM
Method:			GREY	TR GRAVEL MOIST TO
HANDCORE				WET
Monitor Readings				
(Range in ppm):				
—				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): Scott Williams FOR TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: XO2SS0150006
Sample Location: XO2SB015
Sampled By: JB
C.O.C. No.: 27377

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1011	0-6	DK BRN	SANDY LOAM
Method: HAND CORE			YEL BRN	SAND TR SILT MOIST
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

FOR JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SS015 0024
Sample Location: X02SB015
Sampled By: TR
C.O.C. No.: 27377

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1014	0-24	YELBRN	SANDY SILT
Method: HAND CORE			MED BRN	↓
			DK BRN	SANDY LOAM
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Fred Warner FOR TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SS01400006
Sample Location: X02SB014
Sampled By: JB
C.O.C. No.: 27377

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1022	0-6"	DK BRN	SANDY LOAM
Method:			YEL BRN	SAND + SILT MOIST.
HAND CORE				
Monitor Readings				
(Range in ppm):				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): FOR JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SS0140024
Sample Location: X02SB014
Sampled By: TR
C.O.C. No.: 27377

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	~~1025~~ 1026			
Method: HAND CORE	1026	0-2'	YEL BRN	SAND W/TR SILT
			DK BR	TR CLAY
Monitor Readings				WET
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	X	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):
Fred M Kramer
FOR TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SS013000G
Sample Location: X02SB013
Sampled By: JB
C.O.C. No.: 27377

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1035	0-6"	DK BRN + YEL BRN	SANDY LOAM W/ TR GRAVEL + PLANT MATL. MOIST
Method: HAND CORE				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

FOR JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SS013 0 024
Sample Location: X02SB013
Sampled By: TR
C.O.C. No.: 27377

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1039	0-2'	DK BRN, OLIVE	GRAY SAND, SILT + CLAY
Method: HAND CORE				TR GRAVEL + PLANT MATL
				WET
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): FOR TR

Fred M Pamer

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SS0120006
Sample Location: X02SB012
Sampled By: JB
C.O.C. No.: 27377

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 2-4-10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE	1049	0-6"	DK GREY	SANDY LOAM
			YEL BRN	PLANT MATL.
Monitor Readings (Range in ppm):				& MOIST

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): Fred W Sauer
FOR JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X025S120024
Sample Location: X025B012
Sampled By: T. Rajahn
C.O.C. No.: 27377

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1053	0-24	Brown	F-M sand some clay
Method: Hand core				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X025B0110024
Sample Location: X025B011
Sampled By: T Rojahn
C.O.C. No.: 27377

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1103	0-24"	Brown	Clay to F Sand
Method:				wet
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Jack Bickett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X025S011C006
Sample Location: X025B011
Sampled By: J. Birkett
C.O.C. No.: 27377

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1106	0-6"	Brown	organics and clay tr. F sand wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025S01600006
Sample Location: X025B016
Sampled By: J. Birkett
C.O.C. No.: 27378

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1115	0-6"	Brown to light brown	Silt some F sand and organic soil
Method: Hand core				moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS016002Y
Sample Location: X02SB016
Sampled By: TR
C.O.C. No.: 27378

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1119	0-2'	YEL BRN	SAND TR SLT WET
Method: HAND CORE				TR PLANT MATL.
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD (YES) NO

Duplicate ID No.: (NO)

Signature(s):

FOR TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS0170006
Sample Location: X02SB017
Sampled By: JB
C.O.C. No.: 27378

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1124	0-6"	YEL BRN	SANDY LOAM MOIST
Method: HAND CORE			+DK GREY	TR PLANT MATL.
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): Scott Hansen FOR JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025501700 24
Sample Location: X025B017
Sampled By: T. Rajahn
C.O.C. No.: 27378

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1128	0-24"	Brown	Clay some F Sand
Method:				wet
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD (Yes)

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X025Soil80006
Sample Location: X025B018
Sampled By: J. Birkett
C.O.C. No.: 27378

[*] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other: _____
[ ] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1140	0-6"	Brown	F. sand some silt tr. M. pebbles
Method:				moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02550180024
Sample Location: X02SB018
Sampled By: T. Rajah
C.O.C. No.: 27378

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1141	0-24"	Brown to light brown	clay some F sand moist to wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SS0190006
Sample Location: X02SB019
Sampled By: JB
C.O.C. No.: 27378

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1149	0-6'	DK BRN	SANDY LOAM WET
Method: HAND CORE				TR PLANT MATL.
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): Fred Williams
FOR JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SS0190024
Sample Location: X02SB019
Sampled By: TR
C.O.C. No.: 27378

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1152	0-2'	DK BRN	SAND+SILT TR CLAY WET
Method: HAND CORE				TR PLANT MATL. TR GRA.
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): FOR TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SS020002
Sample Location: X02SB020
Sampled By: JB
C.O.C. No.: 27378

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1159	0-2'	GREY	SAND, SILT, CLAY
Method: HAND CORE			DK OLIVE	WET
			GREY	
Monitor Readings			BRN	
(Range in ppm):				
—				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): FOR JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SS020006
Sample Location: X02SB020
Sampled By: TR
C.O.C. No.: 27378

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1201	0-6"	DK BRN	SILTY LOAM PLANT MATL.
Method:				MOIST TO WET
HAND CORE				
Monitor Readings				
(Range in ppm):				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

FOR TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025502l0024
Sample Location: X025B021
Sampled By: J. Birkett
C.O.C. No.: 27378

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1256	0-24"	Brown	silty clay tr. F-M sand
Method:				moist
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025S0210006
Sample Location: X025B021
Sampled By: T. Rajah
C.O.C. No.: 27378

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1300	0-6"	Brown to light brown	organic soil and silt some F-M sand
Method: Hand core				tr. large pebbles
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X025S022000G
Sample Location: X025B022
Sampled By: T. Rajah
C.O.C. No.: 27378

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1307	0-6"	Brown to light brown	organic soil and silt some F-M sand
Method: Hard core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02550220024
Sample Location: X025B022
Sampled By: J. Birkett
C.O.C. No.: 27379

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1309	0-24"	Brown to light brown	clayey silt fr. F-M sand
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): FOR JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X025S0230006
Sample Location: X025B023
Sampled By: T. Rojahn
C.O.C. No.: 27379

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1318	0-6"	Brown	Silt some F sand
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02S0230024
Sample Location: X02SB023
Sampled By: J. Birkett
C.O.C. No.: 27379

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1320	0-24"	Brown	Silt some F-M sand
Method:				moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X025S0240006
Sample Location: X025B024
Sampled By: T. Rojahn
C.O.C. No.: 27379

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1330	0-6"	Brown to light brown	F sand and organic soil
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025S024O024
Sample Location: X025B024
Sampled By: J. Birkett
C.O.C. No.: 27379

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1332	0-24"	Brown	F-M sand tr. clay and small pebbles
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-020410-02

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X025S0250006
Sample Location: X025B025
Sampled By: T. Rojahn
C.O.C. No.: 27979

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1347	0-6"	Brown and light brown	organic rich soil and F-M sand
Method:				moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025S0250024
Sample Location: X025B025
Sampled By: J. Birkett
C.O.C. No.: 27379

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1350	0-24"	Brown	Organic rich soil and F sand tr. large pebbles moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

~~[X]~~ Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS03100006
Sample Location: X02SB031
Sampled By: T. Rojahn
C.O.C. No.: 27379

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1357	0-6"	Brown	organic rich soil and silt some F-M sand
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

~~[X]~~ Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS03I0024
Sample Location: X02SB031
Sampled By: J. Birkett
C.O.C. No.: 27379

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1400	0-24"	Dark brown to light brown	clay some F-M sand tr. small pebbles
Method:				moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Jarrod Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025503900006
Sample Location: X025B039
Sampled By: T. Rajahn
C.O.C. No.: 27379

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1408	0-6"	Brown	Organic rich soil and F-M Sand
Method:				moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02550390024
Sample Location: X025B039
Sampled By: J. Birkett
C.O.C. No.: 27379

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1410	0-24"	Light brown	F sand tr. clay and organics
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS0400006
Sample Location: X02SB04
Sampled By: T. Rojahn
C.O.C. No.: 27379

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1418	0-6"	Brown to Red-brown	Clayey silt some F sand and organics
Method:				Moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jason Burkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X025S040O024
Sample Location: X025B040
Sampled By: J. Birkett
C.O.C. No.: 27379

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1420	0-24"	Light brown	Clayey silt fr. F sand
Method:				moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	YES	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SS038O006
Sample Location: X02SB038
Sampled By: T. Rajah
C.O.C. No.: 27380

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-4-10	1430	0-6"	Brown	organic soil and F Sand
Method:				Moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: XO2SS0380024
Sample Location: XO2SB038
Sampled By: TR/JB
C.O.C. No.: 27380

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 2-4-10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1435	0-2'	MED BRN	DK BRN LOAM + SAND MOIST
Method:			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date: 2-4-10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE	1435	0-2'	DK BRN	LOAM
Monitor Readings (Range in ppm): —			MED BRN	SAND MOIST

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s): Fred Mann FOR TR/JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS03706 (TK)
Sample Location: X02SB03
Sampled By: TR
C.O.C. No.: 27383

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/10/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA (TK)	~~1255 (TK)~~ 1255	0-24"	D. Brown	V. Fine-Fine sand w/Pebbles
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS037G024
Sample Location: X02SB037
Sampled By: SBL
C.O.C. No.: 27383

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	~~1258~~	0-24"	red brn / brn	Sand w/ trace silt & gravel
Method:	1258			slightly moist
Hand Core				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS036 0006
Sample Location: X02SB036
Sampled By: SBL
C.O.C. No.: 27383

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1315	0-6"	red brn / dark brn	Silty sand w/ trace organics
Method: Hand Core				slightly moist
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS036D024
Sample Location: X02SB036
Sampled By: SBL
C.O.C. No.: 27383

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1318	0-24"	red brn / brn	Silty Sand w/ trace organics
Method:				slightly moist
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: XO2SS035a006
Sample Location: XO2SB035
Sampled By: TR
C.O.C. No.: 27383

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1329	0-6"	tan/light tan	Silty sand w/ trace organics.
Method: Hand Core				slightly moist
Monitor Readings (Range in ppm): ~				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page 1 of 1

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS0035 ~~0005~~ 0024
Sample Location: X02SB035
Sampled By: SBC
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1330	0-24"	red brn / brn	Sandy silt w/ clay
Method:				slightly moist
Hand Core				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SS03400[illegible]
Sample Location: X02SB034
Sampled By: TR
C.O.C. No.: 27383

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1345	0-24"	red brn / brn	Sandy Silt w/ trace organics slightly moist
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SS0340024
Sample Location: X02SB03
Sampled By: SC
C.O.C. No.: 27383

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/10/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE	1347	0-24"	D. Brown	Moist, V.F-Fine Silty Sand
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: XQ2SS033006
Sample Location: XQ2SR033
Sampled By: TR
C.O.C. No.: 27383

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1355	0-6"	redbrn / brn	Sandy Silt w/ trace organics
Method: Hand Core				Slightly moist.
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	FD031010-02

Signature(s):

For TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SS033D024
Sample Location: X02SB033
Sampled By: SBL
C.O.C. No.: 27383

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1358	0-24"	red brn / brn	Silty Sand w/ trace organics.
Method:				Slightly Moist.
Hand Core				
Monitor Readings				
(Range in ppm):				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SS032006
Sample Location: X02SB032
Sampled By: TR
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1412	0-6"	Brn	Sandy silt w/ clay and trace
Method:				Organics. Slightly moist
Hand Core				
Monitor Readings				
(Range in ppm):				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

For TR

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SS03D024
Sample Location: X02SB032
Sampled By: SAC
C.O.C. No.: 27383

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1414	0-24"	brn / light brn	Sandy Silt w/ trace organics slightly moist
Method: Hydrocore				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X025S026C006
Sample Location: X02SB026
Sampled By: SC
C.O.C. No.: 27384

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~ 3-10-10	Depth	Color	Description (Sand, Silt, Clay, ~~Moisture, etc.~~)
Time: ~~1422~~			
Method: ~~HandCore~~			
~~Monitor~~ Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date: 3-10-10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HandCore	1422	0-6"	Brn	Sandy Silt w/ trace organics. Wet
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD: NO

Duplicate ID No.: (FD) NO FD031010-03

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: XO2SS026002Y
Sample Location: XO2SS026
Sampled By: SBC
C.O.C. No.: 27384

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1425	0-24"	light brn	Sandy silt w/ some clay wet
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD: No

Duplicate ID No.: ~~NO~~ FD031010-03 (T2)

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SS027006
Sample Location: X02SB027
Sampled By: SBC
C.O.C. No.: 27384

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1435	0-6"	Brn	Sandy Silt With organics
Method: Hand Core				slightly moist
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SS027024
Sample Location: X02SB027
Sampled By: SBL
C.O.C. No.: 27384

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1438	0-24"	Brn / light brn	Silty Sand
Method: Hand Core				slightly moist
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XO2SS028 0CC
Sample Location: XO2SB028
Sampled By: SBC
C.O.C. No.: 27384

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1447	0-6"	Brn/light Brn	Sandy Silt W/ trace organics
Method: Handcore				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
ND	ND

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: XO2SS02B0004
Sample Location: XO 25B 028
Sampled By: SBC
C.O.C. No.: 27384

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1450	0-24"	Brn/Light Brn	Silty sand w/ trace Organics
Method: Hardcore				slightly moist
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO2SS0249006
Sample Location: XO2SB009
Sampled By: SBL
C.O.C. No.: 27384

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1458	0-6"	Dark brn	Sandy Silt w/ trace organics
Method: Hand Core				moist
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD: NO

Duplicate ID No.: NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X0255029024
Sample Location: X0255029
Sampled By: SBL
C.O.C. No.: 27384

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1500	0-24"	Brn / light brn	Silty Sand w/ trace organics
Method: Hand Core				moist to wet.
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X025S030006
Sample Location: X025B030
Sampled By: SBL
C.O.C. No.: 27384

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-10-10	1505	0-6"	Dark brn	Sandy Silt with organics
Method: Hand Core				Slightly moist
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD: YES ~~NO~~ (TR)

Duplicate ID No.: NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X025S03000024
Sample Location: X025B
Sampled By: SC
C.O.C. No.: 27384

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3/10/10	1509	0-24"	D. Brown	Moist, Silty Sand
Method: HA				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X12SB009020409
Sample Location: X02SB009
Sampled By: EB
C.O.C. No.: 27390

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0805	2-4'	Rust Brown	Moist, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XX25B009040G
Sample Location: XX25B009
Sampled By: EB
C.O.C. No.: 27390

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 5/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0810	4-6'	Rust Brown	Moist, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X025B005024
Sample Location: X025B005
Sampled By: EB
C.O.C. No.: 27390

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/18	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0910	2-4'	Gray/Rust	Moist/wet, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Burkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SB005 04-6
Sample Location: X02SB005
Sampled By: EB
C.O.C. No.: 27390

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0915	4-6'	Rust	Moist, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XQ2SB01002A
Sample Location: XQ2SB10
Sampled By: EB
C.O.C. No.: 27390

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0930	2-4'	Rust Brown	Moist, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s):

Ellen Berkheiser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XQ2SB01004
Sample Location: XQ2SB01
Sampled By: ER
C.O.C. No.: 27390

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0840	4-6'	Rust Brown to White (5Y-)	Moist, VF-Fine (Slightly Clayey) Sand (5Y) Moist, VF Fine Sandy Clay (4-5')
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SB006-0204
Sample Location: X02SB006
Sampled By: EB
C.O.C. No.: 27390

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0950	2-4'	Gray/Tan/Rust	Moist, VF.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SB006406
Sample Location: X02SB006
Sampled By: EB
C.O.C. No.: 27390

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0855	4-6'	Gray/Tan/Rust	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: XQ2SB0032024
Sample Location: XQ2SB003
Sampled By: EB
C.O.C. No.: 27390

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 3/12/10 Time: 0915 Method: DPT Monitor Reading (ppm): —	24'	Rust/Gray	Moist, VF-Fine Sandy Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SB003-0406
Sample Location: X02SB003
Sampled By: ER
C.O.C. No.: 27390

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10 Time: 0920 Method: DPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	4-6'	Gray	Moist, Hard Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkhite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XQ2SB002202
Sample Location: XQ2SB002
Sampled By: ER
C.O.C. No.: 27396

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0930	2-4'	Rust/Tan	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Ellen Berkeley

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X025B002046
Sample Location: X025B002
Sampled By: ER
C.O.C. No.: 27390

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0935	4-6'	Rust/Tan	Moist, VF,- Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XQ2SB001024
Sample Location: XQ2SB001
Sampled By: EB
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10 Time: 1015 Method: DPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	2-4'	Rust/Gray/Tan	Moist/wet, V.F.-Fine Sandy Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkeley

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SB001-0406
Sample Location: X02SB001
Sampled By: ER
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1025	4-6'	Rust/Gray/Tan	V. Fine-Fine Sandy Clay, Wet/Moist
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SB007024
Sample Location: X02SB007
Sampled By: EB
C.O.C. No.: 27391

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10 Time: 1350 Method: DPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	24'	Tan/Rust	VFine-Fine Sandy Clay, Moist

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SB0704-06
Sample Location: X02SB07
Sampled By: EB
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1355	4-6'	Tan/Rust	4'-5' V. Fine Fine Sandy Clay, Moist
Method: DPT		Green	5-6' Vi. Fine-Fine Clayey Sand, Wet
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SB008024
Sample Location: X02SB008
Sampled By: EB
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1445	24'	Rust/Gray	Moist, Hard Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkbite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SB008-04-0
Sample Location: X02SB08
Sampled By: EB
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1410	~~Rust~~ 6'	Rust	Moist, V.F-Fine clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

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Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: X02SB012004
Sample Location: X02SB012
Sampled By: EB
C.O.C. No.: 27391

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10 Time: 1420 Method: DPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	2-4'	Tan/Rust	Moist, V.F.-Fine Sandy Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

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Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XQ2SB02404
Sample Location: XQ2SB02
Sampled By: EB
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 3/12/04 Time: 1425 Method: DPT Monitor Reading (ppm): —	4-6	Gray/White	V.F-Fine-Med. ~~Sandy~~ Clayey Sand saturated at 5'

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SB26D204
Sample Location: X02SB26
Sampled By: EB
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1445	24'	Rust Tan	Moist, V. Fine-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: XQ25B26-0406
Sample Location: XQ25B26
Sampled By: EB
C.O.C. No.: 27391

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1430	4-6	Rust Tan	Moist, V.fine-fine Sand Clay Saturated at 5
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SB XQ02SB7024
Sample Location: XQ02SB7
Sampled By: EB
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1510	2-4'	Tan/Rust	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SB X02270401
Sample Location: X0227
Sampled By: EB
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1515	4-6'	Gray/White	V. Fine-Med. Clayey Sand (Moist) Saturated at 5'
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

Sample ID No.: XQ2SB01602
Sample Location: XQ2SB016
Sampled By: EB
C.O.C. No.: 27391

- [ ] Surface Soil
- [X] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: 3/2/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1530	2-4'	Rust Brown Gray	Moist, V.F. Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XQ2SB16-0406
Sample Location: XQ2SB16
Sampled By: ER
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1535	4-6'	Rust Brown Gray	Moist, Vf. Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SB018020K
Sample Location: X02SB018
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1555	24'	Rust Brown	Moist, V.F-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

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SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

Sample ID No.: X02SB01
Sample Location: X02SB01
Sampled By: EB
C.O.C. No.: 27392

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/12/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1000	4-6	Rust Brown	Moist, V.F.-Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SB032202
Sample Location: X02SB032
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/13/10
Time: 0920
Method: DPT
Monitor Reading (ppm): —

Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
24'	Tan	Moist, VF. - Fine Sandy Clay

COMPOSITE SAMPLE DATA:

Date: ~~3/13/10~~
Method: ~~#~~
Monitor Readings (Range in ppm):

Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other ~~X~~
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	✓
Metals	(1) 4oz Jar	✓	✓
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

~~X~~ Duplicate collected

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: FD031310-01

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XQ2SB032004
Sample Location: XQ2SB032
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/13/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0825	4-6'	Tan	Moist, V.F.-Fine Sandy Clay (45) Moist, V.F-Fine Clayey Sand (55)
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Burkhalter

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XQ2SB024020H
Sample Location: XQ2SB024
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1420	2-4'	Rust/Tan	Moist, VF, Fine Clayey Sand
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SB02404G
Sample Location: X02SB024
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1425	4-6'	Rust/Tan	Moist V.F.-Fine Clayey Sand
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SB014020H
Sample Location: X02SB014
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/16	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1445	2-4'	Rust/Tan	Moist, V.F-Fine Clayey Sand
Method: ~~GS~~ HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SB04-0406
Sample Location: X02SB04
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1450	4-6'	Rust/Tan	Moist, V.F.-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle If Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkleis

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB13102FF
Sample Location: X02SB13
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1530	2-4'	Rust/Brown	Moist, V.F.-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

*Duplicate

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: FD031510-03

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SB31**0**406
Sample Location: X02SB31
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1535	4-6'	Rust/Brown	Moist, V.F.- Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

*MS/MSD

MAP:

SEE FIGURE 18.2

Circle If Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X02SB04000204
Sample Location: X02SB040
Sampled By: EB
C.O.C. No.: 27392

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1550	2-4'	Rust/tan	Moist, Vf-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkte

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SB040040G
Sample Location: X02SB040040G
Sampled By: EB
C.O.C. No.: 27404

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/16	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1555	4-6'	Rust/Tan	Moist, V.F.-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): -			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SB035020304
Sample Location: X02SB035
Sampled By: ER
C.O.C. No.: 27404

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1610	24'	Rust	Moist, V. Fine-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

*pH, CEC, TOC

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkhite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X02SB035-0406
Sample Location: X02SB035
Sampled By: EB
C.O.C. No.: 27404

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1615	4-6'	Rust	Moist, V.F.-Fine clayey Sand
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

* pH, CEC, TOC

MAP:

SEE FIGURE 18.2

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkbite

APPENDIX F.4

SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 04

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27397 | PAGE 1 OF 1

PROJECT NO: CTO: 112G00810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412)921 8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SEA / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412)921 8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED. EX AB # 8631 2526 7719		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)								COMMENTS
									G	G	G	P	P				
									PRESERVATIVE USED			4°C	4°C				
												HCl	HNO3				
									TYPE OF ANALYSIS								
									Volatiles 40 ml Vials	Explosives 1L Amber Glass	Total Metals 500 250 ml HDPE	Dissolved Metals 500 250 ml HDPE					
3/13/10	1600	TB031310-01	QC	-	-	AQ		2	2								TRIP BLANK
3/13	1710	X04GW003	X04 GW003	-	-	GW		6	2	2	1	1					FROM WELL 26MW03
3/14	1025	X04GW002	GW 002	-	-	GW		15	6	6	3	→ RUN MS/MSD					26MW02
3/14	1335	X04GW001	GW 001	-	-	GW		5	2	2	1						26MW01
3/13	1710	X04GW003-F	GW 003	-	-	GW		1	-	-	-	1					26MW03
3/14	0000	FD031410-01	QC	-	-	GW		5	2	2	1						FROM X04GW002

BASIC IED ~~EIID~~ (TR) AREA (UXO 04)

1. RELINQUISHED BY Terry Rojahn	DATE 3-15-10	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY

1. RECEIVED BY FEDERAL EXPRESS	DATE 3-15-10	TIME 1900	
2. RECEIVED BY	DATE	TIME	
3. RECEIVED BY	DATE	TIME	

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | **CHAIN OF CUSTODY** | **NUMBER** 27410 | **PAGE** 1 **OF** 1

PROJECT NO: 112G00810 CTO 423	**FACILITY:** NSF INDIAN HEAD	**PROJECT MANAGER** R. BASINKI	**PHONE NUMBER** (412) 921-8308
SAMPLERS (SIGNATURE) Ellen Berkhite / Terry Hoak		**FIELD OPERATIONS LEADER** T. ROJAHN	**PHONE NUMBER** (412) 921-8857
		CARRIER/WAYBILL NUMBER FED. EX AB# 9631 2526 7708	

LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLKEN
ADDRESS 34 DOGWOOD LANE
CITY, STATE MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: VOLATILES 40ml VIAL	VOLATILES 40ml VIAL	EXPLOSIVES 8oz JAR	METALS 4oz JAR	VOLATILES 40ml VIALS	EXPLOSIVES 1L AMBER GLASS	METALS 500ml NDPE		COMMENTS
									CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	G	G	P	
									PRESERVATIVE USED	4°C	Na HSO4 MeOH 4°C	4°C	4°C	4°C/HCl	4°C	4°C/HNO3	
3/16	0930	RB031610-02	QC	-	-	AQ	G	5	—	—	—	—	2	2	1		DPT SLEEVES
3/16	0940	WB031610-01	QC	-	-	AQ	G	TR/5 3	—	—	—	—	2	~~2~~ TR	1		DI H_2O SOURCE
3/16	0940	TB031610-01	QC	-	-	AQ	G	2	—	—	—	-	2				TRIP BLANK
3/16	1030	WB031610-02	QC	-	-	AQ	G	3	—	—	—	—	2	-	1		TAP PICNIC AREA
3/16	1100	X04SB002 0204	SB002	2	4	SO	G	5	2	1	1	1					
3/16	1110	X04SB002 0406	↓	4	6	SO	G	5	2	1	1	1					
3/16	1140	X04SB001 0204	SB001	2	4	SO	G	5	2	1	1	1					
3/16	1150	X04SB001 0406	↓	4	6	SO	G	5	2	1	1	1					
3/16	1210	X04SB004 0204	SB004	2	4	SO	G	5	2	1	1	1					
3/16	1220	X04SB004 0406	↓	4	6	SO	G	5	2	1	1	1					
3/16	1225	X04SB005 0204	SB005	2	4	SO	G	5	2	1	1	1					
3/16	1230	X04SB005 0406	↓	4	6	SO	G	5	2	1	1	1					
3/16	1250	X04SB006 0204	SB006	2	4	SO	G	5	2	1	1	1					

1. RELINQUISHED BY Terry Hoak	DATE 3-16-10	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 3-16-10	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27411 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810 CTO 423	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER / ANNA MYKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Ellen Kendrick		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX AB# 863125267708		MIDDLETOWN PA

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: VOLATILES 40ml VIAL	VOLATILES 40ml VIAL	EXPLOSIVES 8oz JAR	METALS 4oz JAR	PH, CEC, TOC 8oz	COMMENTS
		BASIC IED AREA (UXO 04)						CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	G	G	G		
								PRESERVATIVE USED	Na HSO4	MeOH	4°C	4°C		
3/16	1255	X04SB006 0406	SB006	4	6	SO	G	5	2	1	1	1	+ TR	
3/16	1350	X04SB007 0204	SB007	2	4	SO	G	5	2	1	1	1		
3/16	1405	X04SB007 0406	↓	4	6	SO	G	5	2	1	1	1		
3/16	1425	X04SB008 0204	SB008	2	4	SO	G	6	2	1	1	1	1	
3/16	1435	X04SB008 0406	↓	4	6	SO	G	6	2	1	1	1	1	
3/16	1500	X04SB014 0204	SB014	2	4	SO	G	5	2	1	1	1		
3/16	1510	X04SB014 0406	↓	4	6	SO	G	5	2	1	1	1		
3/16	1530	X04SB009 0204	SB009	2	4	SO	G	5	2	1	1	1		
3/16	1540	X04SB009 0406	↓	4	6	SO	G	5	2	1	1	1		
3/16	1615	X04SB011 0204	SB011	2	4	SO	G	11	6	3	1	1		
3/16	1625	X04SB011 0406	↓	4	6	SO	G	11	6	3	1	1		
3/16	1650	X04SB010 0204	SB010	2	4	SO	G	5	2	1	1	1		
3/16	1700	X04SB010 0406	↓	4	6	SO	G	5	2	1	1	1		

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	3-16-10	1900	1. RECEIVED BY FEDERAL EXPRESS	3-16-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27412 | PAGE 1 OF 1

PROJECT NO: CTO 112G00810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLIKEN
SAMPLERS (SIGNATURE) Ellen Burkhalter		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED. EX AB # 8631 2526 7708		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: VOLATILES 40ml VIALS	VOLATILES 40ml VIALS 4ºC	EXPLOSIVES 8oz JAR	METALS 4oz JAR					COMMENTS
		BASIC IED AREA (UXO 04)							CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	G	G	G	
									PRESERVATIVE USED				NO	H2SO4	MeOH	4ºC	4ºC
3/16	0000	FD031610-02	QC	—	—	SO	G	5	2	1	1	1					FROM X04S80070204
3/16	0000	FD031610-03	QC	—	—	SO	G	5	2	1	1	1					X04SB0090406
3/16	1030	TB031610-02	QC	—	—	QC	G	3	2	1							TRIP BLANK

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tay Boyd	3-16-10	1900	1. RECEIVED BY FEDERAL EXPRESS	3-16-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27413 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412)921-8308
SAMPLERS (SIGNATURE): Ellen Berkelite		FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8857
		CARRIER/WAYBILL NUMBER: FED EX AB # 8631 2526 3893	

LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER. / ANNA MILLIKEN

ADDRESS: 34 DOGWOOD LANE

CITY, STATE: MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
		BASIC IED AREA (UXO 04)								G	G	G	G					
									PRESERVATIVE USED		Na HSO4 4°C	NaOH 4°C	4°C					
									TYPE OF ANALYSIS		Volatiles 40ml Vials	Volatiles 40ml Vials	Explosives 8oz JAR	Metals 4oz JAR				
3/17	0845	X04SB00030204	SB 003	2	4	SO	G	5		2	1	1	1					
3/17	0855	X04SB003 0406	↓	4	6	SO	G	5		2	1	1	1					
3/17	0910	X04SB013 0204	SB 013	2	4	SO	G	5		2	1	1	1					
3/17	0918	X04SB013 0406	↓	4	6	SO	G	5		2	1	1	1					
3/17	0930	X04SB017 0204	SB 017	2	4	SO	G	5		2	1	1	1					
3/17	0940	X04SB017 0406	↓	4	6	SO	G	5		2	1	1	1					
3/17	1000	X04SB020 0204	SB 020	2	4	SO	G	5		2	1	1	1					
3/17	1005	X04SB020 0406	↓	4	6	SO	G	5		2	1	1	1					
3/17	1020	X04SB019 0204	SB 019	2	4	SO	G	5		2	1	1	1					
3/17	1030	X04SB019 0406	↓	4	6	SO	G	5		2	1	1	1					
3/17	1100	X04SB018 0204	SB 018	2	4	SO	G	5		2	1	1	1					
3/17	1110	X04SB018 0406	↓	4	6	SO	G	5		2	1	1	1					
3/17	1200	X04SB012 0204	SB 012	2	4	SO	G	5		2	1	1	1					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Terry Rojahn	03/18/10	1830	1. RECEIVED BY: FEDERAL EXPRESS	03/19/10	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27418 | PAGE 1 OF 1

PROJECT NO: CTO 112600810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-9308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX AB# 8631 2526 3893		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Volatiles 40ml Vials 4°C	Volatiles 40ml Vials MeOH	Explosives 8oz Jar 4°C	Metals 4oz Jar 4°C	Explosives/Metals Zip Lock Bags 4°C	Volatiles 40ml Vials HCl 4°C	Metals 500ml HDPE HNO3 4°C	Explosives 1L Amber Glass 4°C	COMMENTS
		CONTAINER TYPE PLASTIC (P) or GLASS (G)							G	G	G	G	P	G	P	G	
		PRESERVATIVE USED							Na HSO4 4°C	MeOH	4°C	4°C	4°C	4°C/HCl	4°C/HNO3	4°C	
		BASKIED AREA (UXO 04)															
3/17	1210	X04SB012 0406	SB 012	4	6	SO	G	5	2	1	1	1	1				
3/17	1300	X04SB015 0204	SB 015	2	4	SO	G	5	2	1	1	1	1				
3/17	1310	X04SB015 0406	↓	4	6	SO	G	5	2	1	1	1	1				
3/17	1320	X04SB016 0204	SB 016	2	4	SO	G	5	2	1	1	1	1				
3/17	1330	X04SB016 0406	↓	4	6	SO	G	5	2	1	1	1	1				
3/17	1500	RB031710-02	QC	—	—	AQ	G	5	—	—	—	—	—	2	1	2	HAND CORER
3/17	1520	X04SS020 0024	SB 020	0	2	SO	C	4	2	1	—	—	1				
3/17	1528	X04SS020 0006	↓	0	0.5	SO	C	4	2	1	—	—	1				
3/17	1300	X04SS003 0006	SB 003	0	0.5	SO	C	4	2	1	—	—	1				
3/17	1305	X04SS003 0024	↓	0	2	SO	C	4	2	1	—	—	1				
3/17	1315	X04SS010 0024	SB 010	0	2	SO	C	4	2	1	—	—	1				
3/17	1320	X04SS010 0006	↓	0	0.5	SO	C	4	2	1	—	—	1				
3/17	1337	X04SS011 0024 (DUP)	SB 011	0	2	SO	C	4	2	1	—	—	1				

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tay Rook	03/18/10	1830	1. RECEIVED BY FEDERAL EXPRESS	03/19/10	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27419 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8857	ADDRESS: 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER: FED. EX. AB# 863125263893		CITY, STATE: MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: VOLATILES 40ml VIALS	VOLATILES 40ml VIALS	EXPLOSIVES 8oz JAR	METALS 4oz JAR	EXPLOSIVES/METALS ZIP LOCK BAGS	COMMENTS
		BASIC IED AREA (UXO 04)							CONTAINER TYPE: G	G	G	G	P	
									PRESERVATIVE USED: Na HSO4	MEOH	4°C	4°C	4°C	
3/17	1340	X04SS011 0024	SB 011	0	2	SO	C	4	2	1	—	—	1	
3/17	1355	X04SS012 0006	SB 012	0	0.5	SO	C	4	2	1	—	—	1	
3/17	1400	X04SS012 0024	↓	0	2	SO	C	4	2	1	—	—	1	
3/17	1415	X04SS013 0006	SB 013	0	0.5	SO	C	4	2	1	—	—	1	
3/17	1420	X04SS013 0024	↓	0	2	SO	C	4	2	1	—	—	1	
3/17	1430	X04SS015 0006	SB 015	0	0.5	SO	C	4	2	1	—	—	1	
3/17	1435	X04SS015 0024	↓	0	2	SO	C	4	2	1	—	—	1	
3/17	1455	X04SS016 0006	SB 016	0	0.5	SO	C	4	2	1	—	—	1	
3/17	1500	X04SS016 0024	↓	0	2	SO	C	4	2	1	—	—	1	
3/17	1515	X04SS017 0006	SB 017	0	0.5	SO	C	4	2	1	—	—	1	
3/17	1520	X04SS017 0024	↓	0	2	SO	C	4	2	1	—	—	1	
3/17	1545	X04SS019 0006	SB 019	0	0.5	SO	C	4	2	1	—	—	1	
3/17	1550	X04SS019 0024	↓	0	2	SO	C	4	2	1	—	—	1	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	3/18/10	1830	1. RECEIVED BY: FEDERAL EXPRESS	3/18/10	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27420 | PAGE 1 OF 1

PROJECT NO: CTO 112600810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER. / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX 48# 8631 2526 3893		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
		BASIC IED AREA (UXO 04)							G	G	G	G	P	G				
									PRESERVATIVE USED			NA HSO4	MEOH	4°C	4°C	4°C	4°C	
									TYPE OF ANALYSIS	VOLATILES 40 ml VIALS	VOLATILES 40 ml VIALS 4°C	EXPLOSIVES JAR 8oz	METALS 4oz JAR	EXPLOSIVES/MEMIS ZIP LOCK BAGS	PH, CGC & TOC 8oz JAR			
3/17	1615	X04SS018 0006	SB 018	0	0.5	SO	C	4		2	1	-	-	1				
3/17	1620	X04SS018 0024	↓	0	2	SO	C	4		2	1	-	-	1				
3/17	1630	X04SS014 0006	SB 014	0	0.5	SO	C	4		2	1	-	-	1				
3/17	1635	X04SS014 0024	↓	0	2	SO	C	4		2	1	-	-	1				
3/18	0900	X04SS009 0006	SB 009	0	0.5	SO	C	~~10~~ 11 (TR)		6	3	-	-	1	1			RUN MS/MSD
3/18	0905	X04SS009 0024	↓	0	2	SO	C	4		2	1	-	-	1				
3/18	0935	X04SS008 0006	SB 008	0	0.5	SO	C	4		2	1	-	-	1				
3/18	0935	X04SS008 0024	↓	0	2	SO	C (TR)	~~4~~ 5		2	1	-	-	1	1			
3/18	1010	X04SS007 0006	SB 007	0	0.5	SO	C	4		2	1	-	-	1				
3/18	1015	X04SS007 0024	↓	0	2	SO	C	4		2	1	-	-	1				
3/18	1035	X04SS006 0006	SB 006	0	0.5	SO	C	4		2	1	-	-	1				
3/18	1040	X04SS006 0024	↓	0	2	SO	C	4		2	1	-	-	1				
3/18	1055	X04SS005 0006	SB 005	0	0.5	SO	C	10		6	3	-	-	1				RUN MS/MSD

1. RELINQUISHED BY Ty Rojahn	DATE 3-18-10	TIME 1830	1. RECEIVED BY FEDERAL EXPRESS	DATE 3-18-10 TIME 1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27421 | PAGE 1 OF 1

PROJECT NO: CTO 112G00810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8808	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX AB # 8631 2526 3893		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)								PRESERVATIVE USED						COMMENTS
		BASIC IED AREA (UXO 04)							G	G	G	G	P				4°C	4°C	NaHSO4	MeOH	4°C		
TYPE OF ANALYSIS									EXPLOSIVES 8oz JAR	METALS 4oz JAR	VOLATILES 40ml VIALS	VOLATILES 40ml VIALS 4°C	EXPLOSIVES/METALS ZIP LOCK BAGS										
3/18	1100	X04SS0050024	SB 005	0	2	SO	C	4	+ (TS)	+	2	1	1										
3/18	1105	X04SS004 0006	SB 004	0	0.2	SO	C	4	-	-	2	1	1										
3/18	1120	X04SS004 0024	↓	0	2	SO	C	4	-	-	2	1	1										
3/18	1140	X04SS001 0006	SB 001	0	0.5	SO	C	4	-	-	2	1	1										
3/18	1145	X04SS001 0024	↓	0	2	SO	C	4	-	-	2	1	1										
3/18	1155	X04SS002 0006	SB 002	0	0.5	SO	C	4	-	-	2	1	1										
3/18	1200	X04SS002 0024	↓	0	2	SO	C	4	-	-	2	1	1										
3/18	0000	FD03/8/10-01	QC	-	-	SO	C	4	-	-	2	1	1										X04SS008 0006
3/18	0000	FD03/8/10-02	QC	-	-	SO	C	4	-	-	2	1	1										X04SS007 0024
3/17	0900	TB03/7/10-01	QC	-	-	SO	G	3	-	-	2	1											TRIP BLANK
3/18	0830	TB03/8/10-01	QC	-	-	SO	G	3	-	-	2	1											TRIP BLANK

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	3-18-10	1830	1. RECEIVED BY FEDERAL EXPRESS	3-18-10	1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location:
QA Sample Type:

Sample ID Number: WB031610-01
Sampled By: T. ROSAHN
C.O.C. Number: 27410

[] Trip Blank
[■] Source Water Blank
[] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-16-10
Time: 0940
Method: Direct Pour into Containers

WATER SOURCE:

[] Laboratory Prepared
[■] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H_2O
Supplier: FIELD ENV
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: NA
Equipment Used: NA
Equipment Type:
[] Dedicated } NA
[] Reusable }

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	(YES) / NO
Explosives	Cool 4°C	(2) 1 L Amber Glass	YES / (NO)
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) / NO
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Ted Rosahn

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location:
QA Sample Type:

Sample ID Number: WB031610-02
Sampled By: T. ROSAHN
C.O.C. Number: 27410

[] Trip Blank
[■] Source Water Blank
[] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-16-10
Time: 1030
Method: Direct FROM TAP

WATER SOURCE:

[] Laboratory Prepared
[] Purchased
[] Other
[■] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NA
Supplier:
Manufacturer:
Order Number:
Lot Number:
Expiration Date:

RINSATE INFORMATION (If Applicable):

Media Type: NA
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	(YES) NO
Explosives	Cool 4°C	(2) 1 L Amber Glass	YES (NO)
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) NO
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES (NO)

OBSERVATIONS / NOTES:

TAP LOCATED @ PICNIC AREA ALONG ARCHER AVE. NEXT to the PAVILION

Signature(s):

Ty Rosahn

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: TB031610-01
Sampled By: T. ROJAHN
C.O.C. Number: 27410

[x] Trip Blank
[] Source Water Blank
[] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-16-10
Time: 0940
Method: LAB PREPARED (BLANK W/PRES.)

WATER SOURCE:

[x] Laboratory Prepared
[] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NA
Supplier:
Manufacturer:
Order Number:
Lot Number:
Expiration Date:

RINSATE INFORMATION (If Applicable):

Media Type: NA
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	YES / (NO)
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES / (NO)
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	(YES) / NO

OBSERVATIONS / NOTES:

Signature(s):

Tony Rojahn

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location:
QA Sample Type:

Sample ID Number: TB031610-02
Sampled By: T. ROJAHN
C.O.C. Number: 27412

[] Trip Blank
[] Source Water Blank
[] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-16-10
Time: 1030
Method: AQ TRIP BLANK

WATER SOURCE:

[■] Laboratory Prepared
[] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NA
Supplier:
Manufacturer:
Order Number:
Lot Number:
Expiration Date:

RINSATE INFORMATION (If Applicable):

Media Type: NA
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	(YES) / NO
Explosives	Cool 4°C	(2) 1 L Amber Glass	YES / (NO)
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES / (NO)
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: TB031710-01
Sampled By: T. ROJAHN
C.O.C. Number: 27421

[■] Trip Blank
[] Source Water Blank
[] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-17-01
Time: 0800
Method: LAB PREPARED (BLANK w/Pres.)

WATER SOURCE:

[■] Laboratory Prepared
[] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NA
Supplier:
Manufacturer:
Order Number:
Lot Number:
Expiration Date:

RINSATE INFORMATION (If Applicable):

Media Type: NA
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	YES / (NO)
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES / (NO)
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	(YES) / NO

OBSERVATIONS / NOTES:

Signature(s): T. Rojahn

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: TB031810-01
Sampled By: T. ROJAHN
C.O.C. Number: 27421

[x] Trip Blank
[] Source Water Blank
[] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-18-10
Time: 0830
Method: LAB PREPARED (BLANK WIPES.)

WATER SOURCE:

[x] Laboratory Prepared
[] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NA
Supplier:
Manufacturer:
Order Number:
Lot Number:
Expiration Date:

RINSATE INFORMATION (If Applicable):

Media Type: NA
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	YES / (NO)
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES / (NO)
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	(YES) / NO

OBSERVATIONS / NOTES:

Signature(s):

Tony Rojahn

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031610-02
Sampled By: T. ROJAHN
C.O.C. Number: 27410

[] Trip Blank
[] Source Water Blank
[x] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-16-10
Time: 0930
Method: POUR THROUGH SLEEVE

WATER SOURCE:

[] Laboratory Prepared
[x] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENV.
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: Soil
Equipment Used: DPT SAMPLE SLEEVE
Equipment Type:
[x] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	(YES) / NO
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) / NO
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Tony Rojahn

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031710-02
Sampled By: T. ROJAHN
C.O.C. Number: 27418

[] Trip Blank
[] Source Water Blank
[X] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-17-10
Time: 1500
Method: POUR OVER HAND CORE

WATER SOURCE:

[] Laboratory Prepared
[X] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H_2O
Supplier: FIELD ENV
Manufacturer: NERL
Order Number: -
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: SOIL
Equipment Used: HAND CORE
Equipment Type:
[] Dedicated
[X] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	(YES) / NO
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) / NO
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Ted Rojahn

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XD4SB01204
Sample Location: XD4SB01
Sampled By: ER
C.O.C. No.: 27410

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/16	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0930	24'	Tan/Rust	Moist, V.F. Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X045B002-0406
Sample Location: X045B002
Sampled By: EB
C.O.C. No.: 27410

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/16	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1118	4-6'	Tan/Rust	Moist, V.F, Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Burkitt

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XA4SB001024
Sample Location: XA4SB001
Sampled By: EB
C.O.C. No.: 27410

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1140	24'	Tan/Rust	Moist, V.F. Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XHSB0010406
Sample Location: XHSB001
Sampled By: EB
C.O.C. No.: 27410

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1150	4-6'	Rust/Tan	Moist, V.F-Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkshire

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SB004-0204
Sample Location: X04SB004
Sampled By: EB
C.O.C. No.: 27410

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1310	2-4	Rust/Tan	Moist, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB004040
Sample Location: X04SB004
Sampled By: EB
C.O.C. No.: 27410

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1320	2-4'	Rust/Tan	Moist, V.F. Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkhite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB005R204
Sample Location: X04SB105
Sampled By: EB
C.O.C. No.: 27410

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1235	2-4'	Rust/tan	Moist, V.F.-Fine ~~Sand~~ ~~Clayey~~ Sandy clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB105041L
Sample Location: X04SB105
Sampled By: EB
C.O.C. No.: 27410

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1230	4-6'	Rust/Tan	Moist, V.F.-Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkheiser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XH43B006024
Sample Location: XH43B006
Sampled By: ER
C.O.C. No.: 27410

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1230	24'	Rust/tan	Moist, V.F. Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB006040
Sample Location: X04SB006
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/11 Time: 1255 Method: DPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	4-6	Rust/ Tan	Moist, V.F.-Fine Clayey Sand

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XX45B00702A4
Sample Location: XX45B007
Sampled By: ER
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1350	2-4	Tan/Rust	Moist, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	✓ —	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

*Duplicate

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.: FD031610-02
—	

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X045B007O406
Sample Location: X045B007
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1405	4-6'	Tan/Rust	Moist, V.F-Fine clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkhiser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB008R04
Sample Location: X04SB008
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10 Time: 1425 Method: PPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	24	Rust/Tan	Moist, V.F. Fine Sandy Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

pH, CEC, TOC

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB008401
Sample Location: X04SB008
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1435	4-6	Rust/Tan	Moist, V. Fine-Fine Sandy Clay
Method: DPT		Gray	Moist, Hard Clay
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

pH, CEC, TOC

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] ~~Subsurface Soil~~
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X0458014Q04
Sample Location: X0458014
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/16	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1580	2-4'	Tan/Rust	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB14040406
Sample Location: X04SB14
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/06	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1540	Tan/Rust Gray	4-6	Moist, VF, Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	✓ —	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SB009004
Sample Location: X04SB089
Sampled By: EB
C.O.C. No.: 27411

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1530	2-4'	Tan/Gray	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar ✓	✓	
Metals	(1) 4oz Jar ✓	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

[illegible]

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: [illegible]

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB009046
Sample Location: X04SB009
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/16/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1540	4-6	Tan/Gray	Moist, Hard Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

* Duplicate

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD —

Duplicate ID No.: FD031610-03

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB01102O4
Sample Location: X04SB01
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10 Time: 1015 Method: DPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	2-4'	Tan/Rust	Moist, V. Fine-Fine Sandy Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	✓ —	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MS/MSD

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB011040G
Sample Location: X04SB011
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 3/16/16	4-6'	Tan/Gray	Moist, Hard Clay
Time: 1625			
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MS/MSD

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Sample ID No.: XA4SB0100204
Sample Location: XA4SB010
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 3/16/10 Time: 1058 Method: DPT Monitor Reading (ppm): —	2-4'	Rust/Tan	Moist, V.F.-Fine Clayey Sand

COMPOSITE SAMPLE DATA:

Date: 3/16/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: DPT				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	✓ —	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X045B0100406
Sample Location: X045B010
Sampled By: EB
C.O.C. No.: 27411

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/4/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1400	4-6'	Rust/tan	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XG4SB003004
Sample Location: XG4SB003
Sampled By: EB
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0845	2-4'	Rust/Brown	Moist, V.F-Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XA45B003040
Sample Location: XA45B003
Sampled By: EB
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0955	4-6'	Rust/Brown	Moist, V.F.-Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	✓ —	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XOHSB13204
Sample Location: XOHSB13
Sampled By: EB
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/16	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0910	2-4	Tan	Moist, V.F. Fine Sandy clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X045B01304
Sample Location: X045B013
Sampled By: EB
C.O.C. No.: 27413

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0918	4-6	Tan	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X04SB07024
Sample Location: X04 SB07
Sampled By: EB
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0930	2-4'	Tan	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XA4SB017046
Sample Location: XA4SB017
Sampled By: EB
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0940	4-6	Tan	Wet, V.F.-Fine Sandy Clay
Method: DPT			Moist V.F.-Fine Sand
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkhite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: XO4SB0200204
Sample Location: XO4SB020
Sampled By: EB
C.O.C. No.: 27413

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1000	2-4'	Rust/Tan	Moist, Hard Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO4SB02004A
Sample Location: XO4SB02
Sampled By: EB
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1085	4-6'	Rust/Tan	Moist, V.F-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] ~~Subsurface~~ Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: ~~SS~~ X04SB019024
Sample Location: X04SB019
Sampled By: EB
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1020	24'	Tan/Rust	Moist V.F. Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Burkitt

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB019-0406
Sample Location: X04SB019
Sampled By: ER
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1036	4-6'	Tan/Rust	Moist, V.F. Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB018Q04
Sample Location: X04SB018
Sampled By: EB
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1100	2-4'	Tan/Rust	Moist, Hard Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO4SB018044b
Sample Location: XO4SB018
Sampled By: EB
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1110	4-6'	Tan/Rust	Moist, V.F-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X04SB012024
Sample Location: X04SB012
Sampled By: ER
C.O.C. No.: 27413

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1200	2-4	Tan/ Gray	Moist, Heard clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB012-0406
Sample Location: X04SB012
Sampled By: EB
C.O.C. No.: 27418

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1310	4-6	Tan/Gray	Moist, Hard Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Ellen Burkhardt

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB015024
Sample Location: X04SB015
Sampled By: EB
C.O.C. No.: 27418

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1320	2-4'	Gray/Tan	Moist, Hard Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SB01504a
Sample Location: X04SB015
Sampled By: EB
C.O.C. No.: 27418

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1310	4-6'	Tan/Rust	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO4SB01502A
Sample Location: XO4SB015
Sampled By: EB
C.O.C. No.: 27418

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1350	2-4'	Gray/tan	Moist, Hard clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	—	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SB016-0406
Sample Location: X04SB016
Sampled By: EB
C.O.C. No.: 27918

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1330	4-6'	Rust/tan	Moist, V.F. Fine Sandy clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	✓ —	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS02000[illegible]
Sample Location: X04SB002
Sampled By: SC
C.O.C. No.: 27418

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND Core HA (EC)	1520	0-24"	Brown/Tan	Moist, V.F-Fine Sandy Clay with Organics/pebbles
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Terry Lail FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: XA4SS0200006
Sample Location: XA4SB020
Sampled By: TR
C.O.C. No.: 27418

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HA	1528	0-6"	D. Brown	Moist, V.F.-Fine Sandy Clay with pebbles/organics
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Terry Lapak

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X045S0030006
Sample Location: X043B003
Sampled By: ~~EB~~ TE
C.O.C. No.: 27418

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

Composite

~~GRAB~~ SAMPLE DATA: Composite

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1300	0-6"	Tan/Brown	Moist, V.F.-Fine Sandy Clay with organics
Method: ~~HA~~ Hand Core			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Terry Rogal

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS003 0024
Sample Location: X04SB003
Sampled By: SC
C.O.C. No.: 27418

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE ~~HA~~ (TC)	1305	0-24"	D.Brown/Tan	M(S+)y V.F.-Fine Sandy Clay with pebbles/Organics
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tony Lopil FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X04SS01100324
Sample Location: X04SB010
Sampled By: SC
C.O.C. No.: 27418

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: ~~HAND~~ HAND CORE	1315	0-24"	Brown/Tan	Moist, VF-Sandy Clay with organics/pebbles
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tony Lozier FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS01000016
Sample Location: X04SB010
Sampled By: TR
C.O.C. No.: 27418

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1320	0-6"	D.Brown/Gray	V.F-Fine Sandy Clay, with pebbles/organics
Method: HAND Core				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Terry Rozahn

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS01I0006

Sample Location: X04SB01I

Sampled By: TR

C.O.C. No.: 27418

~~X~~ Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

Composite

SAMPLE DATA: Composite Samples

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1337	0-6"	D. Brown	Moist, V.F.-Fine Sandy Clay with organics
Method: ~~HA~~ Hand Core			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	✓ Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tim Kopal

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X045S01I0024
Sample Location: X045B01I
Sampled By: SO
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

Composite

~~GRAB~~ SAMPLE DATA: COMPOSITE SAMPLE

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1340	0-24"	D. Brown	Moist, V. Fine Sandy Clay
Method: (TP) HA HAND CORE			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Terry Rogers FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS012000G
Sample Location: X04SB012
Sampled By: TR
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND Core HA (JK)	1355	0-6"	D. Brown/Gray	Moist, V.F. Sandy Clay with Organics
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Terry Rogers

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X0455012002A
Sample Location: X0455B012
Sampled By: SC
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/20	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND Core HA (TC)	1400	0-24"	Brown/Gray	Moist, V.F. Sandy Clay
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Terry Rogalski FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS01B0006
Sample Location: X04SB013
Sampled By: TL
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

Composite

SAMPLE DATA: COMPOSITE SAMPLE

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1415	0-6"	D. Brown	V. Fine - Fine Sandy Clay with organics
Method: ~~HA~~ Hand Core			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Terry Lee

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS0130024
Sample Location: X04SB013
Sampled By: SC
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1420	0-24"	D. Brown	Moist, V.F. Sandy Clay
Method: HAND CORE HA (TC)				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Taylor for SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS0150006
Sample Location: X04SB015
Sampled By: TR
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1430	0-6"	D. Brown/Gray	Moist, V.F. Sandy Clay with organics
Method: HA (GT) HAND CORE				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Terry Royal

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: XO4SS0150024
Sample Location: XO4SB015
Sampled By: ~~TR~~ SC
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

composite

~~GRAB~~ SAMPLE DATA: Composite Sample

Date: 3/17/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1435	0-24"	D. Brown	V. Fine Sandy Clay, Moist with pebbles/organics
Method: ~~HA~~ Hand Core			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tyler Lopez FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X04SS0160006
Sample Location: X04SB016
Sampled By: TR
C.O.C. No.: 27419

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA (TR)	1455	0-6"	D. Brown/Gray	Moist, V.F. Sandy Clay with organics
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag		
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X045S0160024
Sample Location: X045B016
Sampled By: SC
C.O.C. No.: 27419

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/19/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1500	0-24"	D. Brown	V.F-Sandy Clay, Moist
Method: HAND CORE ~~HA~~ (JA)				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Terry Rozier FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS01T0006
Sample Location: X04SB01T
Sampled By: TR
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND Core HA (TR)	1515	0-6"	D. Brown/Gray	Moist, V.F-Fine Sandy Clay w/ Organics + pebbles
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Terry Lopez

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS017002Y
Sample Location: X04SB017
Sampled By: SC
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1520	0-24"	Brown/Tan	Moist, V.F. Sandy Clay
Method: HAND CORE HA (TC)				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tony Royster FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X04SS0190006
Sample Location: X04SB019
Sampled By: TR
C.O.C. No.: 27419

Type of Sample:
[X] Low Concentration
[] High Concentration

Composite

SAMPLE DATA:

Date: 3/19/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1545	0-6"	D. Brown/ Tan	Mrist, V. F. - Fine clayey Silt with pebbles/organics
Method: HA HandCore			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: ____

Signature(s):

Terry Kozaka

*0012

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS0190024
Sample Location: X04SB019
Sampled By: SC
C.O.C. No.: 27419

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA (TC)	1550	0-24"	Brown/Tan	Moist, Clayey V.F.-F the Sand with pebbles
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Terry Royal FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS018D006
Sample Location: X04SB018
Sampled By: TR
C.O.C. No.: 27420

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE ~~HA~~ TR	1615	0-6"	D. Brown/Tan	Moist, V.F-Fine Sand Clay w/ organics
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Terry Lopik

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: XH55018 0024
Sample Location: XH55018
Sampled By: SC
C.O.C. No.: 27420

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA (TK)	1620	0-24"	Gray/Tan	Moist, V.F. Sandy Clay
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Terry Rozier FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X045S01400006
Sample Location: X045B014
Sampled By: TR
C.O.C. No.: 27420

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1630	0-6"	P. Brown	Moist, VF Sandy Clay
Method: Hand Core HA (TR)				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Terry Hall

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X04SS0140024
Sample Location: X04SB014
Sampled By: ~~TR~~ SC
C.O.C. No.: 27420

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/17/10
Method: HAND CORE HA (EC)
Monitor Readings (Range in ppm):

Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1635	0-24"	Brown/Tan	Moist, V.F. Sandy Clay

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ty Rogal FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X045S009006
Sample Location: X045B009
Sampled By: TC/SL
C.O.C. No.: 27420

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/16/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0900	0-6"	Black/Tan	Moist, Clayey Silt w/Organics
Method: HAND Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD Yes

Duplicate ID No.: No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SS009002
Sample Location: X04SB009
Sampled By: SC
C.O.C. No.: 27420

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/18/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND AUGER	0905	0-24"	Tan/D. Brown	Moist, V.F. - Fine Clayey Sand
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tony Hall for SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS008 0006
Sample Location: X04SS008
Sampled By: [redacted] / TR
C.O.C. No.: 27420

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-18-10	0935	0-6"	tan/dark brn	Sandy Silt w/ Trace organics.
Method: Hand Core				Moist to Wet
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	No	
Metals	(1) 4oz Jar	No	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	FD031810-01

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS00801024
Sample Location: X04SB008
Sampled By: SGC
C.O.C. No.: 27420

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-18-10	0935	0-24"	light brn	S,t,w/ fine sand & organics.
Method:				Moist to wet.
HandCore				
Monitor Readings				
(Range in ppm):				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	No	
Metals	(1) 4oz Jar	No	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X045500T0006
Sample Location: X045B007
Sampled By: TR
C.O.C. No.: 27420

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/18/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1010	0-6"	Tan/D.Brown	Wet, V.Fine-Sandy clay w/ organics + gravel
Method: HAND Core HA				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X04SS0070024
Sample Location: X04SB057
Sampled By: SBC
C.O.C. No.: 27420

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-18-10	1015	0-24"	Brn	Silty Some Sand + organics, Moist
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	~~No~~ Yes	
Explosives	(1) 8oz Jar	No	
Metals	(1) 4oz Jar	No	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	~~No~~ FD031810-02

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS00610006
Sample Location: X04SB006
Sampled By: TR
C.O.C. No.: 27420

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-16-10	1035	0-6"	brn	Clayey silt w/ trace sand + organics
Method:				Moist
Auger Core				
Monitor Readings				
(Range in ppm):				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	YES	
Explosives	(1) 8oz Jar	No	
Metals	(1) 4oz Jar	No	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS0060024
Sample Location: X04SB006
Sampled By: SBC
C.O.C. No.: 27420

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-18-10	1040	0-24"	Light Brown	Clayey Silt w/ trace sand and Organics. Moist
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	No	
Metals	(1) 4oz Jar	No	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS0050006
Sample Location: X04SB005
Sampled By: TR
C.O.C. No.: 27420

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/18/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HA (TR) HAND CORE	1055	0-6"	Brown/Tan	Moist, V.f.-Fine Sandy Clay
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
Yes	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X04SS00550024
Sample Location: X04SS005
Sampled By: SRC
C.O.C. No.: 27421

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-18-10	1100	0-24"	light tan	Slt w/ some Sand and trace organics, Moist
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	No	
Metals	(1) 4oz Jar	No	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X04SS0140006
Sample Location: X04SB004
Sampled By: SBL
C.O.C. No.: 27421

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3-18-10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: Hand Core	1115	0-6"	dark brn	Clayey Silt w/ trace sand & organics Moist.
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	No	
Metals	(1) 4oz Jar	No	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: X045S004F0024
Sample Location: X045B004
Sampled By: SC
C.O.C. No.: 27421

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/18/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1120	0-24"	D. Brown/Tan	Moist, V.F. Fine Sandy Clay
Method: ~~HA~~ TS HAND CORE				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD _____ Duplicate ID No.: _____

Signature(s):

Ty Nagel FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

Sample ID No.: XO15S001/0006
Sample Location: XO15B001
Sampled By: TR
C.O.C. No.: 27421

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/18/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: ~~HA~~ (GC) HAND CORE	1140	0-6"	D. Brown	Moist, V.F.-Fine Sandy Clay with organics
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes ✓	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tuy Nguyen

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X04SS001
Sample Location: X04SB001
Sampled By: SC
C.O.C. No.: 27421

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/16/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1145	0-24"	Brown/Tan	Moist, V.F. Sandy Clay
Method: HA (FC) HAND CORE				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ty Royal FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X045S002B006
Sample Location: X045B002
Sampled By: TR
C.O.C. No.: 27421

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/16/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1155	0-6"	Tan/Gray	Moist, V.F-Fine Sandy Clay
Method: HAND CORE				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	✓	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic IED Area (UXO 04)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XOASS002002Y
Sample Location: XO2SB002
Sampled By: SBC
C.O.C. No.: 27421

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-18-10	1200	0-24"	light brn/dark brn	Clayey silt w/ some sand and organics. Slightly moist.
Method:				
Hand Core				
Monitor Readings				
(Range in ppm):				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCs (1 vial w/methanol and 2 vials w/ DI water)	(3) 40ml VOA Vials	Yes	
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	No	
Metals	(1) 4oz Jar	No	
pH, CEC and TOC	(1) 8oz Jar	No	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.4

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

APPENDIX F.5

SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 05

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27363 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112600810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANNA ANALYTICAL LAB SER. / MILLIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Royal		T. ROLAHN	(412) 921-8857	34 Dogwood LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FEDEX AB## 8631 2526 4000		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: Explosives / Initials / Zip Lock Bags	COMMENTS
										R / 4°C		
1/23	0840	X05SS0030006	SB 003	0	0.5	SO	C	1	1			
1/23	0850	X05SS0030024	↓	0	2	SO	C	1	1			RUN MS/MSD
1/23	0935	X05SS0040006	SB 004	0	0.5	SO	C	1	1			
1/23	0940	X05SS0040024	↓	0	2	SO	C	1	1			RUN MS/MSD
1/23	1005	X05SS0120006	SB 012	0	0.5	SO	C	1	1			
1/23	1000	X05SS0120024	↓	0	2	SO	C	1	1			
1/23	1018	X05SS0160006	SB 016	0	0.5	SO	C	1	1			
1/23	1023	X05SS0160024	↓	0	2	SO	C	1	1			
1/23	1038	X05SS0230006	SB 023	0	0.5	SO	C	1	1			
1/23	1040	X05SS0230024	↓	0	2	SO	C	1	1			
1/23	1050	X05SS0220006	SB 022	0	0.5	SO	C	1	1			
1/23	1055	X05SS0220024	↓	0	2	SO	C	1	1			
1/23	1113	X05SS0050006	SB 005	0	0.5	SO	C	1	1			

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Royal	1-25-10	1900	1. RECEIVED BY FEDERAL EXPRESS	1-25-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27364 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL ENB SERV / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Tony Kozik		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX 48 # 9631 2526 4000		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES / METALS ZIP LOCK BAGS								COMMENTS
									P	4°C									
1/23	1115	X05SS0050024	SB 005	0	2	SO	C	1	1										
1/23	1128	X05SS0060006	SB 006	0	0.5	SO	C	1	1										
1/23	1130	X05SS0060024	↓	0	2	SO	C	1	1										
1/23	1142	X05SS0010006	SB 001	0	0.5	SO	C	1	1										
1/23	1147	X05SS0010024	↓	0	2	SO	C	1	1										
1/23	1309	X05SS0070006	SB 007	0	0.5	SO	C	1	1										
1/23	1306	X05SS0070024	↓	0	2	SO	C	1	1										
1/23	1315	X05SS0080006	SB 008	0	0.5	SO	C	1	1										
1/23	1317	X05SS0080024	↓	0	2	SO	C	1	1										
1/23	1335	X05SS0250006	SB 025	0	0.5	SO	C	1	1										
1/23	1337	X05SS0250024	↓	0	2	SO	C	1	1										
TR 1/23	1345	X05SS0020006	SB 002	0	0.5	SO	C	1	1										
TR 1/23	1350	X05SS0020024	↓	0	2	SO	C	1	1										

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Tony Kozik	1-25-10	1900	1. RECEIVED BY: FEDERAL EXPRESS	1-25-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27365 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
116G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Agnel		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB # 8631 2526 4000		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES / METALS ZIP LOCK BAGS	COMMENTS
									A	4°C		
1/23	1350	X05SS0240006	SB 024	0	0.5	SO	C	1	1			
1/23	1355	X05SS0240024	↓	0	2	SO	C	1	1			
1/23	1410	X05SS0170006	SB 017	0	0.5	SO	C	1	1			
1/23	1415	X05SS0170024	↓	0	2	SO	C	1	1			
1/23	1430	X05SS0130006	SB 013	0	0.5	SO	C	1	1			
1/23	1435	X05SS0130024	↓	0	2	SO	C	1	1			
1/23	1445	X05SS0180006	SB 018	0	0.5	SO	C	1	1			
1/23	1450	X05SS0180024	↓	0	2	SO	C	1	1			
1/23	1505	X05SS0190006	SB 019	0	0.5	SO	C	1	1			
1/23	1510	X05SS0190024	↓	0	2	SO	C	1	1			
1/23	1535	X05SS0200006	SB 020	0	0.5	SO	C	1	1			
1/23	1540	X05SS0200024	↓	0	2	SO	C	1	1			
1/24	0814	X05SS0100006	SB 0	0	0.5	SO	C	1	1			

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Terry Agnel	1-25-10	1900	1. RECEIVED BY FEDERAL EXPRESS	1-25-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27366 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER / ANNA MINKEN
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
Tony Rojahn		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		**CITY, STATE**
		FED EX AB # 8631 2526 4000		MIDDLETOWN, ~~MD~~ PA (PA)

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☒ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	A	B	C	D	PRESERVATIVE USED				TYPE OF ANALYSIS	COMMENTS
														4°C	4°C/HNO3	4°C	4°C		
														Explosives/ Metals Zip Lock Bags	Metals 500ml HDPE	Explosives 1L Glass Amber	PH, VOC etc 8oz Jar		
1/24	0815	X05550100024	SB 010	0	2	So	C	1	1										
1/24	0850	X05550090006	SB 009	0	0.5	So	C	1	1										
1/24	0855	X05550090024	↓	0	2	So	C	1	1										
1/24	0910	X05550110006	SB 011	0	0.5	So	C	1	1										
1/24	0915	X05550110024	↓	0	2	So	C	2	2	-	-	1							
1/24	0925	X05550140006	SB 014	0	0.5	So	C	1	1										
1/24	0928	X05550140024	↓	0	2	So	C	1	1										RUN MS/MSD
1/24	0948	X05550150006	SB 015	0	0.5	So	C	1	1										
1/24	0955	X05550150024	↓	0	2	So	C	1	1										
1/24	0956	X05550210006	SB 021	0	0.5	So	C	1	1										
1/24	0955	X05550210024	↓	0	2	So	C	1	1										
1/24	0740	RB012410-01	QC	—	-	QC	G	3	~~4~~ 3	2	1	2							
1/24	0745	WB012410-01	QC	—	—	QC	G	1	1		1								

1. RELINQUISHED BY Tony Rojahn	DATE 1-25-10	TIME 1800	1. RECEIVED BY FEDERAL EXPRESS	DATE 1-25-10	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27367 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112400810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Taylor		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB # 8631 2526 4000		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES / METALS ZIP LOCK BAGS	COMMENTS
									P	A		
1/23	0000	FD012310-01	QC	-	-	SO	C	1	1			
1/23	0000	FD012310-02	QC	-	-	SO	C	1	1			
1/24	0000	FD012410-01	QC	-	-	SO	C	1	1			

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Taylor	1-25-10	1900	1. RECEIVED BY FEDERAL EXPRESS	1-25-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27393 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412) 921-8508
LABORATORY NAME AND CONTACT: ANALYTICAL LABS SER: / ANNA MILLKEN			
SAMPLERS (SIGNATURE): Ellen Berkbiter	FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8857	ADDRESS: 34 DOGWOOD LANE
CARRIER/WAYBILL NUMBER: FED EX AB# 8631 2526 7719			CITY, STATE: MIDDLETOWN, PA

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)								COMMENTS
		ADVANCED IED AREA (UXO 05)							G	G	G	Q					
									PRESERVATIVE USED		4°C	4°C	4°C	4°C/HNO3			
									TYPE OF ANALYSIS		EXPLOSIVES 8oz JAR	METALS 4oz JAR	EXPLOSIVES 1L AMBER GLASS	METALS 500-250ml HDPE			
3/14	0900	RB031410-01	QC	-	-	AQ	G	3	—	—	2	1					
3/14	0950	X05SB022 0204	SB022	2	4	SO	G	2	1	1							
3/14	0955	X05SB022 0406	↓	4	6	SO	G	2	1	1							
3/14	1005	X05SB016 0204	SB016	2	4	SO	G	2	1	1							
3/14	1010	X05SB016 0406	↓	4	6	SO	G	2	1	1							
3/14	1040	X05SB012 0204	SB012	2	4	SO	G	2	1	1							
3/14	1045	X05SB012 0406	↓	4	6	SO	G	2	1	1							
3/14	1120	X05SB023 0204	SB023	2	4	SO	G	2	1	1							RUN MS/MSD
3/14	1125	X05SB023 0406	↓	4	6	SO	G	2	1	1							
3/14	1310	X05SB003 0204	SB003	2	4	SO	G	2	1	1							
3/14	1315	X05SB003 0406	↓	4	6	SO	G	2	1	1							
3/14	1340	X05SB004 0204	SB004	2	4	SO	G	2	1	1							
3/14	1345	X05SB004 0406	↓	4	6	SO	G	2	1	1							

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Tony Rojahn	3-15-10	1900	1. RECEIVED BY: FEDERAL EXPRESS	3-15-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27394 | PAGE 1 OF 1

PROJECT NO: CTO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112600910 423	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Ellen Burkhardt		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX AB # 8631 2526 7719		MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID: ADVANCED IED AREA (UXO 05)	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
									PRESERVATIVE USED		4°C	4°C						
									TYPE OF ANALYSIS		EXPLOSIVES 8oz JAR	METALS 4oz JAR						
3/14	1510	X05SB017 0204	SB 017	2	4	SO	G	2			1	1						
3/14	1515	X05SB017 0406	↓	4	6	SO	G	2			1	1						
3/14	1530	X05SB013 0204	SB 013	2	4	SO	G	2			1	1						
3/14	1535	X05SB013 0406	↓	4	6	SO	G	2			1	1						
3/14	1550	X05SB014 0204	SB 014	2	4	SO	G	2			1	1						
3/14	1555	X05SB014 0406	↓	4	6	SO	G	2			1	1						
3/14	1600	X05SB018 0204	SB 018	2	4	SO	G	2			1	1						
3/14	1610	X05SB018 0406	↓	4	6	SO	G	2			1	1						
3/14	1650	X05SB019 0204	SB 019	2	4	SO	G	2			1	1						
3/14	1655	X05SB019 0406	↓	4	6	SO	G	2			1	1						
3/14	1710	X05SB015 0204	SB 015	2	4	SO	G	2			1	1						
3/14	1715	X05SB015 0406	↓	4	6	SO	G	2			1	1						
3/14	1730	X05SB009 0204	SB 009	2	4	SO	G	2			1	1						

1. RELINQUISHED BY: Tony Rojahn	DATE: 3-15-10	TIME: 1900	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 3-15-10	TIME: 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27395 | PAGE 1 OF 1

PROJECT NO: CTO 112G00810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANNA MILLKEN / ANALYTICAL LAB SER
SAMPLERS (SIGNATURE) Ellen Berkbite		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED. EX AB # 8631 2526 7719		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
		ADVANCED IED AREA (UXO 05)							G	G								
									PRESERVATIVE USED									
									4°C	4°C								
									TYPE OF ANALYSIS									
									EXPLOSIVES 8oz JAR	METALS 4oz JAR								
3/14	1735	X05SB009 0406	SB 009	4	6	SO	G	2	1	1								
3/14	0000	FD031410-02	QC	–	–	SO	G	2	1	1								FROM X05SB022 0204
3/15	0900	X05SB010 0204	SB 010	2	4	SO	G	2	1	1								
3/15	0905	X05SB010 0406	↓	4	6	SO	G	2	1	1								
3/15	0915	X05SB011 0204	SB 011	2	4	SO	G	2	1	1								
3/15	0920	X05SB011 0406	↓	4	6	SO	G	2	1	1								
3/15	0925	X05SB021 0204	SB 021	2	4	SO	G	2	1	1								
3/15	0930	X05SB021 0406	↓	4	6	SO	G	2	1	1								
3/15	0940	X05SB006 0204	SB 006	2	4	SO	G	2	1	1								
3/15	0945	X05SB006 0406	↓	4	6	SO	G	2	1	1								
3/15	1000	X05SB020 0204	SB 020	2	4	SO	G	2	1	1								
3/15	1005	X05SB020 0406	↓	4	6	SO	G	2	1	1								
3/15	1030	X05SB001 0204	SB 001	2	4	SO	G	2	1	1								

1. RELINQUISHED BY Tony Rojahn	DATE 3/15/10	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 3/15/10	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27401 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412) 921-8308
LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLKEN	SAMPLERS (SIGNATURE): Ellen Berklite	FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8857
ADDRESS: 34 DOGWOOD LANE	CARRIER/WAYBILL NUMBER: FED. EX AB # 8631 2526 7719	CITY, STATE: MIDDLETOWN PA	

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
		TYPE OF ANALYSIS							EXPLOSIVES 8 oz JAR	METALS 4 oz JAR	PH, CEC & TOC 8 oz JAR							
		PRESERVATIVE USED							4°C	4°C	4°C							
3/15	1035	X05SB001 0406	SB 001	4	6	SO	G	2	1	1								RUN MS/MSD
3/15	1045	X05SB005 0204	SB 005	2	4	SO	G	2	1	1								
3/15	1050	X05SB005 0406	↓	4	6	SO	G	2	1	1								
3/15	1165	X05SB008 0204	SB 008	2	4	SO	G	2	1	1								
3/15	1110	X05SB008 0406	↓	4	6	SO	G	2	1	1								
3/15	1135	X05SB007 0204	SB 007	2	4	SO	G	2	1	1								
3/15	1140	X05SB007 0406	↓	4	6	SO	G	2	1	1								
3/15	1150	X05SB002 0204	SB 002	2	4	SO	G	3	1	1	1							
3/15	1155	X05SB002 0406	↓	4	6	SO	G	3	1	1	1							
3/15	1305	X05SB025 0204	SB 025	2	4	SO	G	2	1	1								
3/15	1310	X05SB025 0406	↓	4	6	SO	G	2	1	1								
3/15	1325	X05SB024 0204	SB 024	2	4	SO	G	2	1	1								RUN MS/MSD
3/15	1330	X05SB024 0406	↓	4	6	SO	G	2	1	1								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Tony Rojahn	3-15-10	1900	1. RECEIVED BY: FEDERAL EXPRESS	3-15-10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27403 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308
SAMPLERS (SIGNATURE) Ellen Berkhite		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857
		CARRIER/WAYBILL NUMBER FED EX AB # 8631 2526 7719	CITY, STATE MIDDLETOWN PA

LABORATORY NAME AND CONTACT: ANVA MILLKEN
ADDRESS 34 DOGWOOD LANE

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G
PRESERVATIVE USED: 4°C 4°C

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES 8021 JAR	METALS 6020 JAR	COMMENTS
3/15	0000	FD031510-01	QC	-	-	SO	G	2	1	1	FROM X05580060204
3/15	0000	FD031510-02	QC	-	-	SO	G	2	1	1	X05580250406

1. RELINQUISHED BY Terry Royal	DATE 3-15-10	TIME 1900	1. RECEIVED BY FEDERAL EXPRESS	DATE 3-15-10	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Page___ of ___

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: WB012410-01
Sampled By: T. RAJAHN
C.O.C. Number: 27366

[] Trip Blank
[■] Source Water Blank
[] Rinsate Blank
[] Other Blank ____

SAMPLING DATA:

Date: 1-24-10
Time: 0745
Method: Direct Pour into Bottle

WATER SOURCE:

[] Laboratory Prepared
[■] Purchased
[] Other ____
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENG
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: NA
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Volatiles (for soil)	Cool 4°C	1 vial w/methanol and 2 vials w/ DI	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	YES / (NO)
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) / NO
			~~YES / NO~~

OBSERVATIONS / NOTES:

Signature(s):

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB012410-01
Sampled By: T. ROJAHN
C.O.C. Number: 27366

[] Trip Blank
[] Source Water Blank
[X] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 1-24-10
Time: 0740
Method: POUR OVER HAND CORER

WATER SOURCE:

[] Laboratory Prepared
[X] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENV
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: Soil
Equipment Used: HAND CORER
Equipment Type:
[] Dedicated
[X] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Volatiles (for soil)	Cool 4°C	1 vial w/methanol and 2 vials w/ DI	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) NO
			~~YES / NO~~

OBSERVATIONS / NOTES:

Signature(s):

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031410-01
Sampled By: T. ROJAHN
C.O.C. Number: 27393

[] Trip Blank
[] Source Water Blank
[x] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-14-10
Time: 0900
Method: Pour through SLEEVE

WATER SOURCE:

[] Laboratory Prepared
[x] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENV.
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: Soil
Equipment Used: DPT SAMPLE SLEEVE
Equipment Type:
[x] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) / NO
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES (NO)

OBSERVATIONS / NOTES:

Signature(s):

Ted Vogel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055C0030006
Sample Location: X055B003
Sampled By: J Birkett
C.O.C. No.: 27363

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	0840	0-6"	Brown to light brown	clay some silt and F sand fr organics moist to wet (roots)
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)
Project No.: 112G00810, CTO 423

Sample ID No.: X05SS0030024
Sample Location: X05SB003
Sampled By: J Birkett
C.O.C. No.: 27363

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	0850	0-24	Brown	silty clay tr. F-M sand and small gravel
Method:				wet
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD yes

Duplicate ID No.: FD-012310-01

Signature(s):

Jarad Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)
Project No.: 112G00810, CTO 423

Sample ID No.: X055B40006
Sample Location: X055B04
Sampled By: J Birkett
C.O.C. No.: 27363

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	0935	0-6"	Brown	silty clay some F. organics to sand
Method: Hand corer				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

TA

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s):

J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X05S5004 0024
Sample Location: X05SB004
Sampled By: J Birkett
C.O.C. No.: 27363

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	0940	0-24	Brown	clay some silt tr sand and organics
Method: Hand core				moist (roots)
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
Yes	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055s012o024
Sample Location: X055B012
Sampled By: T. Rojahn
C.O.C. No.: 27363

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1000	0-24"	Brown	clay some silt tr. F-M sand
Method: Hand core				moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Sample ID No.: X055S012000C
Sample Location: X055B012
Sampled By: J Birkett
C.O.C. No.: 27363

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1005	0-6"	Brown	clay some silt tr F-M sand and organics
Method: Hand core				moist to wet (roots, sticks)
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

~~[X]~~ Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X055S0160006
Sample Location: X055B016
Sampled By: J Birkett
C.O.C. No.: 27363

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1018	0-6"	Brown	clay some silt and Fine organics
Method: Hand Core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s): Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S016 0024
Sample Location: X055B016
Sampled By: T. Rojahn
C.O.C. No.: 27363

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-16	1023	0-24"	Dk brown to brown	clayey silt tr. F-M sand and organics
Method: Hand core				moist (roots, sticks)
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)
Project No.: 112G00810, CTO 423

Sample ID No.: X055S023000G
Sample Location: X055B023
Sampled By: J Birkett
C.O.C. No.: 27363

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1038	0-6"	Dk brown to brown	clayey silt some F sand and organics
Method: Hand core				moist (roots, sticks)
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: _____

Signature(s): J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S0230024
Sample Location: X055B023
Sampled By: T. Rajahn
C.O.C. No.: 27363

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1040	0-24"	Brown	clayey silt tr sand
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05550220006
Sample Location: X055B022
Sampled By: J Birkett
C.O.C. No.: 27363

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1050	0-6"	Brown	clay some silt and fine organics
Method: Hand core				tr. F-M sand and F gravel
				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X05550220024
Sample Location: X055B022
Sampled By: T. Rojahn
C.O.C. No.: 27363

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1055	0-24	Brown	silty clay fr. F-M sand and organics
Method:				moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO5S5B50006
Sample Location: XO5SB05
Sampled By: J Birkett
C.O.C. No.: 27363

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 1-23-10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: Hand core	1113	0-6"	Brown	clayey silt some M sand and roots
Monitor Readings (Range in ppm): NA				very wet

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jason Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

~~[X]~~ Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X055S005 0024
Sample Location: X055B005
Sampled By: T. Rojahn
C.O.C. No.: 27364

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1115	0-24	Brown	clayey silt fr. sand and organics
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)
Project No.: 112G00810, CTO 423

Sample ID No.: X055S0060006
Sample Location: X055B3006
Sampled By: J Birkett
C.O.C. No.: 27364

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1128	0-6"	Brown	clayey silt some F sand tr small gravel and
Method:				fine organics
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: _____

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S00600 24
Sample Location: X055B006
Sampled By: T. Rojahn
C.O.C. No.: 27364

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1130	0-24	brown	silt some clay tr. sand
Method:				(roots) Moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S0010006
Sample Location: X055B001
Sampled By: J Birkett
C.O.C. No.: 27364

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1142	0-6"	Brown	silty clay tr. F-M sand and organics
Method:				(roots, leaves, sticks) moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-012310-02

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S0010024
Sample Location: X055B001
Sampled By: T. Rojahn
C.O.C. No.: 27364

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1147	~~0-~~ JBB		
Method:		0-24"	Brown	clay some silt fr. F-M sand
Hard core				moist
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: XOSS50020006
Sample Location: XOSSB002
Sampled By: J Birkett
C.O.C. No.: 27364

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1345	0-6"	Dark brown	silt some F Sand and Fine organics
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05550020024
Sample Location: X05513002
Sampled By: JBirkett
C.O.C. No.: 27364

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1250	0-24	Brown	clayey silt tr F sand
Method: Hand core				(roots, sticks) moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jacob Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055507 0024
Sample Location: X055507
Sampled By: J Birkett
C.O.C. No.: 27364

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1306	0-24"	Brown to light brown	silty clay some F sand
Method: Hand corr				moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X0555007 0006
Sample Location: X055B007
Sampled By: T. Rojahn
C.O.C. No.: 27364

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1309	0-6"	Brown	silty clay tr. F sand wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S008O006
Sample Location: X055B008
Sampled By: T. Rajahn
C.O.C. No.: 27364

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1315	0-6"	Brown	clayey silt some small gravel and F sand wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	~	
Metals	(1) 4oz Jar	~	
pH, CEC and TOC	(1) 8oz Jar	~	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X05550080024
Sample Location: X0555008
Sampled By: J Birket
C.O.C. No.: 27364

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1317	0-24"	Brown	silty clay some F-M sand tr small gravel wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S025 0006
Sample Location: X055B025
Sampled By: T. Rojahn
C.O.C. No.: 27364

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1335	0-6"	Dark brown	organic rich soil some F sand
Method: Hand core				(roots, sticks) moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X055S0250024
Sample Location: X055B025
Sampled By: J Birkett
C.O.C. No.: 27364

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1337	0-24"	Light Brown to brown	clayey silt some F sand tr gravel
Method: Hand core				wet to moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X0555024 0006
Sample Location: X0555024
Sampled By: T. Rajahn
C.O.C. No.: 27365

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1350	0-6"	Dk brown to brown	clayey silt some Fine organics and F sand
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055502400 24
Sample Location: X055B024
Sampled By: J Birkett
C.O.C. No.: 27365

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1355	0-24"	Pk brown to light brown	clayey silt some F sand moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S017O006
Sample Location: X055B017
Sampled By: T. Rojahn
C.O.C. No.: 27367

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1410	0-6"	Brown to dark brown	silty clay some F-M sand and Fine organics
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X055S017O024
Sample Location: X055B017
Sampled By: J Birkett
C.O.C. No.: 27365

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1415	0-24"	Brown	silty clay some F sand
Method: Hand core				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X05550130006
Sample Location: X0558013
Sampled By: T. Rojahn
C.O.C. No.: 27365

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1430	0-6"	Brown	silt some F sand and fine organics
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055501300 24
Sample Location: X055B013
Sampled By: J Birkett
C.O.C. No.: 27365

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1435	0-24"	Brown	silty clay tr F sand
Method: Hand core				moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X055501B0006
Sample Location: X055B018
Sampled By: T. Rojahn
C.O.C. No.: 27365

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1445	0-6"	Brown	F-M sand some silt tr gravel moist to wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: XO55S018 0024
Sample Location: XO55B018
Sampled By: T. Rojahn
C.O.C. No.: 27365

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1450	0-24"	Brown to red/brown/	silty F sand some gravel
Method:			gray	silty clay
Hand core			mottled	moist
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

silty clay encountered around 1.5' bgs

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S190006
Sample Location: X055B019
Sampled By: T. Rojahn
C.O.C. No.: 27365

~~[X]~~ Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	1505	~~0-24 SBD~~	Brown	gravely clay some F-M sand
Method:		0-6"		wet
Hand corr				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S190024
Sample Location: X055B19
Sampled By: J Birkett
C.O.C. No.: 27365

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1510	0-24"	Brown	F-M sand some Fine to Coarse gravel tr. clay
Method: Hand core				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X055S0200006
Sample Location: X055B020
Sampled By: T. Rojahn
C.O.C. No.: 27365

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1535	0-6"	Brown	silty clay some F gravel and F-C sand moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X055S020 0024
Sample Location: X055B020
Sampled By: J Birkett
C.O.C. No.: 27365

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-23-10	1540	0-24"	Brown	clayey silt some F sand tr gravel (angular and rounded) moist to wet
Method: Hand auger and Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XOS55010000G
Sample Location: XO55B010
Sampled By: J Birkett
C.O.C. No.: 27365

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0814	0-6"	Brown to light brown	clayey silt some F sand tr. gravel (rounded)
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	~	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Jarrod Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055S010024
Sample Location: X055B010
Sampled By: T. Rojahn
C.O.C. No.: 27386

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0815	0-24"	Brown to Black	Gravely (slag) F-M sand some clay
Method: Hand auger and Hand core				Moist
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: XO55500900006
Sample Location: XO55B009
Sampled By: J Birkett
C.O.C. No.: 27366

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0850	0-6"	Dk brown to brown	Clayey F-M sand some F-M gravel
Method: Hand Core				moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jarrett Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
~~EOD School Demolition Area (UXO 28)~~
Project No.: 112G00810, CTO 423 Advanced IED Area (UXO 05)

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Sample ID No.: X055S0090024
Sample Location: X055B009
Sampled By: T. Rojaha
C.O.C. No.: 22366

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0855	~~Black/DK Brown~~ SED w/gravel 0-24	Black/DK brown	F sand some gravel moist (First few inches)
Method: Hand auger				Gravel (slag) some F-M sand
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

Gravel (slag) - road material

MAP:

185
SEE FIGURE ~~18.3~~

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X0555011 0006
Sample Location: X0551011
Sampled By: T. Rojahn
C.O.C. No.: 27366

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0910	0-6"	Brown to light brown	clayey silt some F sand tr gravel (rounded) moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex ~~EOD School Demolition Area (UXO 28)~~

Project No.: 112G00810, CTO 423 Advanced IED Area (UXO 05)

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Sample ID No.: X055501l0024
Sample Location: X055B011
Sampled By: T. Rojahn
C.O.C. No.: 27366

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0915	0-24"	Brown to Black to	silty sand some gravel tr. clay (moist)
Method: Hand core			Gray/Light Brown mottled	silty clay
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

silty clay encountered ~1.5' bgs

MAP:

SEE FIGURE 18.5 ~~18.3~~

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Jared Rabbitt

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X055501400O6
Sample Location: X055B014
Sampled By: J Birkett
C.O.C. No.: 27366

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 1-24-10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: Hand core	0925	0-6"	Brown	F sand some clay tr gravel (rounded) moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
~~EOD School Demolition Area (UXO 28)~~
Project No.: 112G00810, CTO 423
Advanced IED Area (UXO 05)

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Sample ID No.: X055S0140024
Sample Location: X055B014
Sampled By: J Birkett
C.O.C. No.: 27366

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0928	0-24"	Brown to light brown	clayey F-M gravel tr F sand moist
Method: Hand auger and Hand core			to mottled gray/light brown	clay (moist)
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

clay encountered around 1.5' bgs
gravel is round and clean (not slag type material)

MAP:

18.5
SEE FIGURE ~~18.3~~

Circle if Applicable:

MS/MSD yes

Duplicate ID No.: —

Signature(s):

Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X055501500006
Sample Location: X055B015
Sampled By: J Birkett
C.O.C. No.: 27366

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0948	0-6"	Brown	gravely F-C sand tr. silt
Method:				moist to wet
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar		
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)
Project No.: 112G00810, CTO 423

Sample ID No.: X055S0150024
Sample Location: X055B015
Sampled By: J Birkett
C.O.C. No.: 27366

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0955	0-24"	Dk brown to brown	F sand some gravel (rounded) tr clay
Method: Hand auger and Hand core				
Monitor Readings				
(Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
Explosives	(1) 8oz Jar	—	
Metals	(1) 4oz Jar	—	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
~~EOD School Demolition Area (UXO 28)~~

Project No.: 112G00810, CTO 423
Advanced IED Area (UXO05)

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X055S0210006
Sample Location: X055B021
Sampled By: T. Rajahn
C.O.C. No.: 27366

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 1-24-10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: Hand auger and Hand core	0956	0-6"	Light Brown to Dark Brown	clayey F sand some F-M gravel moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE ~~18.3~~ 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-012410-01

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex ~~EOD School Demolition Area (UXO 28)~~

Project No.: 112G00810, CTO 423 Advanced IED Area (UXO05)

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X055502/0024
Sample Location: X055B021
Sampled By: T. Rojahn
C.O.C. No.: 27386

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-24-10	0955	0-24	Dark Brown to brown	F-M sand some clay tr small gravel moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE ~~18.3~~ 18,5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jud Baker

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB022004
Sample Location: X05SB022
Sampled By: EB
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0950	24'	Rust/Tan	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

Field Duplicate

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD031410Q

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Sample ID No.: ~~X05SB022040~~
Sample Location: X05SB022
Sampled By: EB
C.O.C. No.: 27393

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0955	4-6'	Rust	~~Moist~~, V.F.-Fine Clayey Sand wet with pebbles
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

- [] Surface Soil
- [X] ~~Subsurface Soil~~
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X05SB016204
Sample Location: X05SB016
Sampled By: EB
C.O.C. No.: 27393

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/04	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1005	2-4'	Rust/Tan/Gray	Moist, V.F.-Fine ~~clayey Sand~~ Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB016-0406
Sample Location: X05SB016
Sampled By: ER
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1010	4-6'	Rust/Brown/Gray	Moist, U.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Burkhite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X055B12029
Sample Location: X055B12
Sampled By: EB
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1040	2-4'	Rust/Tan	Moist, V.F-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD _____ Duplicate ID No.: _____

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB12046
Sample Location: X05SB12
Sampled By: EB
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1045	4-6'	Rust/Tan	Moist, V.F.-Fine Sandy Clay (4-5') Wet, V.F.-Fine Clayey Sand (5-6') with Pebbles
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkebile

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB023024
Sample Location: X05SB023
Sampled By: ER
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1120	2-4'	Rust/Brown/Gray	Moist, V.F-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s):

Ellen Berkbite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB023046
Sample Location: X05SB023
Sampled By: EB
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1125	4-6'	Rust/Brown/Tan	Moist, V.F.-Fine Sandy Clay (4-5') wet, V.F.-Fine Clay/Sand (5-6') with pebbles
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB03004
Sample Location: X05SB03
Sampled By: EB
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1310	2-4	Rust/tan	Moist, V.F.-Fine Sandy clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date: N/A	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkhte

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: XA05SB003 0406
Sample Location: XA05SB03
Sampled By: ER
C.O.C. No.: 27393

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1315	4-6'	Rust/Tan	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkbite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB004-0204
Sample Location: X05SB004
Sampled By: EB
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1340	2-4'	Tan	Moist, V.F.- Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	[redacted]			
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berfette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB004-0406
Sample Location: X05SB004
Sampled By: ER
C.O.C. No.: 27393

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1345	4-6'	Tan/Gray	M/St, V.F.-Fine Sandy Clay Hard Gray Clay (5-6')
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkeley

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X055B017024
Sample Location: X055B017
Sampled By: EB
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1510	24'	Rust Brown	Moist, Fine-V.F. Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] ~~Subsurface Soil~~
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB017040
Sample Location: X05SB017
Sampled By: EB
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1515	4-6'	Rust Brown	~~Moist~~ wet, V.F. Fine clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB013204
Sample Location: X05SB013
Sampled By: EB
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/4/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1530	24'	Tan	Moist, V.F-Fine Sandy Clay
Method: OPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X05SB013006
Sample Location: X05SB013
Sampled By: EB
C.O.C. No.: 27394

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1535	4-6'	Tan	Moist, V.F.-Fine Sandy Clay (4-5') Saturated, V.F-Fine Clayey Sand (5-6')
Method: PPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
~	—

Signature(s): Ellen Berkite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] ~~Subsurface Soil~~
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XA05SB014-0204
Sample Location: XA05SB014
Sampled By: ER
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1550	2-4'	Tan	Moist, V.F. Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkbigler

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] ~~Subsurface Soil~~
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB014-0406
Sample Location: X05SB014
Sampled By: EB
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1555	4-6'	Tan	Moist, VF-Fine Sandy Clay (4-5')
Method: DPT			Wet, Fine-Med. Clayey Sand (5-6') with pebbles
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB018020204
Sample Location: X05SB018
Sampled By: ER
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/4/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1600	24	Tan	Moist, VF. Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO5SB018046
Sample Location: XO5SB018
Sampled By: ER
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1610	4-6'	Tan	Wet, V.F.-Fine Sandy Clay
Method: DPT			~~Wet~~ V.F.-Fine Clayey Sand
Monitor Reading (ppm): —			Saturated with pebbles

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkete

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XBSB019024
Sample Location: XBSB019
Sampled By: ER
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1650	2-4'	Tan	Moist, V.F.- Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkhite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X055B019046
Sample Location: X055B019
Sampled By: EB
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1655	46'	Tan	Moist, V.F-Fine Sandy Clay
Method: DPT			saturated, V.F-Fine Clay Sand w/pebbles
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Rebillot

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB015024
Sample Location: X05SB015
Sampled By: EB
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1710	24'	Tan/Rust	Moist, V. Fine ~~Fine~~ Sandy Clay
Method: bPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkstite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO5SB0150406
Sample Location: XO5SB05
Sampled By: ER
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1715	4-6'	Tan/Rust	Moist/wet, V.F-Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkeley

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB009024
Sample Location: X05SB009
Sampled By: ER
C.O.C. No.: 27394

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/14/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1730	24'	Gray/Tan	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

- [] Surface Soil
- ~~[]~~ Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X05SB009046
Sample Location: X05SB009
Sampled By: ER
C.O.C. No.: 27395

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 3/14/10	4-6'	Gray/Tan	Moist, V.F.-Fine Sandy Clay (4-5)
Time: 1735			Moist Hard Clay (5-6')
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB010204
Sample Location: X05SB010
Sampled By: EB
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0900	2-4	Rust/Brown/Tan	Moist, V.F-Fine sandy clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X05SB010046
Sample Location: X05SB010
Sampled By: FR
C.O.C. No.: 27395

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0905	4-6	Rusty Brown/ Tan	~~Saturated~~ Dark U.G. Fine clayey Sand MOIST, Hard gray clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkheiser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] ~~Subsurface Soil~~
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB011004
Sample Location: X05SB011
Sampled By: ER
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0915	~~4-6~~ 2-4'	Tan/ Rust	Moist, V.F-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Ellen Berkelote

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] ~~Subsurface~~ Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB01104O6
Sample Location: X05SB01
Sampled By: EB
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 3/15/10			
Time: 0920			
Method: DPT	4-6'	Gray	Moist Hard Clay
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO5SB021024
Sample Location: XO5SB021
Sampled By: EB
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0925	2-4	Rust/Tan	VF, Fine clayey Sand (moist)
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkstite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] ~~Subsurface Soil~~
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB021006
Sample Location: X05SB021
Sampled By: EB
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0930	4-6'	Rust/Tan	V. Fine-Fine clay Sand (45) Moist
Method: HA		Gray	Saturated V.F.F. Sandy Clay (5-6')
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkbite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XO5SB006-0004
Sample Location: XO5SB006
Sampled By: ER
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0940	24'	Rust/Tan	Moist, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

* Duplicate

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.: FD031510-01

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB06-0406
Sample Location: X05SB06
Sampled By: EB
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/16	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0945	~~2-4~~ 4-6'	Rust/tan	Moist, V.F. Fine Clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XX5B020024
Sample Location: XX5B020
Sampled By: EB
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/16	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1000	24'	Rust/tan	Moist, V.F.-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkte

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB020046
Sample Location: X05SB020
Sampled By: ER
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10 Time: 1005 Method: HA Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	4-6'	Rust/Tan Gray	Moist, V.F.-Fine Sandy Clay saturated at 5.5' (Hard Clay)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: _____

Signature(s):

Ellen Berkstite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB001024
Sample Location: X05SB001
Sampled By: EB
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10 Time: 1030 Method: DPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	2-4'	Rust/tan	Moist, V.F. ~~Fine~~ Sandy Clay

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: ~~SB01-~~XO5SB01GA06
Sample Location: XO5 SB01
Sampled By: EB
C.O.C. No.: 27401

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1035	4-6'	Rust/Tan	Moist, V.F.-Fine clayey Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berlette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB005Q204
Sample Location: X05SB005
Sampled By: EB
C.O.C. No.: 27401

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1045	24	Rust/Tan	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): Ellen Berkhite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB005-0406
Sample Location: X05SB005
Sampled By: EB
C.O.C. No.: 27401

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1050	~~2-4~~ 4-6	Rust/tan	Moist, V.F.-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X05SB008020F
Sample Location: X05SB008
Sampled By: EB
C.O.C. No.: 274 01

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1105	2-4'	Rust/Tan	Moist, Vf-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkstite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB008040G
Sample Location: X05SB008
Sampled By: ER
C.O.C. No.: 27401

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1410	4-6'	Rust/tan	Wet, V.F.-Fine Sandy clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Ellen Barbetta

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)
Project No.: 112G00810, CTO 423

Sample ID No.: XO5SB007Q04
Sample Location: XO5SB007
Sampled By: EB
C.O.C. No.: 27401

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1135	24'	Rust/Tan	Moist, V.F.-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X05SB007040G
Sample Location: X05SB007
Sampled By: EB
C.O.C. No.: 27401

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1140	4-6'	Rust/Tan	Moist, V.F-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB002021
Sample Location: X05SB002
Sampled By: EB
C.O.C. No.: 27401

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1150	24'	Rust/Tan	Moist, ~~Clay~~ VF. Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

pH, CEC, + TOC

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X05SB0820406
Sample Location: X05SB02
Sampled By: EB
C.O.C. No.: 27401

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1155	4-6'	Rust/Tan	Moist, V.F.-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

pH, CEC + TOC

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X05SB025020-04
Sample Location: X05SB025
Sampled By: EB
C.O.C. No.: 27401

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 3/15/10 1305	2-4'	Rust/tan	Moist, VF-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar		
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

~~*Duplicate~~

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	~~EB031510-02~~ —

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

Sample ID No.: X05SB025040G
Sample Location: X05SB025
Sampled By: EB
C.O.C. No.: 27401

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1310	4-6'	Rust/tan	Moist, V.F.-Fine Sandy Clay
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~ ✓	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

* Duplicate

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD031510-02

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: XO5SB024-02
Sample Location: XO5SB024
Sampled By: ER
C.O.C. No.: 27401

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1325	2-4	Rust	Moist V.F-Med. Clayey Sand w/ pebbles stones - Fill Material
Method: HA			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MS/MSD

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s):

Ellen Berdite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Advanced IED Area (UXO 05)

Project No.: 112G00810, CTO 423

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X05SB024046
Sample Location: X05SB024
Sampled By: EB
C.O.C. No.: 27401

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/15/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1330	4-6	Rust	Moist, V.F-Med. clayey Sand w/pebbles - Fill Material stones
Method: HA			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	~~Yes~~	
Explosives	(1) 8oz Jar	✓	
Metals	(1) 4oz Jar	✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

~~* MS/MSD 3.~~
~~Blue glove~~

TC NO

MAP:

SEE FIGURE 18.5

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkate

APPENDIX F.6

SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 10

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27368 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA M. IIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX. AB# 8631 2526 3996		MIDDLETOWN, PA

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)										COMMENTS
									PRESERVATIVE USED										
									TYPE OF ANALYSIS	EXPLOSIVES ZIP LOCK BAG	EXPLOSIVES 8F2 JAR								
1/25	0856	X10SD0020006	SD 002	0	0.5	SD	G (TP)	1	1										
1/25	0908	X10SD 002 0024	↓	0	2	SD	G (TP)	1	1										
1/25	0930	X10SD 003 0006	SD 003	0	0.5	SD	G (TP)	1	1										
1/25	0950	X10SD003 0024	↓	0	2	SD	C	1	1										
1/25	1540	X10SD010 0006	SD 010	0	0.5	SD	C	1	1										
1/25	1510	X10SD010 0024	↓	0	2	SD	C	1	1										
1/25	1530	X10SD010 0204	↓	2	4	SD	G	1	-	1									
1/26	0842	X10SD001 0006	SD 001	0	0.5	SD	C	1	1										
1/26	0852	X10SD001 0024	↓	0	2	SD	C	1	1										
1/26	0855	X10SD001 0204	↓	2	4	SD	G	1	-	1									
1/26	0904	X10SD001 0405	SD 001	4	5	SD	G	1	-	1									
1/26	0945	X10SD002 0204	SD 002	2	4	SD	G	1	-	1									
1/26	0956	X10SD002 0405	↓	4	5	SD	G	1	-	1									

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	1-27-10	1500	1. RECEIVED BY FEDERAL EXPRESS	1-27-10	1500
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27370 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00910	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		**CITY, STATE**
		FED. EX AB # 8631 2526 3996		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): R G
PRESERVATIVE USED: 4°C 4°C
TYPE OF ANALYSIS: EXPLOSIVES ZIP LOCK BAG; EXPLOSIVES 8oz JAR

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS									COMMENTS
1/26	0956	X105D002 0405	SD 002	4	5	SD	G	1	-	1	FAR		4/24				
1/26	1020	X105D003 0204	SD 003	2	4	SD	G	1	-	1							
1/26	1030	X105D003 0405	↓	4	5	SD	G	1	-	1							
1/26	1100	X105D006 0006	SD 006	0	0.5	SD	C	1	1								
1/26	1110	X105D006 0024		0	2	SD	C	1	1								
1/26	1118	X105D006 0204		2	4	SD	G	1	-	1							
1/26	1145	X105D006 0405	↓	4	5	SD	G	1	-	1							
1/26	1215	X105D005 0006	SD 005	0	0.5	SD	C	1	1								
1/26	1228	X105D005 0024 (TR)		0	2	SD	C	1	1								
1/26	1235	X105D005 0204		2	4	SD	G	1	-	1							
1/26	1245	X105D005 0405	↓	4	5	SD	G	1	-	1							
1/26	1429	X105D004 0006	SD 004	0	0.5	SD	C	1	1								
1/26	1445	X105D004 0024	↓	0	2	SD	C	1	1								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Teny Rojahn	1-27-10	1500	1. RECEIVED BY: FEDERAL EXPRESS	1-27-10	1500
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R-
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27371 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112600810	NSF INDIAN HEAD	R. BASINSKI	(412)921-8308	ANALYTICAL LAB SER / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		T. ROSANNI	(412)921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB# 8631 2526 3996		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)		PRESERVATIVE USED		TYPE OF ANALYSIS							COMMENTS
									P	G	4°C	4°C	EXPLOSIVES ZIPLOCK BAG	EXPLOSIVES 8oz JAR						
1/26	1505	X10SD0040204	SD 004	2	4	SD	G	1	-	1										
1/26	1515	X10SD0040405	↓	4	5	SD	G	1	-	1										
1/26	1545	X10SD0070006	SD 007	0	0.5	SD	C	1	1											
1/26	1555	X10SD0070024		0	2	SD	C	1	1											
1/26	1600	X10SD0070204		2	4	SD	G	1	-	1										
1/26	1610	X10SD0070405	↓	4	5	SD	G	1	-	1										
1/26	0000	FD012610-01	QC	-	-	SD	G	1	-	1										
1/27	0830	X10SD0120006	SD 012	0	0.5	SD	C	1	1											
1/27	0840	X10SD0120024		0	2	SD	C	1	1											
1/27	0843	X10SD0120209		2	4	SD	G	1	-	1										
1/27	0859	X10SD0120405	↓	4	5	SD	G	1	-	1										
1/27	0925	X10SD0110006	SD 011	0	0.5	SD	C	1	1											RUN MS/MSD
1/27	0933	X10SD0110024	↓	0	2	SD	C	1	1											

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	1-27-10	1500	1. RECEIVED BY FEDERAL EXPRESS	1-27-10	1500
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27372 | PAGE 1 OF 1

PROJECT NO: 112G00810	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANNA ANALYTICAL LAB SER. / MILLER
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED. EX AB# 8631 2526 3996		CITY, STATE MIDDLETOWN, PA

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE 2010 YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
									PRESERVATIVE USED									
									TYPE OF ANALYSIS	EXPLOSIVES ZIP LOCK BAG	EXPLOSIVES 8oz JAR							
1/27	0940	X105D011 0204	SD 011	2	4	SD	G	1	—	1								
1/27	0955	X105D011 0405	↓	4	5	SD	G	1	—	1								
1/27	1111	X105D014 0006	SD 014	0	0.5	SD	C	1	1									
1/27	1120	X105D014 0024		0	2	SD	C	1	1									
1/27	1131	X105D014 0204		2	4	SD	G	1	—	1								
1/27	1143	X105D014 0405	↓	4	5	SD	G	1	—	1								

1. RELINQUISHED BY	DATE 1-27-10	TIME 1500	1. RECEIVED BY FEDERAL EXPRESS	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27373 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Tony Rojahn		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FEDEX AB # 8631 2526 3985		MIDDLETOWN, PA 17057

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P | G | G | G
PRESERVATIVE USED: 4°C | 4°C | 4°C | 4°C

TYPE OF ANALYSIS: EXPLOSIVES ZIP LOCK BAGS | EXPLOSIVES 8oz JAR | EXPLOSIVES IL AMBER GLASS | ~~EXPLOSIVES~~ PH, CEC, ETOC 8oz JAR

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS								COMMENTS
2/02	0830	RB020210-01	QC	—	—	AQ	G	2	—	—	2					
~~2/02~~	~~0835~~	~~MB020210-01~~	~~QC~~	~~—~~	~~—~~	~~AQ~~	~~G~~	~~2~~	~~—~~	~~—~~	~~2~~				TR	CANCELED VIA PHWI CALL (not needed)
2/02	0940	X10SD008 0006	SD 008	0	0.5	SD	C	1	1							
2/02	0935	X10SD008 0024	↓	0	2	SD	C	1	1							
2/02	0950	X10SD008 0204		2	4	SD	G	1	—	1						
2/02	0958	X10SD008 0405	↓	4	5	SD	G	1	—	1						
2/02	1110	X10SD009 0006	SD 009	0	0.5	SD	C	1	1							
2/02	1025	X10SD009 0024	↓	0	2	SD	C	1	1							
2/02	1045	X10SD009 0204		2	4	SD	G	1	—	1						
2/02	1055	X10SD009 0405	↓	4	5	SD	G	1	—	1						
2/02	1235	X10SD015 0006	SD 015	0	0.5	SD	C	1	1							
2/02	1228	X10SD015 0024	↓	0	2	SD	C	2	1	—	—	1				
2/02	1240	X10SD015 0204	↓	2	4	SD	G	2	—	2						RUN MS/MSD

1. RELINQUISHED BY: Tony Rojahn	DATE 02/02/10	TIME 1900	1. RECEIVED BY: FEDERAL EXPRESS	DATE 02/02/10	TIME 1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27374 | PAGE ____ OF _____

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / MILLER
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
		T. ROJAHN	(412) 921-8957	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		**CITY, STATE**
		FED. EX AB # 8631 2526 3985		MIDDLETOWN, PA 17057

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									TYPE OF ANALYSIS / PRESERVATIVE USED	COMMENTS
																		EXPLOSIVES ZIP LOCK BAG 4°C	
																		EXPLOSIVES 8oz JAR 4°C	
																		PH, CEC & TOC 8oz JAR 4°C	
2/02	1250	X10SD015 0406	SD 015	4	6	SD	G	1	-	1									
2/02	1302	X10SD013 0006	SD 013	0	0.5	SD	G C (3)	1	1										
2/02	1309	X10SD013 0024		0	2	SD	C	1	1										
2/02	1317	X10SD013 0204		2	4	SD	G	3	-	2	1								RUN MS/MSD
2/02	1335	X10SD013 0405	↓	4	5	SD	G	2	-	1	1								
02/02	0000	FD020210-01	QC	-	-	SD	G	1	-	1									
02/02	0000	FD020210-02	QC	-	-	SD	C	1	1										

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	02/02/10	1830	1. RECEIVED BY FEDERAL EXPRESS	02/02/10	1900
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location:
QA Sample Type:

Sample ID Number: RB020210-01
Sampled By: T. ROJAHN
C.O.C. Number: 27373

[] Trip Blank
[] Source Water Blank
[■] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 2-02-10
Time: 0830
Method: Pour over Hand Auger

WATER SOURCE:

[] Laboratory Prepared
[■] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL
Supplier: Field Env.
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: Soil
Equipment Used: Hand Auger
Equipment Type:
[] Dedicated
[■] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Volatiles (for soil)	Cool 4°C	1 vial w/methanol and 2 vials w/ DI	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES / (NO)
			~~YES / NO~~

OBSERVATIONS / NOTES:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0020006
Sample Location: X10SB002
Sampled By: T. Rajahn
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-25-10	0856	0-6"	Brown	silt/clay and organics (fines and roots)
Method: Hand auger				tr. F sand
				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (X)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X105D0020024
Sample Location: X105B002
Sampled By: T. Rojahn
C.O.C. No.: 27369

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-25-10	0908	0-24	Brown	Fine organics and clay tr. F-sand and roots
Method: Hand Auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD | Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD0030006
Sample Location: X10SB003
Sampled By: T. Rojahn
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-25-10	0930	0-6"	Brown	F. organics and roots some silt/clay
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag ✓	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD00300 24
Sample Location: X10SB003
Sampled By: J Birkett
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 1-25-10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: Hand auger	0950	0-24"	Brown	organics (roots, stalks) some silt and clay wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0100024
Sample Location: X10SB010
Sampled By: T. Rojahn
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-25-10	1510	0-24"	Brown	silt/clay and roots tr. F sand
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0100204
Sample Location: X10SB010
Sampled By: T. Rojahn
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-25-10	1530	2'-4'	Brown	silty clay tr F sand
Method: Hand auger				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD Duplicate ID No.: _____

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD010006
Sample Location: X10SB010
Sampled By: J Birkett
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-25-10	1540	0-6"	Brown	Forganics and roots/stalks some clay
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD — Duplicate ID No.:

Signature(s):

J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0010006
Sample Location: X10SB001
Sampled By: T. Rojahn
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	0842	0-6"	Brown	F. organics and roots some silt/clay wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X105D0010024
Sample Location: X105B001
Sampled By: T. Rojahn
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	0852	0-24"	Brown	F organics and roots Some silt/clay
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0010204
Sample Location: X10SB001
Sampled By: T. Rojahn
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	0855	2'-4'	Brown	silty clay moist
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (X) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Jared Beckett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0010405
Sample Location: X10SB001
Sampled By: T. Rojahn
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	0904	4-5'	Brown-Green	Clay Some F-M sand
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0020204
Sample Location: X10SB002
Sampled By: J. Birkett
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	0945	2'-4'	Brown	Clayey silt tr. F sand
Method: Hand auger				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

J. Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD002405
Sample Location: X10SB002
Sampled By: J Birkett
C.O.C. No.: 27368

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	0956	4'-5'	Green-Gray	silty clay tr. F sand
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-012610-01

Signature(s): J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X105D0030204
Sample Location: X105B003
Sampled By: J. Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1020	2'-4'	Brown	Forganics and clay some roots
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

J. Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD0030405
Sample Location: X10SB003
Sampled By: J. Birkett
C.O.C. No.: 27320

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1030	4-5'	Green-Brown	silty clay fr. F sand
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (X) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0060006
Sample Location: X10SB006
Sampled By: J. Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1100	0-6"	Brown	F. organics and roots some clay
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD | Duplicate ID No.: —

Signature(s):

J. Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
~~[X]~~ Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD0060024
Sample Location: X10SB006
Sampled By: J Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1140	0-24"	Brown	organics (Fines and roots) some clay
Method: Hand auger ~~HAND~~ JBB 1-26-10				tr. F sand
				Moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD0060204
Sample Location: X10SB006
Sampled By: J Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1118	2'-4'	Brown and	clay some silt tr. Sand
Method:			Green	
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X105D0060405
Sample Location: X105B006
Sampled By: J. Birkett
C.O.C. No.: 27376

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1145	4'-5'	Green-Grey	Clay some silt
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

~~MS/MSD~~ Duplicate ID No.: —

Signature(s):

Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0050006
Sample Location: X10SB005
Sampled By: J Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1215	0-6"	Brown	F. organics and roots some silt/clay wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag ✓	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD005024
Sample Location: X10SD005
Sampled By: J Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1228	0-24	Brown	silt/clay/Forganics some roots tr. Fsand
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	←	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD

Duplicate ID No.: ←

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD00502O4
Sample Location: X10SB005
Sampled By: J Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1235	2'-4'	Gray to Green	clay some silt
Method:				wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD0050405
Sample Location: X10SB005
Sampled By: J. Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1245	4'-5'	Gray-Green	clayey silt Moist
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0040006
Sample Location: X10SB004
Sampled By: J Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1429	0-6"	Brown	Forganics and roots some silt/clay wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X105D0040024
Sample Location: X105B004
Sampled By: J. Birkett
C.O.C. No.: 27370

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1445	0-24"	Brown	clayey silt and F organics/roots
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0040204
Sample Location: X10SB004
Sampled By: J. Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1505	2'-4'	Brown and Green Gray	clayey silt tr. F Sand
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD ✓ | Duplicate ID No.: ✓

Signature(s): Jarod Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0040405
Sample Location: X10SB004
Sampled By: J. Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1515	4'-5'	Green - Gray	clay tr. F sand wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jason Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0070006
Sample Location: X10SD007
Sampled By: J. Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1545	0-6"	Brown	F. organics and roots some clay
Method: Hand auger				Wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
( )	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

Sample ID No.: X105D0070024
Sample Location: X105B007
Sampled By: J Birkett
C.O.C. No.: 27371

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1555	0-24"	Brown	F. organics and roots some clay
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD007O204
Sample Location: X10SB007
Sampled By: J Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1600	2'-4'	Green-Gray	clay some silt
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0070405
Sample Location: X10SB007
Sampled By: T. Rojahn
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-26-10	1610	4-5'	Green-Gray	Clay tr, F sand
Method: Hand Auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0120006
Sample Location: X10SB012
Sampled By: J. Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	0830	0-6"	Brown	F. organics and roots some clay wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Joel Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD012024
Sample Location: X10SB012
Sampled By: J. Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	0840	0-24"	Brown	Forganics and clay w/ roots
Method: Hand auger				wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X105D0120204
Sample Location: X105B012
Sampled By: J Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	0848	2-4'	Brown and Green-Gray	Clay some F sand
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (~~or~~ Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jonathan Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0120405
Sample Location: X10SB012
Sampled By: J. Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	0859	4-5'	Gray and Brown	clay wet
Method: Hand auger			Mottled	
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (X) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0110006
Sample Location: X10SB011
Sampled By: J Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	~~1-27-10~~	0-6"	Brown	F. organics and roots some clay
Method:	0925			wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD: Yes

Duplicate ID No.: —

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD0110024
Sample Location: X10SB011
Sampled By: J. Birkett
C.O.C. No.: 27371

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	0933	0-24"	Brown	Forganics and roots some clay wet
Method: Hand Auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD01102O4
Sample Location: X10SB011
Sampled By: J. Birkett
C.O.C. No.: 27372

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	0940	2'-4'	Light Brown-Green	clay tr. F. sand
Method: Hand Auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0110405
Sample Location: X10SB011
Sampled By: J. Birkett
C.O.C. No.: 27372

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	0955	4'-5'	Green-Gray	clay tr. F sand
Method:				moist
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD01900006
Sample Location: X10SD019
Sampled By: J. Birkett
C.O.C. No.: 27372

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	1111	0-6"	Brown	Forganics and roots/sticks some clay
Method:				wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Joel Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X105D0140024
Sample Location: X105B014
Sampled By: J. Birkett
C.O.C. No.: 27372

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	1120	0-24"	Brown and	F. organics and roots some clay
Method:			Green Gray	wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

At 1.75' bgs hit silty clay

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD01402O4
Sample Location: X10SB014
Sampled By: J Birkett
C.O.C. No.: 27372

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	1131	2'-4'	Brown and Gray	silty clay. tr. F. sand and roots wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (X) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jarad Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD014040S
Sample Location: X10SB014
Sampled By: J. Birkett
C.O.C. No.: 27372

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-27-10	1143	4-5'	Green-Gray	silty clay tr. F. sand
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (X) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD00880006
Sample Location: X10SB008
Sampled By: T. Rajahn
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	0940	0-6"	Brown	F organics and roots some clay wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD00800024
Sample Location: X10SB008
Sampled By: T. Rajahn
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	0935	0-24	Brown	F, organics and roots some clay wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[*] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD00802O4
Sample Location: X10SB008
Sampled By: T. Rojahn
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	0950	2'-4'	Brown	F organics and clay some F sand wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD0080405
Sample Location: X10SB008
Sampled By: T. Rajahn
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	0938	4'-5'	green	clayey silt some F. sand
Method:				wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD009000G
Sample Location: X10SB009
Sampled By: T. Rajahn
C.O.C. No.: 27353

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1110	0-6"	Brown	F. organics and roots some clay
Method:				wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0090024
Sample Location: X10SB009
Sampled By: T. Rojahn
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1025	0-24"	Brown	F organics (roots) and clay tr. ~~Some~~ F. Sand
Method:				Wet JB 2/2/10
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-020210-02

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
~~[]~~ Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X10SD0090204
Sample Location: X10SB009
Sampled By: I. Rojahn
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1045	2'-4'	Brown	F. organics and clay tr F, sand and roots wet
Method: Hard auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0090405
Sample Location: X10SB009
Sampled By: T. Rojahn
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1055	4'-5'	Green	Clay some F sand
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD01500006
Sample Location: X10SB015
Sampled By: S. Birkett
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1235	0-6"	Brown	F. organics and roots some clay wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jarod Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD150024
Sample Location: X10SB15
Sampled By: J Birkett
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1228	0-24"	Brown	F. organics and roots some clay
Method:				wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jonathan Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0150204
Sample Location: X10SB015
Sampled By: J. Birkett
C.O.C. No.: 27373

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1240	2'-4'	Light brown	clay tr. F sand wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
yes	FD-020210-01

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD015040G
Sample Location: X10SB015
Sampled By: J. Birkett
C.O.C. No.: 27374

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1250	4'-6'	mottled grey-gray	clay silt some F sand wet
Method: Hand auger				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (✓) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

J. Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0130006
Sample Location: X10SB013
Sampled By: T. Rojahn
C.O.C. No.: 27374

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1302	0-6"	Brown	F, organics and roots some clay
Method:				wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jared Bell

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0130024
Sample Location: X10SB013
Sampled By: T. Rajahn
C.O.C. No.: 27374

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1309	0-24"	Brown	F. organics and roots some clay
Method:				tr. F sand wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar ( ) or Zip Lock Bag (✓)	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD030204
Sample Location: X10SB013
Sampled By: J. Birkett
C.O.C. No.: 27374

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1317	2-4'	Brown	F. organics w/ roots and clay
Method: Hand auger				tr, F. sand wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (/) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD yes

Duplicate ID No.: —

Signature(s):

Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Stump Neck Impact Area (UXO 10)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[X] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X10SD0130405
Sample Location: X10SB013
Sampled By: T. Rajahn
C.O.C. No.: 27374

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
2-2-10	1335	4'-5'	Green-Gray	clay tr. M sand
Method:			mottled	wet
Hand auger				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar (X) or Zip Lock Bag ( )	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.6

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

APPENDIX F.7

SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 12

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27382 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412) 921 8308
LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER / ANNA MILLIKEN			
SAMPLERS (SIGNATURE): Ellen Burkette	FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8308	ADDRESS: 34 DOGWOOD LANE
	CARRIER/WAYBILL NUMBER: FED EX AB# 8631 2526 7720		CITY, STATE: MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES 8 OZ JAR	EXPLOSIVES 1L GLASS AMBER ICE, pH & TOC 40Z JAR						COMMENTS
		TORPEDO BURIAL SITE (UXO12)							G	4°C	4°C	4°C						
3/10	1030	RB031010-01	QC	-	-	AQ	G	2	-	2								
3/10	1040	X12SB0010204	SB 001	2	4	SO	G	2	1	-	1							
3/10	1050	X12SB0010406	↓	4	6	SO	G	2	1	-	1							
3/10	1100	X12SB0050204	SB 005	2	4	SO	G	1	1									RUN MS/MSD
3/10	1105	X12SB0050406	↓	4	6	SO	G	1	1									
3/10	1115	X12SB0070204	SB 007	2	4	SO	G	1	1									
3/10	1120	X12SB0070406	↓	4	6	SO	G	1	1									
3/10	1135	X12SB0080204	SB 008	2	4	SO	G	1	1									
3/10	1140	X12SB0080406	↓	4	6	SO	G	1	1									
3/10	1150	X12SB0060204	SB 006	2	4	SO	G	1	1									
3/10	1200	X12SB0060406	↓	4	6	SO	G	1	1									
3/10	1315	X12SB0100204	SB 010	2	4	SO	G	1	1									
3/10	1320	X12SB0100406	↓	4	6	SO	G	1	1									

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Ellen Burkette	3/10/10	1830	1. RECEIVED BY: FEDERAL EXPRESS	3/10/10	1930
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27381 | PAGE 1 OF 1

PROJECT NO: CTO: 112600810 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308
SAMPLERS (SIGNATURE) Ellen Berkette		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857
		CARRIER/WAYBILL NUMBER FED. EX. AB# 8831 2526 7720	CITY, STATE MIDDLETOWN, PA

LABORATORY NAME AND CONTACT: ANALYTICAL LAB SEC. / ANNA MILLKEN

ADDRESS: 34 DOGWOOD LANE

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES 8oz JAR	TYPE OF ANALYSIS: TEC, pH & TOC 8oz JAR	COMMENTS
		TORPEDO BURIAL SITE (UX012)							G	4°C			
									G	4°C			
3/10	1325	X12SB009 0204	SB009	2	4	SO	G	1	1				
3/10	1330	X12SB009 0406	↓	4	6	SO	G	1	1				
3/10	1335	X12SB004 0204	SB004	2	4	SO	G	1	1				
3/10	1340	X12SB004 0406	↓	4	6	SO	G	1	1				
3/10	1350	X12SB003 0204	SB003	2	4	SO	G	1	1				
3/10	1355	X12SB003 0406	↓	4	6	SO	G	1	1				
3/10	1405	X12SB002 0204	SB002	2	4	SO	G	2	1	1			
3/10	1410	X12SB002 0406	↓	4	6	SO	G	1	1				
3/10	0000	FD031010-01	QC	–	–	SO	G	1	1				FROM X12SB002 0204

1. RELINQUISHED BY Terry Nagel	DATE 3/10/10	TIME 1830	1. RECEIVED BY FEDERAL EXPRESS	DATE 3/10/10	TIME 1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27422 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANNA MILLIKEN / ANALYTICAL LAB SEC
SAMPLERS (SIGNATURE) Terry Lyall		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX AB # 863125263893		CITY, STATE MIDDLETOWN PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)								COMMENTS
									G	G							
									PRESERVATIVE USED								
		TORPEDO BURIAL SITE (UXO 12)							4°C	4°C							
									TYPE OF ANALYSIS: EXPLOSIVES 1L GLASS AMBER	EXPLOSIVES 8oz JAR							
3/18/2010	1335	X12SW001	X12SW001	-	-	SW	G	6	6								RUN MS/MSD
3/18	1345	X12SD001	X12SD001	0	0.5	SD	G	1	-	1							
3/18	1350	X12SD002	X12SD002	0	0.5	SD	G	1	-	1							RUN MS/MSD
3/18	0000	FD03/810-03	QC	—	-	SD	G	1	-	1							FROM X12SD001
3/18	0000	FD03/810-04	QC	—	-	SW	G	2	2								FROM X12SW001

1. RELINQUISHED BY Terry Lyall	DATE 3-18-10	TIME 1830	1. RECEIVED BY FEDERAL EXPRESS	DATE 3-19-10	TIME 1830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031010-01
Sampled By: T. ROJAHN
C.O.C. Number: 27382

[] Trip Blank
[] Source Water Blank
[x] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-10-10
Time: 1030
Method: POUR THROUGH SLEEVE

WATER SOURCE:

[] Laboratory Prepared
[x] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENV.
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: Soil
Equipment Used: DPT SAMPLE SLEEVE
Equipment Type:
[x] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES (NO)
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES (NO)

OBSERVATIONS / NOTES:

Signature(s):

Tony Rojahn

Tetra Tech NUS, Inc.

SURFACE WATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

- [X] Stream
- [] Spring
- [] Pond
- [] Lake
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X12SW001
Sample Location: 12SW001
Sampled By: T. ROJAHN
C.O.C. No.: 27422

Type of Sample:
- [X] Low Concentration
- [] High Concentration

SAMPLING DATA:

Date: 3-18-10 / Time: 1335 / Depth: SURFACE / Method: Direct Dip	Color Visual	pH Standard	S.C. mS/cm	Temp. Degrees C	Turbidity NTU	DO mg/l	Salinity %	Other NA
	CLEAR	5.83	48	13.54	48	2.42	0.0	TDS 0.31 / ORP 119

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives	4°C	(2) L Glass Amber	Yes

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	FD031810-04

Signature(s):

Ty Rojahn

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[■] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X125D001
Sample Location: 125D001
Sampled By: T. ROSAHN
C.O.C. No.: 27422

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3-18-10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1345	0-6"	LT BRN	CLAYEY SILT, WET-SAT. W/ORGANIC MATERIAL
Method: DIS TROWEL			
Monitor Reading (ppm): -			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
-	FD031810-03

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X1250002
Sample Location: 1250002
Sampled By: T. ROJAHN
C.O.C. No.: 27422

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3-18-10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1350	0-6"	Lt. BRN	Clayey Silt, Wet - Sat. w/ organic matter
Method: Dis Trowel			
Monitor Reading (ppm): -			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
YES	_____

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X12SB001024
Sample Location: X12SB001
Sampled By: Ellen Berkette
C.O.C. No.: 27382

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: (1420)	2-4'	Rust/Tan	Wet Sandy Clay, trace organics VF-F
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

Collected Expl ✓

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB001040/0
Sample Location: X12SB001
Sampled By: Ellen Berkstresser
C.O.C. No.: 27382

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0950	4-6'	olive green	Saturated, Clayey VF-F Sand (5:5')
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X12SB005
Sample Location: X12SB005D2F
Sampled By: EB
C.O.C. No.: 27382

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1100	2-4'	Rust/Tan	VF-F Sandy Clay, Moist
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X12SB005
Sample Location: X12SB005 0406
Sampled By: EB
C.O.C. No.: Z7382

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1105	4-6'	~~Red~~ Olive-Green	Wet, Clayey VF-F Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB007
Sample Location: X12SB007024
Sampled By: E.B.
C.O.C. No.: 27382

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1115	2-4'	Rust Tan	Moist VF-F Sandy Clay
Method: DPT			
Monitor Reading (ppm): -			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
Project No.: 112G00810, CTO 423

Sample ID No.: X12SB007
Sample Location: X12SB007 0to2
Sampled By: EB
C.O.C. No.: 27382

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1120	4-6'	~~Oli~~ Gray/Brown	Moist Clayey VF Sand
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB008Q204
Sample Location: X12SB008
Sampled By: EB
C.O.C. No.: 27382

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1135	2-4	Rust/Tan	VF Sandy Clay, Moist
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkhite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB008046
Sample Location: X12SB008
Sampled By: EB
C.O.C. No.: 27382

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1140	4-6	Gray	Moist Clayey VF-Fine Sand w/pebbles
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

Sample ID No.: X12SB006Q20F
Sample Location: X12SB006
Sampled By: ER
C.O.C. No.: 27382

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10 Time: 1150 Method: DPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	~~2~~ 24	Rust/Tan	VFF Sandy Clay, Moist

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB06040
Sample Location: X12SB06
Sampled By: EB
C.O.C. No.: 27382

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1200	4-6	Green/Gray	Clayey, VF-F Sand, Moist
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB010024
Sample Location: X12SB01
Sampled By: Ellen Berkelite
C.O.C. No.: 27382

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/2010	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1315	2-4'	Rust Brown	VF-F Sandy Clay, Moist
Method: DPT			
Monitor Reading (ppm): -			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
-	-

Signature(s): Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

Sample ID No.: X12SB010406
Sample Location: X12SB010
Sampled By: EllenBerkstresser
C.O.C. No.: 27382

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/2010 Time: 1320 Method: DPT Monitor Reading (ppm): —	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	4-6'	Green-brown	Well graded VF-M Sand, wet

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB009020M
Sample Location: X12SB009
Sampled By: Ellen Berkitte
C.O.C. No.: 27381

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1325	2-4	Rust Brown	VF-F Sandy Clay, Moist
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkitte

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB009-0406
Sample Location: X12SB009
Sampled By: Ellen Berkstresser
C.O.C. No.: 27381

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1530	4-6	Green-Gray	VF-M Sand w/pebbles, wet, some clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
112G00810, CTO 423

Project No.:
[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: XSB004O204
Sample Location: XSB004
Sampled By: EB
C.O.C. No.: 27381

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1335	2-4	Rust-Brown	Moist, VF-F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: XSB004046
Sample Location: XSB004
Sampled By: EB
C.O.C. No.: 27381

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1340	4-6	Gray	Moist, VF-F Clayey Sand
Method: DPT			
Monitor Reading (ppm): -			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
_____	_____

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

- [] Surface Soil
- [✓] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X12SB003204
Sample Location: X12SB003
Sampled By: Ellen Berkstresser
C.O.C. No.: 27381

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1350	2-4'	Rust/Tan	VF-F Sandy clay; Moist
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB003406
Sample Location: X12SB003
Sampled By: Ellen Berkelite
C.O.C. No.: 27381

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1355	4-6'	Gray	VF-M Clayey Sand, wet
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB002024
Sample Location: X12SB002
Sampled By: Ellen Berkhite
C.O.C. No.: 27381

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1405	2-4'	Rust Brown	Mod, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): -			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD: —

Duplicate ID No.: FD-03b10-01-~~0204~~ TC
~~FD-03b10-01-0406~~

Signature(s):

Ellen Berkhite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Burial Site (UXO 12)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X12SB002046
Sample Location: X12SB002
Sampled By: Ellen Berkstresser
C.O.C. No.: 27391

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/10/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1440	4-6'	Rust Brown to Green	VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.8

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-03010-01-0446

Signature(s):

Ellen Berkstresser

APPENDIX F.8

SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 21

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27387 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER. / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX AB# 8631 2526 5430		CITY, STATE MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)								COMMENTS
		TEST AREA (WXO 21)							PRESERVATIVE USED		A^06	A^06					
									TYPE OF ANALYSIS		EXPLOSIVES	EXPLOSIVES					
											ZIP LOCK BAGS	IL GLASS AMBER					
3/11	0914	RB031110-02	QC	-	-	AQ	G	2	-	2							
3/11	0938	X2155001 0006	SB 001	0	0.5	SO	C	1	1								
3/11	0940	X2155001 0024	↓	0	2	SO	C	1	1								
3/11	1030	X2155002 0006	SB 002	0	0.5	SO	C	1	1								
3/11	1035	X2155002 0024	↓	0	2	SO	C	1	1								
3/11	1050	X2155003 0006	SB 003	0	0.5	SO	C	1	1								
3/11	1055	X2155003 0024	↓	0	2	SO	C	1	1								
3/11	1055	X2155004 0006	SB 004	0	0.5	SO	C	1	1								
3/11	1100	X2155004 0024	↓	0	2	SO	C	1	1								
3/11	1115	X2155005 0006	SB 005	0	0.5	SO	C	1	1								
3/11	1120	X2155005 0024	↓	0	2	SO	C	1	1								
3/11	1130	X2155006 0006	SB 006	0	0.5	SO	C	1	1								
3/11	1135	X2155006 0024	↓	0	2	SO	C	1	1								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tom Rojahn	3/11/10	1825	1. RECEIVED BY FEDERAL EXPRESS	3/11/10	1825
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27388 | PAGE 1 OF 1

PROJECT NO: 112600810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANAMA ANALYTICAL LAB SER. / MILLKEN
SAMPLERS (SIGNATURE) Tony Rojahn		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED. EX AB # 8631 2526 5430		CITY, STATE MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES	ZIP LOCK BAGS	CEC, P/M & TOC 4oz JAR	COMMENTS
		TEST AREA (UXO 21)												
3/11	1310	X2155007 0006	SB 007	0	0.5	SO	(G)/C	1	1					
3/11	1306	X2155007 0024	↓	0	2	SO	C	2	1		1			
3/11	1150	X2155008 0006	SB 008	0	0.5	SO	C	1	1					
3/11	1155	X2155008 0024	↓	0	2	SO	C	1	1					
3/11	1125	X2155009 0006	SB 009	0	0.5	SO	C	1	1					
3/11	1320	X2155009 0024	↓	0	2	SO	C	2	1		1			
3/11	1337	X2155010 0006	SB 010	0	0.5	SO	C	2	1		1			
3/11	1333	X2155010 0024	↓	0	2	SO	C	1	1					
3/11	1410	X2155011 0006	SB 011	0	0.5	SO	C	1	1					
3/11	1358	X2155011 0024	↓	0	2	SO	C	1	1					
3/11	1352	X2155012 0006	SB 012	0	0.5	SO	C	1	1					
3/11	1340	X2155012 0024	↓	0	2	SO	C	1	1					
3/11	1445	X2155013 0006	SB 013	0	0.5	SO	C	1	1					

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Rojahn	3/11/10	1825	1. RECEIVED BY FEDERAL EXPRESS	3/11/10	1825
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27389 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER. / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED. EX AB# 8631 2526 5430		CITY, STATE MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES ZIP LOCK BAGS	COMMENTS
		TEST AREA (UXO 21)										
3/11	1440	X2155013 0024	SB 013	0	2	SO	C	1	1			
3/11	1420	X2155014 0006	SB 014	0	0.5	SO	C	1	1			
3/11	1415	X2155014 0024	↓	0	2	SO	C	1	1			
3/11	1500	X2155015 0006	SB 015	0	0.5	SO	C	1	1			
3/11	1455	X2155015 0024	↓	0	2	SO	C	1	1			
3/11	1515	X2155016 0006	SB 016	0	0.5	SO	C	1	1			
3/11	1510	X2155016 0024	↓	0	2	SO	C	1	1			
3/11	0000	FD03/110-02	QC	—	—	SO	C	1	1			FROM X2155014 0006

1. RELINQUISHED BY Terry Segal	DATE 3/11/10	TIME 1825	1. RECEIVED BY FEDERAL EXPRESS	DATE 3/11/10	TIME 1825
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27396 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER: R. BASINSKI	PHONE NUMBER: (412) 921-8308
SAMPLERS (SIGNATURE): Tony Rojahn		FIELD OPERATIONS LEADER: T. ROJAHN	PHONE NUMBER: (412) 921-8857
		CARRIER/WAYBILL NUMBER: FED EX AB# 8631 2526 7719	

LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER. / ANNA MILLKEN

ADDRESS: 34 DOGWOOD LANE

CITY, STATE: MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES ZIP LOCK BAGS	COMMENTS
		TEST AREA 1 (UXO 21)								R / HCl		
3/12	0825	X21SS0170006	SB 017	0	0.2	SO	C	1	1			
3/12	0830	X21SS017 0024	↓	0	2	SO	C	1	1			
3/12	0836	X21SS018 0024	SB 018	0	2	SO	C	1	1			
3/12	0841	X21SS018 0006	↓	0	0.5	SO	C	1	1			
3/12	0855	X21SS019 0006	SB 019	0	0.5	SO	C	1	1			
3/12	0900	X21SS019 0024	↓	0	2	SO	C	1	1			RUN MS/MSD
3/12	0900	X21SS020 0006	SB 020	0	0.5	SO	C	1	1			
3/12	0912	X21SS020 0024	↓	0	2	SO	C	1	1			RUN MS/MSD
3/12	0930	X21SS021 0006	SB 021	0	0.5	SO	C	1	1			
3/12	0000	FD031210-01	QC	–	–	SO	C	1	1			FROM X21SS018 0024

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Tony Rojahn	3-15-10	1900	1. RECEIVED BY: FEDERAL EXPRESS	3-15-10	1900
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031110-02
Sampled By: T. ROJAHN
C.O.C. Number: 27387

[] Trip Blank
[] Source Water Blank
[X] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-11-10
Time: 0914
Method: POUR OVER HAND CORE

WATER SOURCE:

[] Laboratory Prepared
[X] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENV
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: SOIL
Equipment Used: HAND CORE
Equipment Type:
[] Dedicated
[X] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES / (NO)
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Ted Rojahn

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X215S0010006
Sample Location: X215B001
Sampled By: TR
C.O.C. No.: 27387

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: ~~3/11/10~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: ~~0936~~	~~0-6"~~	~~Brown~~	
Method: ~~HA~~			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3/11/10	0936	0-6"	Brown	Moist, Very Fine Sandy Clay
Method: HAND Core HA (TR)				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS0010024
Sample Location: X21SB001
Sampled By: SC
C.O.C. No.: 27387

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE - HA (FT)	0940	0-24"	Brown/Gray	Moist, V. Fine-Fine Sandy Clay with some pebbles.
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tony Capil FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

Sample ID No.: X21SS002006
Sample Location: X21SB002
Sampled By: TR
C.O.C. No.: 27387

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: ~~3/11/10~~			
Time: ~~1030~~			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE ~~HAIC~~	1030	0-6"	Rust Brown	V. Fine-Fine Sandy Clay, Moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Terry Rojahn

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)
Project No.: 112G00810, CTO 423

Sample ID No.: X21SS002024
Sample Location: X21SB002
Sampled By: SC
C.O.C. No.: 27387

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE	1035	0-24"	Rust Brown	Moist, V. Fine-Fine Sandy Clay with Some pebbles.
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tony Royal FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

Sample ID No.: X21550030006
Sample Location: X21SB003
Sampled By: TR
C.O.C. No.: 27387

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other:
- [] QA Sample Type:

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND Core HA (TR)	1050	0-6"	D. Brown	V. Fine Fine Sandy Silt; Moist, With organics.
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Terry Rogers

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

Sample ID No.: X21550030024
Sample Location: X21SB003
Sampled By: TR / SC
C.O.C. No.: 27387

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	~~3/11/10~~ 1055	~~1055~~ 0-2' (TR)	D. Brown	D. Fine-Fine Sandy Clay with Some organics and pebbles.
Method: (TR) HAND Core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tim Lopiak FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X215S004-0006
Sample Location: X215B004
Sampled By: TR
C.O.C. No.: 27387

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE ~~HA~~ TR	1055	0-6"	D. Brown-Brown	V. Fine-Fine Sandy clay, Moist, With pebbles.
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tony Rizzi

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS004002A
Sample Location: X21SB004
Sampled By: SC
C.O.C. No.: 27387

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE - HA (TS)	1100	0-24"	Rust	V. Fine Sandy Clay, Trace organics.
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Ty Kosik FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS005000
Sample Location: X21SB005
Sampled By: TR
C.O.C. No.: 27387

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA (TC)	1115	0-6"	D. Brown	V. Fine-Medium Sandy Silt, Moist, with Pebbles and organics.
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Tony Capel

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS005024
Sample Location: X21SB005
Sampled By: SC
C.O.C. No.: 27387

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA (TC)	1120	0-24"	Brown	U. Fine - Fine Sandy Clay with pebbles and organics. Moist.
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Ted Agnew FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS006 0006
Sample Location: X21SB006
Sampled By: TR
C.O.C. No.: 27387

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: ~~3/11/2010~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: ~~1130~~			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: Hand Core + HA (TC)	1130	0-6"	Brown	V. Fine-Fine Sandy Clay, Moist, with some pebbles and organics.
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Terry Quick

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS006-0024
Sample Location: X21SB006
Sampled By: SC
C.O.C. No.: 27387

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA TR	1135	0-24"	Brown	V. Fine-Fine Sandy Silt, Moist, With some pebbles.
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tony Zapia for SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS007006
Sample Location: X21SS007
Sampled By: TR
C.O.C. No.: 27388

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1310	0-6"	brn/red	Silt w/ some sand and trace organics. Slightly moist
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS007024
Sample Location: X21SB007
Sampled By: SC
C.O.C. No.: 27388

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1306	0-24"	red light brn mottles	Silt with some Sand. Slightly moist to dry.
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X21SS008006
Sample Location: X21SB008
Sampled By: TR
C.O.C. No.: 27388

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/11/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND Core	1150	0-6"	Brown	Moist, V. Fine-Fine Sandy Clay, with some organics & pebbles.
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS008024
Sample Location: X21SB008
Sampled By: SC
C.O.C. No.: 27398

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3/11/10	1155	0-24"	Brown	V. Fine-Fine Sandy Clay, Moist, with trace pebbles and organics.
Method: HAND CORE HA (TA)				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tony Zgil FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS009 0006
Sample Location: X21SB009
Sampled By: TR
C.O.C. No.: 27388

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1325	0-6"	brn/red	Silt w/ trace sand and organics. Slightly moist.
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

Sample ID No.: X21SS009002
Sample Location: X21SB009
Sampled By: SBC
C.O.C. No.: 27388

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1320	0-24"	Red w/ some blk	Silt w/ trace sand & clay. Trace organics.
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS0100006
Sample Location: X21SB0100006
Sampled By: TR
C.O.C. No.: 27388

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1339	0-6"	red brown	Sandy Silt w/ trace organics
Method: Hand Core				Slightly moist
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	YES	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS01D0024
Sample Location: X21SS01D
Sampled By: SBC
C.O.C. No.: 27389

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1333	0-24"	brown/red mottled	Silt w/ some Sand. Slightly moist
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X21SS011006
Sample Location: X21SS01
Sampled By: TR
C.O.C. No.: 27388

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1410	0-6"	red	Silt w/ trace sand and clay. Trace organics. Slightly moist.
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD: No

Duplicate ID No.: No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

Sample ID No.: X21SS011002A
Sample Location: X21SB011
Sampled By: SBC
C.O.C. No.: 27389

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1358	0-24"	red	Sandy silt w/ trace organics. Slightly moist
Method: Hand core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS012U006
Sample Location: X21SS012
Sampled By: TR
C.O.C. No.: 27388

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1352	0-6"	Dark brn, light brn and red. Silt w/ trace sand & clay. Some	
Method: Hand Core				organics. Slightly moist
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

Sample ID No.: X21SS012G024
Sample Location: X21SB012
Sampled By: SBC
C.O.C. No.: 27383

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1340	0-24"	light tan/brn	Sandy silt w/ trace organics. slightly moist
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X21SS013aa
Sample Location: X21SB013
Sampled By: TR
C.O.C. No.: 27388

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1445	0-6"	light brn / gray	Silt w/ trace Sand and clay. Trace organics. Moist to wet.
Method: Hand Core				
Monitor Readings (Range in ppm): ~				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS01300024
Sample Location: X21SB013
Sampled By: SBC
C.O.C. No.: 27389

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1440	0-24"	light brn	clayey silt / silty clay. Trace organics.
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No.

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS04000G
Sample Location: X21SB014
Sampled By: TR
C.O.C. No.: 27389

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1420	0-6"	brown red mottled	Silt w/ some sand and clay, Trace Organics, Slightly moist
Method: Hand Core				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	FD-031110-02

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)
Project No.: 112G00810, CTO 423

Sample ID No.: X21SS014002A
Sample Location: X21SB04
Sampled By: SBL
C.O.C. No.: 27389

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1415	0-24"	light brn	Sandy silt w/ trace organics, slightly moist.
Method: Handcore				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS01SA006
Sample Location: X21SB015
Sampled By: TR
C.O.C. No.: 27389

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1500	0-6"	brn/red	Sandy silt w/ trace gravel and organics, slightly moist.
Method: Handcore				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)
Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS015S0024
Sample Location: X21SS015
Sampled By: SBL
C.O.C. No.: 27389

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

~~Date:~~	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1455	0-24"	red	Silty Sand w/ trace gravel and organics, slightly moist to dry.
Method: Hand Core				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS01B0006
Sample Location: X21SB01b
Sampled By: TR
C.O.C. No.: 27389

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1515	0-6"	light brn	Clayey silt w/ trace sand & organics. Moist.
Method: Hand Core				
Monitor Readings (Range in ppm): ~				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD (TR) Yes NO

Duplicate ID No.: No

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS01600Z4
Sample Location: X21SB016
Sampled By: SBC
C.O.C. No.: 27389

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3-11-10	1510	0-24"	brn	Silt w/ some Sand & trace
Method:				Organics. Slightly moist
Hand Core				
Monitor Readings				
(Range in ppm):				
—				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X21SS017 0006
Sample Location: X21SB017
Sampled By: TR
C.O.C. No.: 27390

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date: 3/12/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND Core HA (TR)	0825	0-6"	Rust Brown	Moist, V.F-Fine Sandy Clay
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes ✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Terry Royal

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS01 0024
Sample Location: X21SB017
Sampled By: SC
C.O.C. No.: 27396

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/12/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND Core HA (IS)	0830	0-24"	Rust Brown	V.F-Fine Sandy clay with pebbles Moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tony Gail for SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X21SS01B0024
Sample Location: X21SB018
Sampled By: SC
C.O.C. No.: 27396

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/12/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA (TL)	0830	0-24"	Rust Brown	Moist, V.F-Fine, Sandy Clay w/ pebbles
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag ✓	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: YES FD031210-01

Signature(s):

Terry Rogers FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

Sample ID No.: X21SS01800006
Sample Location: X21SB018
Sampled By: TR
C.O.C. No.: 27396

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/12/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	0941	0-1'	D. Brown/Brown	VF-Med. Sandy clay, MOIST
Method: HAND AUGER (TC)				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Terry Rynk

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

Sample ID No.: X21SS019006
Sample Location: X21SB019
Sampled By: TR
C.O.C. No.: 27396

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date: 3/12/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA (TR)	0955	0-6"	Lt. Brown/Tan	VF-Fine Sandy Clay, Moist, With Organics
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X21SS019 0224 (TR)
Sample Location: X21SB019
Sampled By: SC
C.O.C. No.: 27396

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/12/18	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE-HA (TR)	0930	0-2"	Rust Brown	V. Fine-Fine Sandy Clay, Moist
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s):

Ty Azil FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X2SS020006
Sample Location: X2SB020
Sampled By: TR
C.O.C. No.: 27396

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date: 3/12/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND CORE HA TR	0960	0-6"	Tan	wet, VF-med. Sandy Clay with pebbles
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag ✓	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

Sample ID No.: X21SS020024
Sample Location: X21SB020
Sampled By: SC
C.O.C. No.: 27396

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
3/12/10	0912	0-24"	Tan	Wet, V.F-Med, Clayey Sand with pebbles
Method: HAND CORE TA-TC				
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes ✓	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s):

Terry Royal FOR SC

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Test Area 1 (UXO 21)

Project No.: 112G00810, CTO 423

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X21SS02I0006
Sample Location: X21SB021
Sampled By: TR
C.O.C. No.: 27396

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date: 3/12/10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method: HAND Core HA (TR)	0930	0-6"	D. Brown	V.F.-Fine Sandy Silt (Moist) with pebbles
Monitor Readings (Range in ppm): —				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

COLLECTED IN HOLD CREATED BY A TREE

MAP:

SEE FIGURE 18.7

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ty Graham

APPENDIX F.9

SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 23

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27385 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412)921-8308	LABORATORY NAME AND CONTACT: ANALYTICAL LAB SER. / ANNA MILLKEN
SAMPLERS (SIGNATURE) Ellen Berkhiser		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412)921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED EX AB # 8631 2526 5430		CITY, STATE MIDDLETOWN, PA

STANDARD TAT [X]
RUSH TAT [ ]
[ ] 24 hr. [ ] 48 hr. [ ] 72 hr. [ ] 7 day [ ] 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)		G	G	G	R					
									PRESERVATIVE USED		4°C	4°C	4°C	4°C/HNO3					
									TYPE OF ANALYSIS		EXPLOSIVES 8oz JAR	METALS	EXPLOSIVES 1L GLASS AMBER	METALS 250ml HDPE					COMMENTS
3/11	~~0314~~ 0305 (TR)	TORPEDO CASING STORAGE AREA (UXO 23) RB031110-01	QC	—	—	AQ	G	3			—	—	2	1					
3/11	0800	X23SB009 0204	SB009	2	4	SO	G	2			1	1							
3/11	0805	X23SB009 0406	↓	4	6	SO	G	2			1	1							
3/11	0810	X23SB010 0204	SB010	2	4	SO	G	2			1	1							
3/11	0815	X23SB010 0406	↓	4	6	SO	G	2			1	1							
3/11	0830	X23SB008 0204	SB008	2	4	SO	G	2			1	1							
3/11	0835	X23SB008 0406	↓	4	6	SO	G	2			1	1							
3/11	0845	X23SB007 0204	SB007	2	4	SO	G	2			1	1							
3/11	0850	X23SB007 0406	↓	4	6	SO	G	2			1	1							
3/11	0900	X23SB005 0204	SB005	2	4	SO	G	2			1	1							
3/11	0905	X23SB005 0406	↓	4	6	SO	G	2			1	1							
3/11	0915	X23SB003 0204	SB003	2	4	SO	G	2			1	1							
3/11	0920	X23SB003 0406	↓	4	6	SO	G	2			1	1							

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Ted Rojahn	3/11/10	1825	1. RECEIVED BY FEDERAL EXPRESS	3/11/10	1825
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27386 | PAGE 1 OF 1

PROJECT NO: 112G00810 CTO: 423	FACILITY: NSF INDIAN HEAD	PROJECT MANAGER R. BASINSKI	PHONE NUMBER (412) 921-8308	LABORATORY NAME AND CONTACT: ANNA MILLKEN / ANALYTICAL LAB SEC.
SAMPLERS (SIGNATURE) Ellen Rudolph		FIELD OPERATIONS LEADER T. ROJAHN	PHONE NUMBER (412) 921-8857	ADDRESS 34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER FED. EX. AB# 8631 2526 5430		CITY, STATE MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: EXPLOSIVES 8oz JAR	METALS 4oz JAR	CEC, PH & TOC 8oz JAR	COMMENTS
		TORPEDO CASING STORAGE AREA (UXO 23)					CONTAINER TYPE PLASTIC (P) or GLASS (G)		G	G	G	
							PRESERVATIVE USED		4°C	4°C	4°C	
3/11	0940	X23SB002 0204	SB 002	2	4	SO	G	2	1	1		
3/11	0945	X23SB002 0406	↓	4	6	SO	G	3	1	1	1	
3/11	0950	X23SB004 0204	SB 004	2	4	SO	G	3	1	1	1	
3/11	0955	X23SB004 0406	↓	4	6	SO	G	3	1	1	1	
3/11	1010	X23SB006 0204	SB 006	2	4	SO	G	2	1	1		
3/11	1015	X23SB006 0406	↓	4	6	SO	G	2	1	1		RUN MS/MSD
3/11	0930	X23SB001 0204	SB 001	2	4	SO	G	2	1	1		
3/11	0935	X23SB001 0406	↓	4	6	SO	G	2	1	1		
3/11	0000	FD031110-01	QC	-	-	SO	G	2	1	1		FROM X23SB006 0204

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Boyd	3/11/10	1825	1. RECEIVED BY FEDERAL EXPRESS	3/11/10	1825
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location: QC
QA Sample Type:

Sample ID Number: RB031110-01
Sampled By: T. ROJAHN
C.O.C. Number: 27385

[] Trip Blank
[] Source Water Blank
[x] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 3-11-10
Time: 0905
Method: POUR THROUGH SLEEVE

WATER SOURCE:

[] Laboratory Prepared
[x] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL DI H2O
Supplier: FIELD ENV.
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: Soil
Equipment Used: DPT SAMPLE SLEEVE
Equipment Type:
[x] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / (NO)
Explosives	Cool 4°C	(2) 1 L Amber Glass	(YES) / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	(YES) / NO
Volatiles for soils only	NaHSO4 & MeOH	40ml Vials 1w/MeOH and 2 w/NaHSO4	YES / (NO)

OBSERVATIONS / NOTES:

Signature(s):

Tony Rojahn

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

Sample ID No.: X23SB009024
Sample Location: X23SB009
Sampled By: EB
C.O.C. No.: 27385

- [] Surface Soil
- [X] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 3/11/10			
Time: 0900	2-4'	Rust/Brown	Moist, V.F.F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berklite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X23SB009046
Sample Location: X23SB009
Sampled By: ER
C.O.C. No.: 27385

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0905	4-6'	Rust Brown/ gray	Moist, V.F-F Sandy Clay some pebbles
Method: PPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X23SB010024
Sample Location: X23SB010
Sampled By: EB
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0910	24'	Rust/Brown	Moist/V.F-F Sandy clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

Sample ID No.: X23SB01004-06
Sample Location: X23SB010
Sampled By: EB
C.O.C. No.: 27385

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/1/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0415	4-6'	Brown/Gray	Moist, V.F-Fine Sandy Clay, Saturated at 5.5' some pebbles
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X235B0080284
Sample Location: X235B108
Sampled By: EB
C.O.C. No.: 27385

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0430	2-4'	Rust/Brown	Moist, V.F.F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

Sample ID No.: X23SB008040
Sample Location: X23SB008
Sampled By: EB
C.O.C. No.: 27385

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0435	4-6	Rust/Brown Gray	Moist, V.F-F Sandy clay w/Pebbles
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berdelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X235B007D204
Sample Location: X235B007
Sampled By: EB
C.O.C. No.: 27395

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0845	2-4'	Rust Brown	Moist, V.F.-F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X23SB07-0406
Sample Location: X23SB07
Sampled By: ER
C.O.C. No.: 27385

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0950	4-6'	Brown/gray	Moist U.F-F Sandy Clay w/pebbles
Method: DPT			Saturated at 6'
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkelite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X23SB005024
Sample Location: X23SB005
Sampled By: EB
C.O.C. No.: 27385

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0900	2-4'	Rust Brown	Moist, VF-F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berdette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

Sample ID No.: X235B005-0406
Sample Location: X235B005
Sampled By: EB
C.O.C. No.: 27385

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0905	4-6'	Rust Brown Gray	Moist, Vf-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: X23SB03024
Sample Location: X23SB03
Sampled By: EB
C.O.C. No.: 27385

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0915	24-	Rust Brown	Moist, VFF Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

Sample ID No.: X23SB083Ud
Sample Location: X23SB03
Sampled By: EB
C.O.C. No.: 27385

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0920	4-6'	Rust Brown	Moist VF-F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Ellen Berkette

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X23SB002020204
Sample Location: X23SB002
Sampled By: EB
C.O.C. No.: 27386

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0940	2-4'	Rust Brown	Moist VF-F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Ellen Berkstate

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)

Project No.: 112G00810, CTO 423

[] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X23SB002040606
Sample Location: X23SB002
Sampled By: EB
C.O.C. No.: 27386

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0945	4-6'	Rust Brown	Moist, VF F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar	Yes	

OBSERVATIONS / NOTES:

pH, CEC, TOC

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkbite

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X23SB004024
Sample Location: X23SB004
Sampled By: EB
C.O.C. No.: 27386

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0950	24'	Rust Brown	Moist, VF-F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar	YES	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkebile

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)

Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X23SB004-0406
Sample Location: X23SB004
Sampled By: EB
C.O.C. No.: 27386

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0955	4-6'	Rust Brown Gray	Moist, VF Sandy Clay, with pebbles
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar	YES	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X23SB001602D4
Sample Location: X23SB001
Sampled By: EB
C.O.C. No.: 27386

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/02	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1010	2-4'	Rust Brown	MOIST, VF-F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD —

Duplicate ID No.: ~~FD031110-01~~ FD031110-01

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

Sample ID No.: X23SB006-0406
Sample Location: X23SB006
Sampled By: EB
C.O.C. No.: 27386

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1015	4-6'	Rust Brown/ Gray	Moist, VF-F Sandy Clay
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings				
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: —

Signature(s): Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

~~[]~~ Surface Soil
~~[]~~ Subsurface Soil
[] Sediment
[] Other: _____
[] QA Sample Type: _____

Sample ID No.: ~~SB001~~ 23SB001-0204
Sample Location: ~~SB001~~ 23SB001
Sampled By: EB
C.O.C. No.: 27386

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0936	2-4'	Rust/tan	~~Sandy~~ Silty Clay, trace organics
Method: DPT			
Monitor Reading (ppm): —			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.: —

Signature(s):

Ellen Berkstresser

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Torpedo Casing Storage Area (UXO 23)
Project No.: 112G00810, CTO 423

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: X23SB001-0406
Sample Location: X12SB001
Sampled By: EB
C.O.C. No.: 27386

Type of Sample:
[X] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 3/11/10	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0935	4-6'	Olive Green Gray	Moist, VF-Fine Sandy Clay
Method: DPT			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives	(1) 8oz Jar	Yes	
Metals	(1) 4oz Jar	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.9

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Ellen Berkstresser

APPENDIX F.10

SOIL AND SEDIMENT SAMPLE LOG SHEETS – UXO 28

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27358 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA MILLER
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Royal		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX AB # 8631 2526 3882		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES / METALS PLASTIC ZIPLOCK BAG	4°C							COMMENTS
1/20	1255	X28SS0010006	SB001	0	0.5	SO	C	1	1		1								
1/20	1300	X28SS0010024	↓	0	2	SO	C	1	1		1								
1/20	1345	X28SS0020006	SB002	0	0.5	SO	C	1	1		1								
1/20	1350	X28SS0020024	↓	0	2	SO	C	1	1		1								
1/20	1400	X28SS0030006	SB003	0	0.5	SO	C	1	1		1								
1/20	1405	X28SS0030024	↓	0	2	SO	C	1	1		1								
1/20	1425	X28SS0080006	SB008	0	0.5	SO	C	1	1		1								
1/20	1425	X28SS0080024	↓	0	2	SO	C	1	1		1								
1/20	1445	X28SS0180006	SB018	0	0.5	SO	C	1	1		1								
1/20	1449	X28SS0180024	↓	0	2	SO	C	1	1		1								
1/20	1506	X28SS0190006	SB019	0	0.5	SO	C	1	1		1								
1/20	1510	X28SS0190024	↓	0	2	SO	C	1	1		1								
1/20	1523	X28SS0140006	SB014	0	0.5	SO	C	1	1		1								

1. RELINQUISHED BY: Terry Royal	DATE: 1/21/10	TIME: 1800	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 1/21/10	TIME: 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27360 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINGKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Terry Royal		T. ROSANN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB# 8631 2526 3882		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: EXPLOSIVES / METALS ZIP LOCK BAGS PH, CEC & TOC 8oz JAR								COMMENTS
											4°C	4°C							
1/20	1528	X28SS014 0024	SB014	0	2	SO	C	1	1										
1/20	1539	X28SS015 0006	SB015	0	0.5	SO	C	1	1										
1/20	1545	X28SS015 0024	↓	0	2	SO	C	1	1										
1/20	1603	X28SS009 0006	SB009	0	0.5	SO	C	1	1										
1/20	1610	X28SS009 0024	↓	0	2	SO	C	1	1										RUN MS/MSD
1/21	0812	X28SS006 0006	SB006	0	0.5	SO	C	1	1										
1/21	0818	X28SS006 0024	↓	0	2	SO	C	2	1	1									RUN MS/MSD
1/21	0915	X28SS007 0006	SB007	0	0.5	SO	C	1	1										
1/21	0920	X28SS007 0024	↓	0	2	SO	C	1	1										
1/21	0935	X28SS005 0006	SB005	0	0.5	SO	C	1	1										
1/21	0940	X28SS005 0024	↓	0	2	SO	C	1	1										
1/21	1000	X28SS010 0006	SB010	0	0.5	SO	C	1	1										
1/21	1005	X28SS010 0024	↓	0	2	SO	C	1	1										

1. RELINQUISHED BY: Terry Royal	DATE: 1/21/10	TIME: 1800	1. RECEIVED BY: FEDERAL EXPRESS	DATE: 1/21/10	TIME: 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27361 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER. / ANNA MILLKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Tony Rojahn		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB# 863125263882		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
									PRESERVATIVE USED			4°C	4°C	P	G			
									TYPE OF ANALYSIS	EXPLOSIVES / MetHs Ziplock BAGS	PH, SEC & TOC 8oz JAR							
1/21	1022	X28SS0110006	SB011	0	0.5	SO	C	1	1									
1/21	1025	X28SS0110024	↓	0	2	SO	C	1	1									
1/21	1043	X28SS0160006	SB016	0	0.5	SO	C	1	1									
1/21	1048	X28SS0160024	↓	0	2	SO	C	1	1									
1/21	1055	X28SS0130006	SB013	0	0.5	SO	C	1	1									
1/21	1102	X28SS0130024	↓	0	2	SO	C	1	1									
1/21	1110	X28SS0170006	SB017	0	0.5	SO	C	1	1									
1/21	1120	X28SS0170024	↓	0	2	SO	C	1	1									
1/21	1135	X28SS0120006	SB012	0	0.5	SO	C	1	1									
1/21	1140	X28SS0120024	↓	0	2	SO	C	1	1									
1/21	1200	X28SS0200006	SB020	0	0.5	SO	C	2	1	1								
1/21	1205	X28SS0200024	↓	0	2	SO	C	1	1									
1/21	1220	X28SS0040006	SB004	0	0.5	SO	C	2	1	1								

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Rojahn	1/21/10	1800	1. RECEIVED BY FEDERAL EXPRESS	1/21/10	1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 27362 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00810	NSF INDIAN HEAD	R. BASINSKI	(412) 921-8308	ANALYTICAL LAB SER / ANNA MILLIKEN
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Tony Rojahn		T. ROJAHN	(412) 921-8857	34 DOGWOOD LANE
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED. EX AB # 8631 2526 3882		MIDDLETOWN, PA

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2010)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)									COMMENTS
									A	G	P							
									PRESERVATIVE USED			4°C	4°C	4°C/HNO3				
									TYPE OF ANALYSIS: EXPLOSIVES/METALS PLASTIC ZIPLOCK BAGS; EXPLOSIVES 1L GLASS AMBER; TCLP METALS									
1/21	1225	X2855004002 4	SB004	0	2	SO	C	1	1									
1/21	1300	RB012110-01	QC	-	-	QC	G	3	-	2	1							
1/21	1310	WB012110-01	QC	-	-	QC	G	1	-	-	1							
1/21	0000	FD012110-01	QC	0 (FD)	~~2~~ 0.5	SO	C	1	1									
1/21	0000	FD012110-02	QC	0	0.5	SO	C	1	1									

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tony Rojahn	1/21/10	1800	1. RECEIVED BY FEDERAL EXPRESS	1/21/10	1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location:
QA Sample Type:

Sample ID Number: WB012110-01
Sampled By: T. ROSAHL
C.O.C. Number: 27362

[] Trip Blank
[■] Source Water Blank
[] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 1/21/10
Time: 1310
Method: Direct Pour into Bottle

WATER SOURCE:

[] Laboratory Prepared
[■] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL
Supplier: FIELD ENV.
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: NA
Equipment Used:
Equipment Type:
[] Dedicated
[] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / NO
Volatiles (for soil)	Cool 4°C	1 vial w/methanol and 2 vials w/ DI	YES / NO
Explosives	Cool 4°C	(2) 1 L Amber Glass	YES / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	YES / NO
			~~YES / NO~~ TR

OBSERVATIONS / NOTES:

Signature(s):

Tetra Tech NUS, Inc.

QA SAMPLE LOG SHEET

Project Site Name: INDIAN HEAD
Project Number: 112G00810
Sample Location:
QA Sample Type:

Sample ID Number: RB012110-01
Sampled By: T. ROJAHN
C.O.C. Number: 27362

[] Trip Blank
[] Source Water Blank
[X] Rinsate Blank
[] Other Blank

SAMPLING DATA:

Date: 1/21/10
Time: 1300
Method: POUR OVER HAND CORER

WATER SOURCE:

[] Laboratory Prepared
[X] Purchased
[] Other
[] Tap
[] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name: NERL
Supplier: FIELD ENV.
Manufacturer: NERL
Order Number: —
Lot Number: 1103239
Expiration Date: 11-2010

RINSATE INFORMATION (If Applicable):

Media Type: SOIL
Equipment Used: HAND CORER
Equipment Type:
[] Dedicated
[X] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Volatiles	Cool 4°C & HCl	(3) 40ml Vials w HCl	YES / ~~NO~~
Volatiles (for soil)	Cool 4°C	1 vial w/methanol and 2 vials w/ DI	YES / ~~NO~~
Explosives	Cool 4°C	(2) 1 L Amber Glass	~~YES~~ / NO
Metals	Cool 4°C & HNO_3	(1) 500ml HDPE	~~YES~~ / NO
			~~YES / NO~~ TR

OBSERVATIONS / NOTES:

Signature(s):

Tony Rojahn

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X285S001O006
Sample Location: X285B001
Sampled By: J. Birkett
C.O.C. No.: 27358

- [■] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1255	0-6"	Brown	asphalt gravel and F-C sand w some silt and large gravel moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Joel Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X285S0010024
Sample Location: X285B001
Sampled By: T. Rojahn
C.O.C. No.: 27358

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date: 1-20-10	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1300	0-24"	Brown	silty clay some asphalt gravel and F-M sand
Method: Hard core				tr. organics
				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jrad Bahlh

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X28SS0020006
Sample Location: X28SB002
Sampled By: JBirkett
C.O.C. No.: 27358

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1345	0-6"	Dark Brown	clayey silt w some organics (roots, grass) and Fine to medium asphalt gravel moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X28SS00200 24
Sample Location: X28SB002
Sampled By: T. Rojahn
C.O.C. No.: 23358 (FC)

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1350	0-24"	Brown to light brown	clayey silt Some asphalt small gravel tr. F. sand and roots moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)

Project No.: 112G00810, CTO 423

Sample ID No.: X28SS0030006
Sample Location: X28SB003
Sampled By: J. Birkett
C.O.C. No.: 27358

- [■] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1400	0-6"	Brown	clayey silt few gravel tr. F. sand and roots
Method: Hand Core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Typed for JB

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28SS0030024
Sample Location: X28SB003
Sampled By: T. Rojahn
C.O.C. No.: 27358

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1405	0-24"	Brown to light brown	clayey silt few asphalt gravel tr. F sand moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28SS008O006
Sample Location: X28SB008
Sampled By: J. Birkett
C.O.C. No.: 27358

- [■] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1425	0-6"	Brown	clayey silt few large gravel tr. F sand moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28S5008-0024
Sample Location: X28SB008
Sampled By: T. Reighn
C.O.C. No.: 27358

- [■] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1425	0-24"	Brown	clayey silt tr. F. sand and roots
Method:				moist
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD | Duplicate ID No.: _____

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X285S0180006
Sample Location: X285B018
Sampled By: J. Birkett
C.O.C. No.: 27358

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1445	0-6"	Light brown	clayey silt. tr. Fsand and organic (rootsandgrass) moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X2855018O024
Sample Location: X285B018
Sampled By: T. Rojahn
C.O.C. No.: 27358

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1449	0-24"	Light brown	clayey silt tr. F sand and roots moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD | Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28SS019 0006
Sample Location: X28SB019
Sampled By: J. Birkett
C.O.C. No.: 27358

- [■] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1506	0-6"	Brown	silt some F. Sand tr. roots, grass
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
✓	

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)

Project No.: 112G00810, CTO 423

Sample ID No.: X2855019C0024
Sample Location: X285B019
Sampled By: T. Rojahn
C.O.C. No.: 27358

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1510	0-24"	light brown	silty F. sand tr. organics (roots, grass) moist
Method: HAND CORE				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28SS0140006
Sample Location: X28SB014
Sampled By: J. Birkett
C.O.C. No.: 27358

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1523	0-6"	Brown	silty clay tr. F sand and roots moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Jarod Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Sample ID No.: X285S0140024
Sample Location: X285B014
Sampled By: T. Rojahn
C.O.C. No.: 27360

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-16	1528	0"-24"	Brown to light brown	Fine sand some silt tr organics (roots, twigs, etc) moist
Method: Hardcore				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28SS01500006
Sample Location: X28SB015
Sampled By: J Birkett
C.O.C. No.: 27360

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1539	0-6"	Brown to light brown	silty clay tr. F. sand and roots
Method:				wet
Hand core				
Monitor Readings				
(Range in ppm):				
NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jack Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)

Project No.: 112G00810, CTO 423

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X28550150024
Sample Location: X285B015
Sampled By: T. Rojahn
C.O.C. No.: 27368

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1545	0-24"	Brown	clay tr. f. sand few roots moist
Method: Hand Core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28550090006
Sample Location: X28SB009
Sampled By: JBirkett
C.O.C. No.: 27360

- [X] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1603	0"-6"	Brown	silt some sand tr. organics (roots, grass, etc) moist
Method: Handcore				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): JBirkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X285500900 24
Sample Location: X285B009
Sampled By: T. Rajahn
C.O.C. No.: 27360

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-20-10	1610	0-24"	Brown to light brown	Fine sand some silt tr. organics (roots, grass etc)
Method: Hand core				moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: _____

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28550060006
Sample Location: X2358006
Sampled By: J Birkett
C.O.C. No.: 27360

- [■] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	0812	0-6	Brown	F sand some silt (roots, grass)
Method: Hand core				Moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28SS00600024
Sample Location: X28SB006
Sampled By: J Birkett
C.O.C. No.: 27360

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	0818	0-24"	Brown	silt some F. sand tr roots moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD YES

Duplicate ID No.: FD-012110-01

Signature(s): Jarad Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X2855007006
Sample Location: X2358007
Sampled By: J Birkett
C.O.C. No.: 27360

- [X] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	0915	0-6"	Brown	clayey silt tr F sand and organics moist
Method: Hand corr				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Jarod Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X285S0070024
Sample Location: X285B007
Sampled By: T. Rojahn
C.O.C. No.: 27360

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	0920	0-24"	Brown	silt some F sand trace roots, twigs
Method: Hand corr				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Jared Bickell

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28S50050006
Sample Location: X28SB005
Sampled By: J Birkett
C.O.C. No.: 27360

- [■] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	0935	0-6"	Brown	F sand some silt/clay tr organics
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	✓	

OBSERVATIONS / NOTES:

Taken on depression in the middle of a berm. Some samples points were sloped and cores were taken semi-perpendicular to ground surface

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	FD-012110-02

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X2355050024
Sample Location: X235B05
Sampled By: T. Rojahn
C.O.C. No.: 27360

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	0940	0-24"	Brown to light brown	F sand some clay tr organics moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

More clay past 12" bgs

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD ~~Yes~~ (No)

Duplicate ID No.: —

Signature(s):

Jon Baird

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28SSG100006
Sample Location: X28SB010
Sampled By: J Birkett
C.O.C. No.: 27360

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1000	0-6"	Dark brown to brown	organic rich soil some F sand and clay
Method: Hand core				tr. pebbles
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD

Duplicate ID No.: —

Signature(s):

J Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X28550100024
Sample Location: X28SB010
Sampled By: T. Rojahn
C.O.C. No.: 27360

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1005	0-24"	dark brown to light brown	silty clay some F sand and organics moist to wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

Organich rich First 6" followed by silty clay

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD —

Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28SS01I0006
Sample Location: X28SB01I
Sampled By: J Birkett
C.O.C. No.: 27361

- [■] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1022	0-6"	Brown	silty F sand some clay and F. organics
Method: Hand corp				(roots, twigs) moist
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28550110024
Sample Location: X28SB011
Sampled By: J Birkett
C.O.C. No.: 27361

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1025	0-24"	Brown to light brown	silt some F sand and organics moist
Method: Hand Core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X28SS0160006
Sample Location: X28SB016
Sampled By: J Birkett
C.O.C. No.: 27361

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1043	0-6"	Brown	silty clay tr. F sand and organics
Method: Hand corg				moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Jonathan Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X2855016 0024
Sample Location: X285B016
Sampled By: T. Rajahn
C.O.C. No.: 27361

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1048	0-24"	Brown to light brown	silty clay tr organics moist to wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

David Barkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page 1 of 1

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)

Project No.: 112G00810, CTO 423

Sample ID No.: X28SS0130006
Sample Location: X28SB013
Sampled By: J Birkett
C.O.C. No.: 27361

- [■] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1055	0-6"	Brown	clayey silt some Fsand tr. organics moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s): Joan Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X285S0130024
Sample Location: X285B013
Sampled By: T. Rojahn
C.O.C. No.: 27361

- [■] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1102	0-24"	Brown	clayey silt some F sand tr pebbles (F-M) moist to wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X28550170006
Sample Location: X28SB017
Sampled By: J Birkett
C.O.C. No.: 27361

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1110	0-6"	Brown to light brown	clayey silt tr. F-M sand and roots moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X285S017O024
Sample Location: X285B017
Sampled By: T. Rajahn
C.O.C. No.: 27361

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1120	0-24"	Brown to light brown	clayey silt tr. F sand and organics moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar		

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD | Duplicate ID No.: —

Signature(s):

Jonathan Baker

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X285501200006
Sample Location: X285B012
Sampled By: J Birkett
C.O.C. No.: 27361

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1135	0-6"	Brown	silt some F sand tr. roots
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

Sample ID No.: X2355012 0024
Sample Location: X235B012
Sampled By: T. Rajahn
C.O.C. No.: 27361

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1140	0-24"	Brown to red-brown	clayey silt tr. F sand and roots moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

- [X] Surface Soil
- [] Subsurface Soil
- [] Sediment
- [] Other: _____
- [] QA Sample Type: _____

Sample ID No.: X2855020 0006
Sample Location: X285B020
Sampled By: J Birkett
C.O.C. No.: 27361

Type of Sample:
- [X] Low Concentration
- [] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1200	0-6"	Brown to light brown	clayey silt some F sand tr. roots moist to wet
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Jared Birkett

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Sample ID No.: X28550200024
Sample Location: X28SB020
Sampled By: T. Rojahn
C.O.C. No.: 27361

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1205	0-24"	Light brown	silty clay tr. F sand and organics
Method: Hand core				moist to wet
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Sample ID No.: X2355004 0006
Sample Location: X235B004
Sampled By: J Birkett
C.O.C. No.: 27361

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date: / Time: / Method: / Monitor Reading (ppm):	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1220	0-6"	Brown	silt some clay tr. f sand (some roots) moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	yes	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
EOD School Demolition Area (UXO 28)
Project No.: 112G00810, CTO 423

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other: _____
- [ ] QA Sample Type: _____

Sample ID No.: X28SS0040024
Sample Location: X28SB04
Sampled By: T. Rajahn
C.O.C. No.: 27362

Type of Sample:
- [X] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1-21-10	1225	0-24"	Brown to light brown	clayey silt tr. organics (roots, sticks) moist
Method: Hand core				
Monitor Readings (Range in ppm): NA				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Explosives/Metals	Zip Lock Bag	Yes	
pH, CEC and TOC	(1) 8oz Jar	—	

OBSERVATIONS / NOTES:

MAP:

SEE FIGURE 18.3

Circle if Applicable:

MS/MSD — Duplicate ID No.: —

Signature(s):

Jared Bukk

APPENDIX F.11

GROUNDWATER SAMPLE LOG SHEETS – UXO 02

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
112G00810, CTO 423

Project No.:
[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type: _____
[] QA Sample Type: _____

Sample ID No.: X02GW001
Sample Location: 25MW01
Sampled By: SBC
C.O.C. No.: 27400
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	NA
Date: 3-14-10								
Time: 1605								
Method: Low Flow								

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 3-14-10								
Method: Low-Flow								
Monitor Reading (ppm): -								
Well Casing Diameter & Material Type: 4" PVC								
			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 17.35								
Static Water Level (WL): 0.89								
One Casing Volume(gal/L):								
Start Purge (hrs): 1505								
End Purge (hrs): 1710								
Total Purge Time (min): 125								
Total Vol. Purged (gal/L): 3gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements		Collected
Explosives	4°C	4X	(2) L Glass Amber	✓
Total Metals	4°C/HNO_3	4X	(1) 500ml HDPE	✓
Dissolved Metals	4°C/HNO_3	4X	(1) 500ml HDPE	✓

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
Yes	FD031410-03

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSF Indian Head-Stump Neck Annex, Site 8 (UXO 02)
PROJECT NUMBER: 112G00810

WELL ID.: X02GW001
DATE: 3-14-10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)	ORP (mV)	Comments (Volume & Color)
1505	0.89	—	—	—	—	—	—	—	—	
1510	1.25	200	5.28	5	65	4.19	10.40	0.0	252	
1515	1.72	200	5.28	5	60	2.97	10.43	0.0	254	
1520	1.90	100	5.27	5	60	2.20	10.35	0.0	256	
1525	2.01	100	5.27	5	60	2.22	10.31	0.0	257	
1530	2.16	100	5.26	5	60	2.21	10.28	0.0	258	
1535	2.30	100	5.26	5	60	2.20	10.25	0.0	260	
1540	2.45	100	5.26	5	60	2.23	10.27	0.0	261	
1545	2.62	200	5.26	5	65	2.27	10.32	0.0	262	
1550	2.90	200	5.26	5	60	2.18	10.33	0.0	264	
1555	3.06	200	5.26	5	60	2.12	10.30	0.0	265	
1600	3.17	200	5.25	5	60	2.08	10.30	0.0	266	
1605	3.30	200	5.25	5	60	2.03	10.29	0.0	267	
	Sampling									

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type: _____
[] QA Sample Type: _____

Sample ID No.: X02GW002
Sample Location: 25MW02
Sampled By: SBC
C.O.C. No.: 27400
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-15-10	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1330	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	NA
Method: Low Flow	Clear	4.98	4	9.75	3.7	0.06	315	

PURGE DATA:

Date: 3-15-10	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 4" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 20.19								
Static Water Level (WL): 17.74								
One Casing Volume(gal/L):								
Start Purge (hrs): 1250								
End Purge (hrs): 1340								
Total Purge Time (min): 90								
Total Vol. Purged (gal/L): 7¾								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives	4°C	(2) L Glass Amber	Yes
Total Metals	4°C/HNO_3	(1) 500ml HDPE	Yes
Dissolved Metals	4°C/HNO_3	(1) 500ml HDPE	NO

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSF Indian Head-Stump Neck Annex, Site 8 (UXO 02) **WELL ID.:** X02GW002
PROJECT NUMBER: 112G00810 **DATE:** 3-15-10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)	ORP (mV)	Comments (Volume & Color)
1200	7.74	—	—	—	—	—	—	—	—	
1210	8.07	400	5.18	4	8.2	6.89	10.18	0.0	277	
1215	8.24	400	5.01	4	6.3	0.83	10.19	0.0	288	
1220	8.35	400	4.99	4	5.2	0.09	10.14	0.0	299	
1225	8.39	400	4.97	4	4.9	0.00	10.10	0.0	307	
1230	8.42	400	4.98	4	5.5	0.00	10.03	0.0	315	
1235	8.44	400	4.97	4	5.5	0.00	10.05	0.0	317	
1240	8.44	400	4.98	4	5.7	0.00	9.99	0.0	321	
1245	8.45	400	4.97	4	5.1	0.00	9.94	0.0	324	
1250	8.45	400	4.97	4	5.0	0.00	9.88	0.0	325	
1255	8.46	400	4.96	4	4.3	0.00	9.87	0.0	324	
1300	8.46	400	4.97	4	4.4	0.00	9.82	0.0	323	
1305	8.45	400	4.96	4	3.3	0.00	9.79	0.0	324	
1310	8.48	400	4.97	4	4.4	0.00	9.80	0.0	321	
1315	8.46	400	4.97	4	3.8	0.00	9.79	0.0	320	
1320	8.46	400	4.98	4	4.1	0.00	9.86	0.0	318	
1325	8.46	400	4.97	4	3.7	0.00	9.78	0.0	316	
1330	8.47	400	4.98	4	3.7	0.00	9.75	0.0	315	
	Sampling									

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type: _____
[] QA Sample Type: _____

Sample ID No.: X02GW003
Sample Location: 25MW03
Sampled By: SBC
C.O.C. No.: 27400
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-15-10	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	NA
Time: 1035								
Method: Low Flow	Clear	5.40	5	12.20	3.6	7.99	269	

PURGE DATA:

Date: 3-15-10	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 4" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 44.0								
Static Water Level (WL): 29.98								
One Casing Volume(gal/L):								
Start Purge (hrs): 0905								
End Purge (hrs): 1055								
Total Purge Time (min): 110								
Total Vol. Purged (gal/L): 7gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives	4°C	(2) L Glass Amber	Yes
Total Metals	4°C/HNO_3	(1) 500ml HDPE	Yes
Dissolved Metals	4°C/HNO_3	(1) 500ml HDPE	NO

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	NO

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSF Indian Head-Stump Neck Annex, Site 8 (UXO 02) **WELL ID.:** XO2GW003

PROJECT NUMBER: 112G00810 **DATE:** 3-15-10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)	ORP (mV)	Comments (Volume & Color)
0905	29.98	–	–	–	–	–	–	–	–	
0910	30.53	450	5.69	8	14	8.08	11.93	0.0	222	
0915	DC ~~31.55~~ 30.55	450	5.68	8	14	7.99	12.01	0.0	223	
0920	DC ~~30.69~~ 30.69	450	5.65	7	15	8.01	11.99	0.0	228	
0925	30.74	450	5.58	6	17	8.16	12.07	0.0	233	
0930	30.82	450	5.50	6	15	8.22	12.09	0.0	240	
0935	30.88	450	5.42	5	13	8.14	12.11	0.0	245	
0940	30.88	450	5.40	5	11	8.15	12.09	0.0	247	
0945	30.91	450	5.40	5	8	8.14	12.06	0.0	252	
0950	30.91	450	5.40	5	6.1	8.05	12.08	0.0	253	
0955	30.94	450	5.39	5	5.3	8.04	12.02	0.0	257	
1000	30.98	450	5.40	5	4.7	8.05	12.14	0.0	258	
1005	30.99	450	5.40	5	4.5	8.01	12.11	0.0	260	
1010	31.00	450	5.39	5	4.4	7.98	12.09	0.0	263	
1015	31.01	450	5.40	5	4.2	8.01	12.10	0.0	264	
1020	31.01	450	5.40	5	3.7	7.98	12.08	0.0	265	
1025	31.01	450	5.41	5	4.1	7.96	12.21	0.0	265	
1030	31.01	450	5.39	5	3.9	7.99	12.20	0.0	266	
1035	31.03	450	5.40	5	3.6	7.99	12.20	0.0	269	
	Sampling									

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)

Project No.: 112G00810, CTO 423

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type: _____
[] QA Sample Type: _____

Sample ID No.: X025W004
Sample Location: X025B032
Sampled By: SBC
C.O.C. No.: 27400
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-15-10	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1555	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	NA
Method: Low Flow	Clear	5.09	7	8.85	5.3	5.49	245	

PURGE DATA:

Date: 3-15-10	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 20.16								
Static Water Level (WL): ~~5.76~~ 5.67								
One Casing Volume(gal/L):								
Start Purge (hrs): 1425								
End Purge (hrs): 1605								
Total Purge Time (min): 100								
Total Vol. Purged (gal/L): 7.94								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives	4°C	(2) L Glass Amber	Yes
Total Metals	4°C/HNO_3	(1) 500ml HDPE	Yes
Dissolved Metals	4°C/HNO_3	(1) 500ml HDPE	No

OBSERVATIONS / NOTES:

Riser top was 2.8' above ground surface.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSF Indian Head-Stump Neck Annex, Site 8 (UXO 02)
PROJECT NUMBER: 112G00810

WELL ID.: X026W004
DATE: 3-15-10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)	ORP (mV)	Comments (Volume & Color)
1425	~~2016~~ 5.67	—	—	—	—	—	—	—	—	Developing
1430	5.84	400	5.22	7	~~27~~140	6.10	9.32	0.0	250	
1440	5.85	400	5.08	7	34	5.35	8.87	0.0	246	
1450	5.86	400	5.10	7	21	5.41	8.88	0.0	244	
1500	5.88	400	5.10	7	16	5.33	8.93	0.0	243	
1510	5.87	400	5.10	7	14	5.19	8.87	0.0	243	
1520	5.86	400	5.10	7	12	5.43	8.92	0.0	244	
1525	5.86	400	5.10	7	9.0	5.38	8.93	0.0	245	Begin Purging
1530	5.86	400	5.09	7	5.9	5.49	8.85	0.0	244	
1535	5.86	400	5.10	7	7.2	5.48	8.92	0.0	245	
1540	5.86	400	5.09	7	5.9	5.46	8.88	0.0	245	
1545	5.86	400	5.09	7	6.1	5.47	8.91	0.0	245	
1550	5.81	400	5.09	7	6.01	5.41	8.92	0.0	244	
1555	5.78	400	5.09	7	5.3	5.44	8.85	0.0	245	
	Sampling									

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
112G00810, CTO 423

Project No.:
[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: X02GW005
Sample Location: X02TW02 / X02SB029
Sampled By: SBC
C.O.C. No.: 27414
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-16-10	Color Visual	pH Standard	S.C. mS/cm	Temp. °C	Turbidity NTU	DO mg/l	ORP mV	Other NA
Time: 1000								
Method: Low Flow	Cloudy	5.37	6	9.48	120	0.00	82	

PURGE DATA:

Date: 3-16-10	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC								
Total Well Depth (TD): 15.12				See Low Flow Purge Data Sheets				
Static Water Level (WL): 3.51								
One Casing Volume(gal/L): 1.9								
Start Purge (hrs): 0810								
End Purge (hrs): 1025								
Total Purge Time (min): 135								
Total Vol. Purged (gal/L): 12								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives	4°C	(2) L Glass Amber	Yes
Total Metals	4°C/HNO_3	(1) 500ml HDPE	Yes
Dissolved Metals	4°C/HNO_3	(1) 500ml HDPE	Yes

OBSERVATIONS / NOTES:

River is 0.9' above ground surface. After purging Three Well volumes, the durbidity was still not below 10 NTUs. Samples were Collected at 120 NTUs

Circle if Applicable:

MS/MSD	Duplicate ID No.:
No	No

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSF Indian Head-Stump Neck Annex, Site 8 (UXO 02)
PROJECT NUMBER: 112G00810
WELL ID.: XO2 GW005
DATE: 3-16-10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)	ORP (mV)	Comments (Volume & Color)
0810	3.51	—	—	—	—	—	—	—	—	very cloudy (Developing)
0815	3.71	400	5.23	9	>1000	2.12	9.57	0.0	130	"
0825	3.71	400	5.36	6	>1000	0.00	9.21	0.0	126	"
0835	4.12	400	5.38	6	>1000	0.00	9.24	0.0	118	"
0845	4.31	400	5.38	6	>1000	0.00	9.26	0.0	113	"
0855	4.88	400	5.38	6	900	0.00	9.28	0.0	107	"
0905	4.72	400	5.37	6	600	0.00	9.32	0.0	101	cloudy
0915	4.87	400	5.35	6	450	0.00	9.35	0.0	97	"
0925	4.95	400	5.36	6	340	0.00	9.32	0.0	94	"
0930	4.97	400	5.36	6	290	0.00	9.32	0.0	92	" (begin purging)
0935	4.97	400	5.36	6	240	0.00	9.36	0.0	90	"
0940	4.76	400	5.36	6	200	0.00	9.35	0.0	88	"
0945	4.80	400	5.36	6	170	0.00	9.36	0.0	86	"
0950	4.90	400	5.36	6	200	0.00	9.38	0.0	85	"
0955	4.36	400	5.36	6	140	0.00	9.40	0.0	85	"
1000	4.15	400	5.37	6	120	0.00	9.48	0.0	82	"
	sampling									

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Area 8 (UXO 02)
Project No.: 112G00810, CTO 423

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type:
[] QA Sample Type:

Sample ID No.: X02GW006
Sample Location: X02TW03 / X02SB012
Sampled By: SBC
C.O.C. No.: 27414
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Date: 3-16-10	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	NA
Time: 1225								
Method: Low Flow	Clear	5.29	5	12.33	15	2.25	127	

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 3-16-10								
Method: Low Flow								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 2" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 22.61								
Static Water Level (WL): 2.50								
One Casing Volume(gal/L): 3.4kgl								
Start Purge (hrs): 1105								
End Purge (hrs): 1250								
Total Purge Time (min): 105								
Total Vol. Purged (gal/L): 12gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Explosives	4°C	(2) L Glass Amber	Yes
Total Metals	4°C/HNO_3	(1) 500ml HDPE	Yes
Dissolved Metals	4°C/HNO_3	(1) 500ml HDPE	Yes

OBSERVATIONS / NOTES:

Riser Top is 3.02' above the ground surface. Three well Volumes were reached SO sampling Commenced despite an NTU of 15.

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	
No	No	

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSF Indian Head-Stump Neck Annex, Site 8 (UXO 02)
PROJECT NUMBER: 112G00810

WELL ID.: XO2GW006
DATE: 3-16-10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)	ORP (mV)	Comments (Volume & Color)
1105	2.61/2.50	—	—	—	—	—	—	—	—	
1110	2.50	700	5.39	5	280	1.34	11.36	0.0	120	Developing
1120	2.54	500	5.33	5	400	0.92	11.77	0.0	118	cloudy
1130	2.56	500	5.30	5	120	1.98	12.16	0.0	119	very cloudy
1140	2.56	500	5.30	5	55	2.19	12.39	0.0	122	slightly cloudy
1150	2.56	500	5.30	5	33	2.22	12.48	0.0	123	clear
1155	2.56	500	5.29	5	27	2.32	12.44	0.0	124	clear
1200	2.56	500	5.28	5	20	2.47	12.41	0.0	126	begin Purging
1205	2.56	500	5.28	5	17	2.38	12.55	0.0	126	
1210	2.56	500	5.27	5	17	2.38	12.42	0.0	126	
1215	2.56	500	5.27	5	15	2.47	12.39	0.0	127	
1220	2.56	250	5.30	5	14	2.42	12.35	0.0	127	
1225	2.56	250	5.29	5	15	2.25	12.33	0.0	127	
	Sampling									

SIGNATURE(S):

APPENDIX F.12

GROUNDWATER SAMPLE LOG SHEETS – UXO 04

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic EID Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type: _____
[] QA Sample Type: _____

Sample ID No.: X04GW001
Sample Location: 26MW01
Sampled By: SBC
C.O.C. No.: 27397
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-14-10	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1335	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	NA
Method: Low Flow	Clear	4.91	47	10.24	5.9	0.00	320	

PURGE DATA:

Date: 3-14-10	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 4" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 12.31								
Static Water Level (WL): 7.77								
One Casing Volume(gal/L):								
Start Purge (hrs): 1235								
End Purge (hrs): 1355								
Total Purge Time (min): 80								
Total Vol. Purged (gal/L): 3 Sc/								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Appendix IX Volatiles	4°C/HCl	(3) 40ml Vails	Yes
Explosives	4°C	(2) L Glass Amber	Yes
Total Metals	4°C/HNO_3	(1) 500ml HDPE	Yes
Dissolved Metals	4°C/HNO_3	(1) 500ml HDPE	NO

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSF Indian Head-Stump Neck Annex, BEID Area (UXO 04) WELL ID.: X04GW00[redacted]1

PROJECT NUMBER: 112G00810 DATE: 3-14-10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)	ORP (mV)	Comments (Volume & Color)
1235	7.77	—	—	—	—	—	—	—	—	
1240	7.90	200	4.90	47	6.4	0.00	10.16	0.0	299	
1245	7.91	100	4.90	47	6.4	0.00	10.20	0.0	301	
1250	7.91	100	4.90	47	6.3	0.00	10.18	0.0	304	
1255	7.91	100	4.91	48	6.2	0.00	10.19	0.0	307	
1300	7.91	100	4.91	48	5.8	0.00	10.22	0.0	309	
1305	7.94	200	4.91	47	5.8	0.00	10.21	0.0	311	
1310	7.95	200	4.91	48	5.1	0.00	10.21	0.0	314	
1315	7.96	200	4.91	47	5.4	0.00	10.22	0.0	316	
1320	7.96	200	4.91	47	5.0	0.00	10.26	0.0	318	
1325	7.95	200	4.91	48	5.1	0.00	10.21	0.0	319	
1330	7.96	200	4.91	47	5.2	0.00	10.20	0.0	319	
1335	7.96	200	4.91	47	5.9	0.00	10.24	0.0	320	
	Sampling									

SIGNATURE(S): [signature]

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic EID Area (UXO 04)
Project No.: 112G00810, CTO 423

Sample ID No.: X04GW002
Sample Location: 26MW02
Sampled By: SBC
C.O.C. No.: 27397

[X] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	NA
Date: 3-14-10								
Time: 1025								
Method: Low Flow	Clear	4.85	12	10.40	3.1	2.64	304	

PURGE DATA:

	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Date: 3-14-10								
Method: Low Flow								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 4" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 23.88								
Static Water Level (WL): 4.01								
One Casing Volume(gal/L):								
Start Purge (hrs): 0934								
End Purge (hrs): 1130								
Total Purge Time (min): 114								
Total Vol. Purged (gal/L): 3.9								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Appendix IX Volatiles	4°C/HCl	4X (3) 40ml Vails	Yes
Explosives	4°C	4X (2) L Glass Amber	Yes
Total Metals	4°C/HNO_3	4X (1) 500ml HDPE	Yes
Dissolved Metals	4°C/HNO_3	4X (1) 500ml HDPE	NO

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
Yes	FD 031410-01

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSF Indian Head-Stump Neck Annex, BEID Area (UXO 04) **WELL ID.:** 26MW02
PROJECT NUMBER: 112G00810 **DATE:** 3-14-10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)	ORP (mV)	Comments (Volume & Color)
0928	4.01	—	—	—	—	—	—	—	—	—
0935	4.36	200	4.78	15	12	3.06	10.20	0.0	268	
0940	4.65	100	4.81	13	8.6	2.76	10.15	0.0	274	
0945	4.73	100	4.83	12	7.3	2.74	10.19	0.0	278	
0950	4.78	100	4.83	12	6.4	2.70	10.20	0.0	280	
0955	5.01	200	4.84	12	5.4	2.66	10.36	0.0	286	
1000	5.18	200	4.84	12	4.4	2.67	10.38	0.0	289	
1005	5.38	200	4.84	12	4.7	2.71	10.39	0.0	294	
1010	5.50	200	4.85	12	3.4	2.68	10.41	0.0	297	
1015	5.61	200	4.84	12	3.0	2.65	10.39	0.0	300	
1020	5.68	200	4.85	12	3.1	2.69	10.38	0.0	301	
1025	5.79	200	4.85	12	3.1	2.64	10.40	0.0	304	
Sampling										

SIGNATURE(S):

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NSF Indian Head-Stump Neck Annex
Basic EID Area (UXO 04)

Project No.: 112G00810, CTO 423

[] Domestic Well Data
[X] Monitoring Well Data
[] Other Well Type: _____
[] QA Sample Type: _____

Sample ID No.: X04GW003
Sample Location: 26 MW03
Sampled By: SBC
C.O.C. No.: 27397
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

Date: 3-13-10	Color	pH	S.C.	Temp.	Turbidity	DO	ORP	Other
Time: 1710	Visual	Standard	mS/cm	°C	NTU	mg/l	mV	NA
Method: Low Flow	Clear	5.12	7	10.38	60	8.40	273	

PURGE DATA:

Date: 3-13-10	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow								
Monitor Reading (ppm): —								
Well Casing Diameter & Material Type: 4" PVC			See Low Flow Purge Data Sheets					
Total Well Depth (TD): 20.25								
Static Water Level (WL): 3.12								
One Casing Volume(gal/L):								
Start Purge (hrs): 1610								
End Purge (hrs): 1745								
Total Purge Time (min): 95								
Total Vol. Purged (gal/L): 3gal								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Appendix IX Volatiles	4°C/HCl	(3) 40ml Vails	Yes
Explosives	4°C	(2) L Glass Amber	Yes
Total Metals	4°C/HNO_3	(1) 500ml HDPE	Yes
Dissolved Metals X04GW003-F	4°C/HNO_3	(1) 500ml HDPE	~~NO~~ YES

OBSERVATIONS / NOTES:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
NO	NO

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NSF Indian Head-Stump Neck Annex, BEID Area (UXO 04)
PROJECT NUMBER: 112G00810
WELL ID.: X04GW003
DATE: 3-B-10

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	Salinity (%)	ORP (mV)	Comments (Volume & Color)
1610	3.12	300	5.14	7	70	9.66	10.61	0.0	236	
1615	3.50	150	5.03	7	70	8.83	10.47	0.0	236	
1620	3.52	150	4.99	7	70	8.74	10.54	0.0	257	
1625	3.53	150	5.12	7	70	8.61	10.62	0.0	258	
1630	3.54	150	5.12	7	70	8.56	10.60	0.0	260	
1635	3.55	150	5.12	7	65	8.46	10.52	0.0	263	
1640	3.56	150	5.09	7	65	8.41	10.48	0.0	265	
1645	3.57	150	5.14	7	65	8.44	10.51	0.0	267	
1650	3.59	150	5.14	7	65	8.44	10.58	0.0	268	
1655	3.59	150	5.13	7	60	8.45	10.62	0.0	269	
1700	3.59	150	5.13	7	60	8.44	10.50	0.0	270	
1705	3.59	150	5.13	7	60	8.40	10.39	0.0	272	
1710	3.59	150	5.12	7	60	8.40	10.38	0.0	273	
	Sampling									

SIGNATURE(S):

APPENDIX F.13

BACKGROUND HYDROGEOLOGY INFORMATION

019630/P

VERIFICATION INVESTIGATION REPORT
FOR
THE NAVAL SCHOOL EOD SITES
AT
THE NAVAL EXPLOSIVE ORDNANCE DISPOSAL TECHNOLOGY DIVISION
NAVAL SURFACE WARFARE CENTER
STUMP NECK ANNEX, INDIAN HEAD DIVISION
INDIAN HEAD, MARYLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Engineering Field Activity Chesapeake
Environmental Branch Code 18
Naval Facilities Engineering Command
Washington Navy Yard, Building 212
Washington, D.C. 20374-2121

Submitted by:
Brown & Root Environmental
993 Old Eagle School Road, Suite 415
Wayne, Pennsylvania 19087-1710

CONTRACT NUMBER N62472-90-D-1298
CONTRACT TASK ORDER 222

FEBRUARY 1996

PREPARED BY:

LEE ANN SINAGOGA
PROJECT MANAGER
BROWN & ROOT ENVIRONMENTAL
PITTSBURGH, PENNSYLVANIA

APPROVED BY:

JOHN J. TREPANOWSKI, P.E.
PROGRAM MANAGER
BROWN & ROOT ENVIRONMENTAL
WAYNE, PENNSYLVANIA

Well Name	Elevation of Measuring Point (ft. MSL)	Depth to Groundwater (ft.)	Groundwater Elevation (ft. MSL)
25MW01	6.24	2.13	4.11
25MW02	24.66	10.79	13.87
25MW03	74.17	34.91	39.26

Both rising and falling head slug tests were performed at monitoring wells 25MW01 and 25MW03 and a rising head slug test was performed at monitoring well 25MW02 to determine the permeability characteristics of the aquifer.

7.4.4 Surface Water and Sediment Samples

Four surface water and sediment samples were collected at Area 8. One set of surface water and sediment samples (S25-SW001, S25-SD001) was collected from water-shot location 7-B. A second set of surface water and sediment samples (S25-SW002, S25-SD002) was collected from water-shot location 23-B. These are considered by Base personnel to be among the most used water-shot locations. A third set of surface water and sediment samples (S25-SW003, S25-SD003) was collected from Chicamuxen Creek adjacent to water-shot location 7-A. The fourth set of surface water and sediment samples (S25-SW004, S25-SD004) was collected from Chicamuxen Creek, upstream of all air-shot and water-shot locations (see Figure 7-1 for all sediment sample locations). Field test-kit analyses were performed on surface water and sediment samples S25-SW/SD001, S25-SW/SD002, and S25-SW/SD003. All four sets of surface water and sediment samples were analyzed at a fixed-base laboratory for the parameters listed in Table 2-1.

7.5 SITE CHARACTERISTICS

This section discusses the site-specific geology and hydrogeology for Area 8.

7.5.1 Geology and Soils

Subsurface soil was classified in the field for three soil borings and three monitoring well borings drilled at the site. The information was used to classify the site geologic conditions.

The shallow subsurface geology of the study area, as observed from the boring logs, consisted of silty sand with clay. The relative amounts of sand, silt, and clay vary somewhat at each location.

7.5.2 Hydrogeology

Hydrogeological conditions at Area 8 have been interpreted from data obtained during the field investigation activities.

The site is characterized by a shallow groundwater table (ranging from 0 to 30 feet below ground surface), contained within a silty sand with clay aquifer. The presence of significant amounts of fine sediments resulted in a high turbidity in all three monitoring wells installed at Area 8. Recharge of the shallow aquifer is likely to occur primarily through infiltration of precipitation.

The potentiometric surface map generated from water levels collected on October 17, 1995, was used to determine the groundwater flow direction and gradient across the site. Based on the potentiometric surface map (Figure 7-3), groundwater flows to the northwest across the site toward the nearby wetlands. Based on linear measurements perpendicular to the potentiometric surface contours, the groundwater gradient was calculated to be approximately 0.047.

Both rising- and falling-head slug tests were performed in the monitoring wells to determine the permeability characteristics of the aquifer. As shown in the following table, the average hydraulic conductivity for the site was calculated to be approximately 1.47 ft/day (5.20×10^{-4} centimeters per second [cm/sec]).

SUMMARY OF SLUG TEST DATA

Well Number	Rising-Head Slug Test (cm/sec)	Falling-Head Slug Test (cm/sec)	Average (cm/sec)
25MW01	2.34×10^{-5}	3.44×10^{-5}	2.84×10^{-5}
25MW02	1.68×10^{-3}		1.68×10^{-3}
25MW03	3.21×10^{-3}	2.71×10^{-3}	2.95×10^{-3}
Site Average			5.20×10^{-4}

Assuming an effective aquifer porosity of 30 percent and using the calculated potentiometric surface gradient of 0.047, the groundwater velocity is calculated to be 84 feet per year. Hydraulic conductivity test data plots and calculations based on the slug tests are included in Appendix G.

SB004 – saturated at surface (eliminated)

3

P:\GIS\INDIANHEAD_NSWC_NEW\MXD\SN_AREA_8_SAMPLING.MXD 1/29/10 KM

1250000 1251000 1252000

322000 321000

N

Archer Avenue

Marshall Avenue

Roach Road

Chicamuxen Creek

slope/stream may require hand sampling

Toy restrictions

Birds Hand Only

Work may have to be done from wetlands/access

TWO3

TWO2

TWO1

X02SB001 X02SB002 X02SB003 X02SB004 X02SB005 X02SB006 X02SB007 X02SB008 X02SB009 X02SB010 X02SB011 X02SB012 X02SB013 X02SB014 X02SB015 X02SB016 X02SB017 X02SB018 X02SB019 X02SB020 X02SB021 X02SB022 X02SB023 X02SB024 X02SB025 X02SB026 X02SB027 X02SB028 X02SB029 X02SB030 X02SB031 X02SB032 X02SB033 X02SB034 X02SB035 X02SB036 X02SB037 X02SB038 X02SB039 X02SB040

X02SD001 X02SD002 X02SD003 X02SD004 X02SD005 X02SD006 X02SD007

25MW01 25MW02 25MW03

Legend

COLOCATE WELLS

Soil Sample Location

LOC_TYPE

SB033

SB022

SB18

- Sediment Sample Location
- Soil Sample Location
- Monitoring Well
- Installation Boundary
- MRP Area Boundary Identified during PA
- Contour (5 ft)
- Wetland

Aerial Photo: 2004, Charles County
NAD 1983 SP Maryland (coordinates in feet)

200 100 0 200 Feet

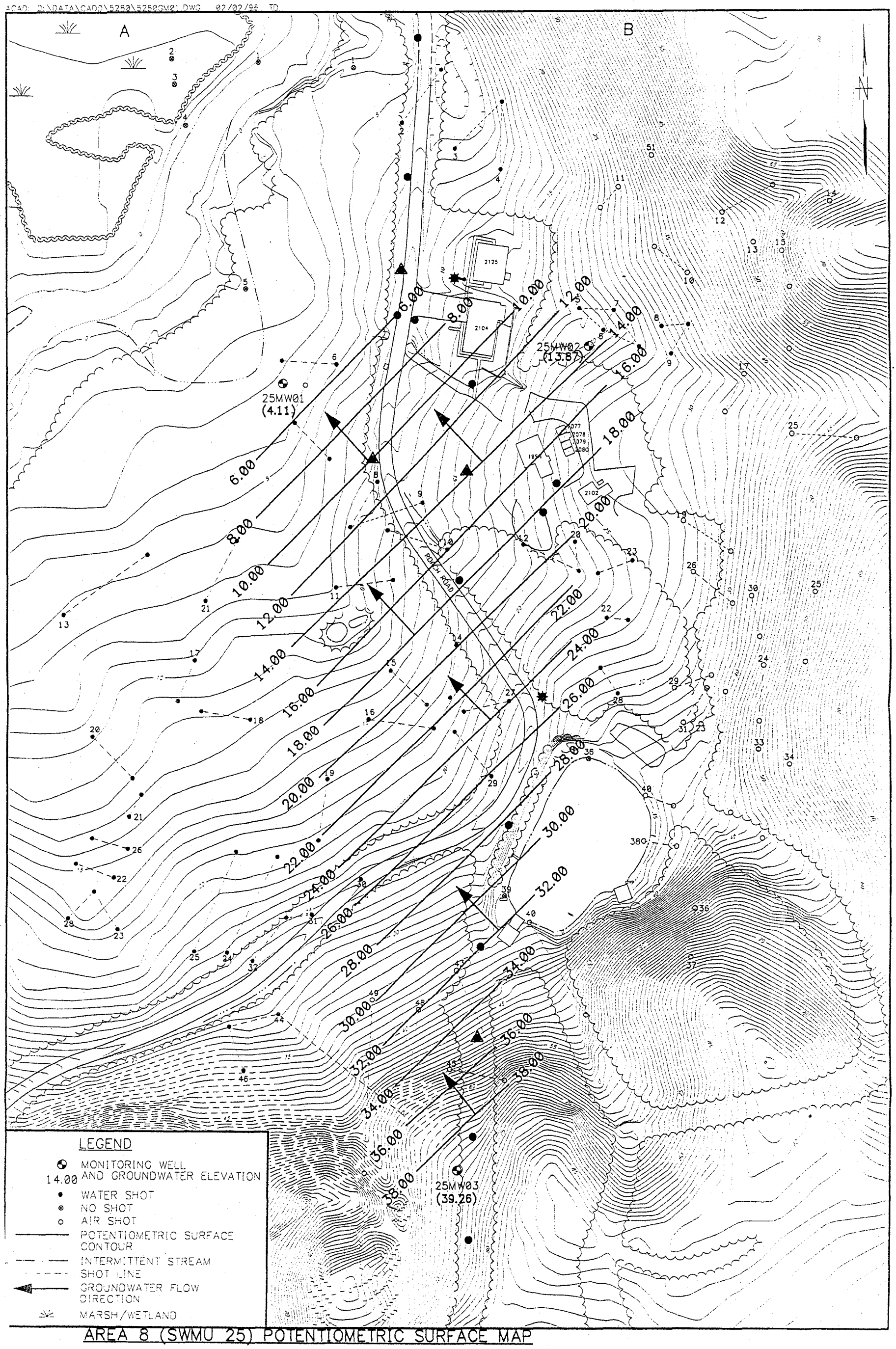
DRAWN BY	DATE
K. MOORE	1/29/10
CHECKED BY	DATE
E. BERKLITE	1/29/10
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

AREA 8
SAMPLE LOCATION MAP
NAVAL SUPPORT FACILITY INDIAN HEAD
STUMP NECK ANNEX
INDIAN HEAD, MARYLAND

CONTRACT NUMBER	N62467-04-D-0055
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE	0

ACAD: D:\DATA\CADD\5280\5280SW01.DWG 02/02/96 TD



AREA 8 (SWMU 25) POTENTIOMETRIC SURFACE MAP
STUMP NECK ANNEX
NAVAL SURFACE WARFARE CENTER
INDIAN HEAD, MARYLAND

FIGURE 7-3

Brown & Root Environmental

CTO 222

APPENDIX F.14

MONITORING WELL INSPECTION SHEETS

MONITORING WELL INSPECTION SHEET

Well ID: 26MW01 (BASIC IED)

Time: 1410 **Date:** 3-12-10 **Inspector's Name: Terry Rojahn**

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible		✓	No permanent well tag...only marker or paint
Well security	Condition protective case, cap, lock	✓		Replaced rusted lock with keyed a like lock supplied by POC
Well pad	Concrete or gravel & condition	✓		Concrete
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	→	→	~1" standing H2O
Dedicated sampling equipment	Condition of...	NA		None
PVC Riser	Condition of riser & survey reference point	✓		4" PVC Riser

Comments:

TD = 17.4'
Steel Protective casing and 4 Ballards

Signature(s) Terry Rojahn

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

NSB-NLON
Field Form
Revision: 1
January: 1999

MONITORING WELL INSPECTION SHEET

Well ID: 26MW02 (BASIC IED)

Time: 1630 **Date:** 3-12-10 **Inspector's Name: Terry Rojahn**

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible		✓	No permanent well tag...only marker or paint
Well security	Condition protective case, cap, lock	✓		Replaced rusted lock with keyed a like lock supplied by POC
Well pad	Concrete or gravel & condition	✓		Concrete
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	→		some standing water
Dedicated sampling equipment	Condition of...	NA		None
PVC Riser	Condition of riser & survey reference point	✓		4" PVC Riser

Comments:

TD = 24.0'
Steel Protective casing and 4 Ballards

Signature(s) Terry Rojahn

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

NSB-NLON
Field Form
Revision: 1
January: 1999

MONITORING WELL INSPECTION SHEET

Well ID: 26MW03 (BASIC IED)

Time: 1115 **Date:** 3-11-10 **Inspector's Name: Terry Rojahn**

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible		✓	No permanent well tag...only marker or paint
Well security	Condition protective case, cap, lock	✓		Replaced rusted lock with keyed a like lock supplied by POC
Well pad	Concrete or gravel & condition	✓		Concrete 3 CORNERS BROKEN @ / AROUND THE BALLARDS
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	✓		NONE
Dedicated sampling equipment	Condition of...	NA		None
PVC Riser	Condition of riser & survey reference point	✓		4" PVC Riser

Comments:

TD = 20.25'
Steel Protective casing and 4 Ballards

Signature(s) Terry Rojahn

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

NSB-NLON
Field Form
Revision: 1
January: 1999

MONITORING WELL INSPECTION SHEET

Well ID: 25MW01 (AREA 8)

Time: 1022 **Date:** 3-13-10 **Inspector's Name: Terry Rojahn**

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible		✓	No permanent well tag...only marker or paint
Well security	Condition protective case, cap, lock	✓		Replaced rusted lock with keyed a like lock supplied by POC
Well pad	Concrete or gravel & condition	✓		Concrete
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	→		BRACKISH H2O WITHIN 12' OF PAD
Dedicated sampling equipment	Condition of...	NA		None
PVC Riser	Condition of riser & survey reference point	✓		4" PVC Riser

Comments:

TD = 17.35'
Steel Protective casing and 4 Ballards

Signature(s) Terry Rojahn

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

NSB-NLON
Field Form
Revision: 1
January: 1999

MONITORING WELL INSPECTION SHEET

Well ID: 25MW02 (AREA 8)

Time: 1348 **Date:** 3/13/10 **Inspector's Name: Terry Rojahn**

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible		✓	No permanent well tag...only marker or paint
Well security	Condition protective case, cap, lock	✓		Replaced rusted lock with keyed a like lock supplied by POC
Well pad	Concrete or gravel & condition	✓		Concrete
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	✓		NONE
Dedicated sampling equipment	Condition of...	NA		None
PVC Riser	Condition of riser & survey reference point	✓		4" PVC Riser

Comments:

TD = 20.19
Steel Protective casing and 4 Ballards

Signature(s) Terry Rojahn

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

NSB-NLON
Field Form
Revision: 1
January: 1999

MONITORING WELL INSPECTION SHEET

Well ID: 25MW03 (AREA 8)

Time: 0844 **Date:** 3-13-10 **Inspector's Name: Terry Rojahn**

Inspection Item	Types of Problems	Status		Observation
		S	U	
Well Tag	Is it in-place, legible		✓	No permanent well tag...only marker or paint
Well security	Condition protective case, cap, lock		✓	Replaced rusted lock with keyed a like lock supplied by POC / HING BROKEN!!!
Well pad	Concrete or gravel & condition	✓		Concrete
Well seal	Condition of...	✓		
Area Immediately around well pad	Record any evidence of/or standing water in area of well	✓		NONE
Dedicated sampling equipment	Condition of...	NA		None
PVC Riser	Condition of riser & survey reference point	✓		4" PVC Riser

Comments:

TD = 440'
Steel Protective casing and 4 Ballards

Signature(s) Terry Rojahn

Note: S= Satisfactory, U= Unsatisfactory
Check one, if unsatisfactory explain

APPENDIX F.15

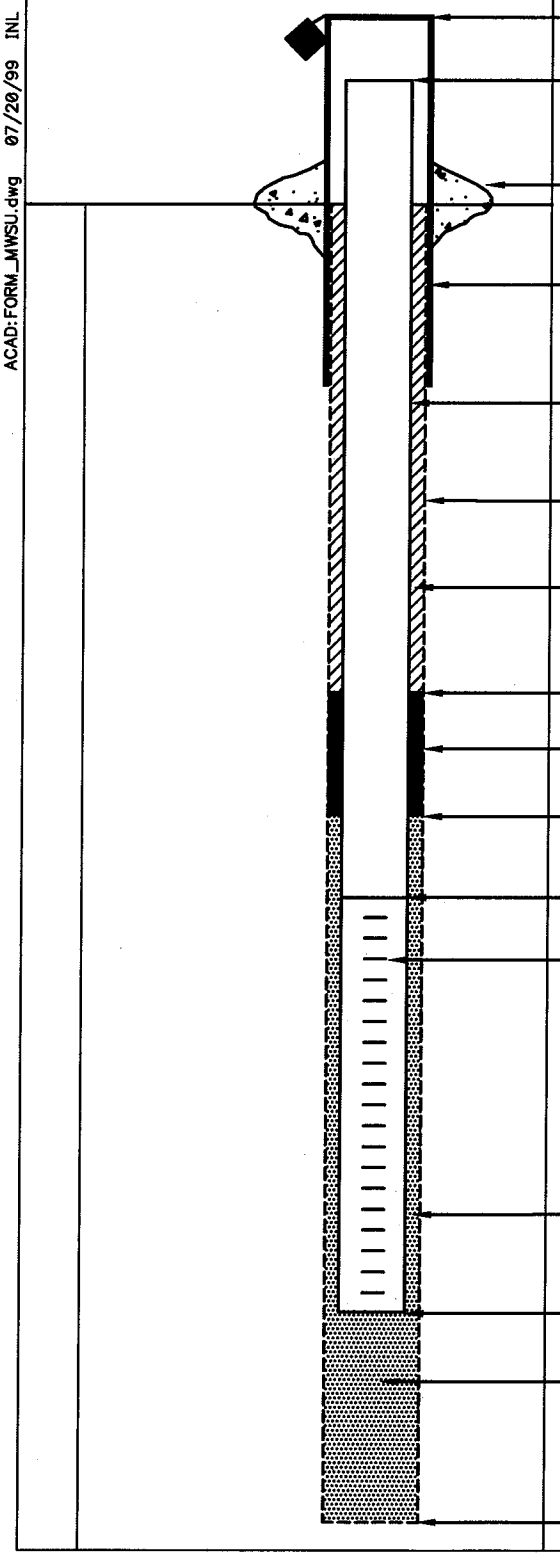
MONITORING WELL SCHEMATICS

WELL NO.: X02TW01 / X02GW004

Tetra Tech NUS, Inc.

OVERBURDEN MONITORING WELL SHEET STICK-UP

PROJECT Ten Munitions Sites	LOCATION NSF Indian Head, Maryland	DRILLER Vironex
PROJECT NO. 112G00810	BORING X02SB032	DRILLING METHOD DPT
DATE BEGUN 3-13-10	DATE COMPLETED 3-13-10	
FIELD GEOLOGIST Ellen Berklite		DEVELOPMENT METHOD Low-Flow Purging
GROUND ELEVATION	DATUM	



ELEVATION/HEIGHT OF TOP OF SURFACE CASING: NA / 3'

ELEVATION/HEIGHT OF TOP OF RISER PIPE: / 2.8'

TYPE OF SURFACE SEAL: Bentonite Pellets 0.0'

I.D. OF SURFACE CASING: NA

TYPE OF SURFACE CASING: NA

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: PVC

BOREHOLE DIAMETER: 8"

TYPE OF BACKFILL: Bentonite Pellets

ELEVATION/DEPTH TOP OF SEAL: NA /

TYPE OF SEAL: Bentonite Pellets

DEPTH TOP OF SAND PACK: 5.36'

ELEVATION/DEPTH TOP OF SCREEN: / 7.36'

TYPE OF SCREEN: PVC

SLOT SIZE x LENGTH: .010" x 10'

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: No.1 - 20/40

ELEVATION/DEPTH BOTTOM OF SCREEN: / 17.36'

ELEVATION/DEPTH BOTTOM OF SAND PACK: /

BACKFILL MATERIAL BELOW SAND:

ELEVATION/DEPTH OF HOLE: ~18'

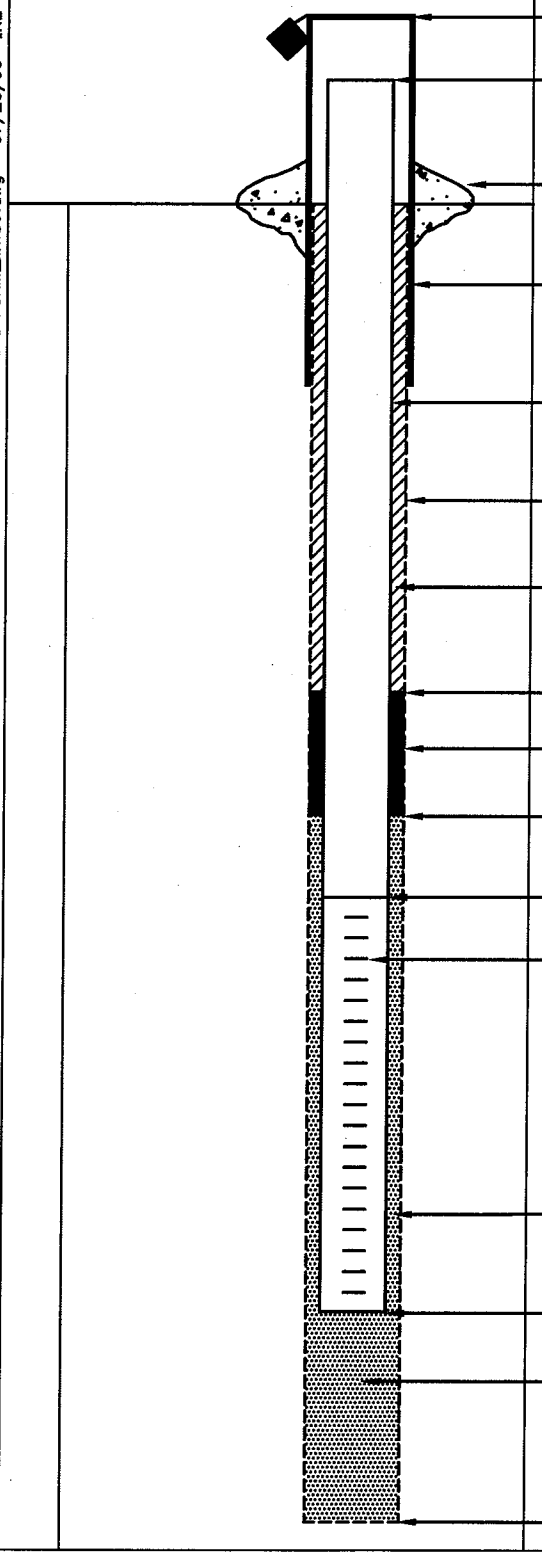
ACAD:FORM_MWSU.dwg 07/20/99 INL

WELL NO.: X02TW02/ X02GW005

Tetra Tech NUS, Inc.

OVERBURDEN MONITORING WELL SHEET STICK-UP

PROJECT Ten Munitions Sites	LOCATION NSF Indian Head, Maryland	DRILLER Vironex	
PROJECT NO. 112600910	BORING X02SB029	DRILLING METHOD DPT	
DATE BEGUN 3-13-10	DATE COMPLETED 3-13-10		
FIELD GEOLOGIST Ellen Berkfite		DEVELOPMENT METHOD Low-Flow Purging	
GROUND ELEVATION	DATUM		



ELEVATION/HEIGHT OF TOP OF SURFACE CASING: NA/

ELEVATION/HEIGHT OF TOP OF RISER PIPE: +0.9'

TYPE OF SURFACE SEAL: Bentonite Pellets 0.0'

I.D. OF SURFACE CASING: NA

TYPE OF SURFACE CASING: NA

RISER PIPE I.D.: 2"

TYPE OF RISER PIPE: PVC

BOREHOLE DIAMETER: 8"

TYPE OF BACKFILL: Bentonite Pellets

ELEVATION/DEPTH TOP OF SEAL: NA/

TYPE OF SEAL: Bentonite Pellets

DEPTH TOP OF SAND PACK: 2.22'

ELEVATION/DEPTH TOP OF SCREEN: +4.22'

TYPE OF SCREEN: PVC

SLOT SIZE x LENGTH: .010" x 10'

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: No.1 - 20/40

ELEVATION/DEPTH BOTTOM OF SCREEN: -14.22'

ELEVATION/DEPTH BOTTOM OF SAND PACK: /

BACKFILL MATERIAL BELOW SAND:

ELEVATION/DEPTH OF HOLE: ~15'

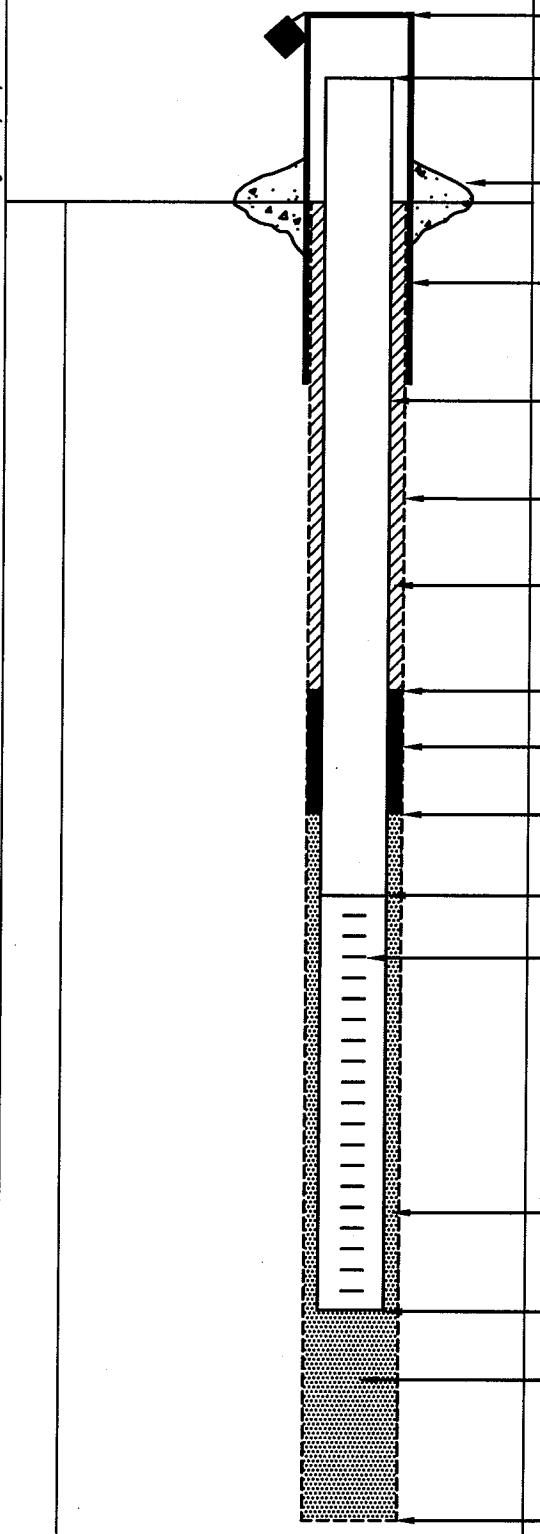
ACAD:FORM_MWSU.dwg 07/20/99 INL

WELL NO.: X02TW03
X02GW006

Tetra Tech NUS, Inc.

OVERBURDEN
MONITORING WELL SHEET
STICK-UP

PROJECT Ten Munitions Sites	LOCATION NSF Indian Head, Maryland	DRILLER Vironex
PROJECT NO. 112G00810	BORING X02SB012	DRILLING METHOD DPT
DATE BEGUN 3-13-10	DATE COMPLETED 3-13-10	
FIELD GEOLOGIST Ellen Berkfire		DEVELOPMENT METHOD Low Flow Purging
GROUND ELEVATION	DATUM	



ELEVATION/HEIGHT OF TOP OF SURFACE CASING: NA/

ELEVATION/HEIGHT OF TOP OF RISER PIPE: /3.2'

TYPE OF SURFACE SEAL: Bentonite Pellets 0.0'

I.D. OF SURFACE CASING: NA
TYPE OF SURFACE CASING: NA

RISER PIPE I.D.: 2"
TYPE OF RISER PIPE: PVC

BOREHOLE DIAMETER: 8"

TYPE OF BACKFILL: Bentonite Pellets

ELEVATION/DEPTH TOP OF SEAL: NA

TYPE OF SEAL: Bentonite Pellets

DEPTH TOP OF SAND PACK: 7.41'

ELEVATION/DEPTH TOP OF SCREEN: /9.41'

TYPE OF SCREEN: PVC

SLOT SIZE x LENGTH: .010" X 10'

I.D. OF SCREEN: 2"

TYPE OF SAND PACK: No.1 - 20/40

ELEVATION/DEPTH BOTTOM OF SCREEN: /19.41'

ELEVATION/DEPTH BOTTOM OF SAND PACK: /
BACKFILL MATERIAL BELOW SAND:

ELEVATION/DEPTH OF HOLE: 20'

ACAD:FORM_MWSU.dwg 07/20/99 INL

APPENDIX F.16

PID CALIBRATION LOGS

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: PID/ 2020PRO

MANUFACTURER: PHOTO VAC, INC

SERIAL NUMBER: 451006X

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
3/16/10	SAME	TR	—	—	100	100	09-3732	Fill Dirs 8/12/09
3/17/10	"	TR	—	—	88.7	100	"	EXP DATE 2/12/11

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: PID/

MANUFACTURER:

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: PID/

MANUFACTURER:

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: PID/

MANUFACTURER:

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: PID/

MANUFACTURER:

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: PID/

MANUFACTURER:

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

APPENDIX F.17

WATER METER CALIBRATION LOGS

Tetra Tech NUS, Inc.

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munitions Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: Horiba / ~~U-22~~ U-2000

MANUFACTURER: Horiba

SERIAL NUMBER: T111019

Date of Calibration	Person Performing Calibration	S/m INITIAL READINGS PH (S.U.)	COND (~~mS/cm~~)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt	S/m FINAL READINGS PH (S.U.)	COND (~~mS/cm~~)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt	Calibration Standard (Lot No.)	Remarks and Comments
3/12/10	TR/SC	3.90	0.45	9.45	232	15.66	0.2	4.00	0.45	10.05	~~156~~ 233	15.66	0.2	NOT GIVEN	BY VENDOR
3/13/10	TR	3.99	0.43	10.33	232	12.45	0.2	4.00	0.45	10.81	232	12.48	0.2		
3/14/10	TR	3.96	0.43	10.02	328	12.55	0.2	4.00	0.45	10.56	330	12.54	0.2		
3/15/10	TR	3.99	0.46	10.72	344	11.53	0.2	4.00	0.45	10.22	345	11.56	0.2		
3/16/10	TR	4.00	0.44	10.97	359	10.26	0.2	4.00	0.46	11.49	361	10.31	0.2		
3/18/10	TR	4.03	0.46	11.16	324	17.00	0.2	4.00	0.45	9.70	324	16.95	0.2		

Tetra Tech NUS, Inc.

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munitions Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: Horiba / U-22

MANUFACTURER: Horiba

SERIAL NUMBER:

Date of Calibration	Person Performing Calibration	INITIAL READINGS						FINAL READINGS						Calibration Standard (Lot No.)	Remarks and Comments
		PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt	PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt		

Tetra Tech NUS, Inc.

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munitions Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: Horiba / U-22

MANUFACTURER: Horiba

SERIAL NUMBER:

Date of Calibration	Person Performing Calibration	INITIAL READINGS						FINAL READINGS						Calibration Standard (Lot No.)	Remarks and Comments
		PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt	PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt		

Tetra Tech NUS, Inc.

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munitions Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: Horiba / U-22

MANUFACTURER: Horiba

SERIAL NUMBER:

Date of Calibration	Person Performing Calibration	INITIAL READINGS						FINAL READINGS						Calibration Standard (Lot No.)	Remarks and Comments
		PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt	PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt		

Tetra Tech NUS, Inc.

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munitions Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: Horiba / U-22

MANUFACTURER: Horiba

SERIAL NUMBER:

Date of Calibration	Person Performing Calibration	INITIAL READINGS						FINAL READINGS						Calibration Standard (Lot No.)	Remarks and Comments
		PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt	PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt		

Tetra Tech NUS, Inc.

WATER QUALITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munitions Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: Horiba / U-22

MANUFACTURER: Horiba

SERIAL NUMBER:

Date of Calibration	Person Performing Calibration	INITIAL READINGS						FINAL READINGS						Calibration Standard (Lot No.)	Remarks and Comments
		PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt	PH (S.U.)	COND (mS/cm)	DO (mg/L)	ORP (mV)	TEMP (°C)	SAL % or ppt		

APPENDIX F.18

TURBIDITY METER CALIBRATION LOGS

Tetra Tech NUS, Inc.

TURBIDITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: LaMotte 2020

MANUFACTURER: LaMotte

SERIAL NUMBER: 3542-3302

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	[] 0 or [] 1 NTUs		10 NTUs		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
3/12/10	3542-3302	TR	1.2	1.0	9.2	10.0	1.0 =	GFS# 9184-P891441
								EXP MAY 2010
							10.0	GFS# 8184-P890791
3/13/10	"	TR	1.1	1.0	9.4	10.0		EXP MAY 2010
3/14/10	"	TR	0.94	1.0	12	10.0		
3/15/10	"	TR	0.92	1.0	9.1	10.0		
3/16/10	"	TR	0.92	1.0	9.89	10.0		
3/18/10	"	TR	0.90	1.0	9.2	10.0		

Tetra Tech NUS, Inc.

TURBIDITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: LaMotte 2020

MANUFACTURER: LaMotte

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	[] 0 or [] 1 NTUs		10 NTUs		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

Tetra Tech NUS, Inc.

TURBIDITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: LaMotte 2020

MANUFACTURER: LaMotte

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	[] 0 or [] 1 NTUs		10 NTUs		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

Tetra Tech NUS, Inc.

TURBIDITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: LaMotte 2020

MANUFACTURER: LaMotte

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	[] 0 or [] 1 NTUs		10 NTUs		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

Tetra Tech NUS, Inc.

TURBIDITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: LaMotte 2020

MANUFACTURER: LaMotte

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	[] 0 or [] 1 NTUs		10 NTUs		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

Tetra Tech NUS, Inc.

TURBIDITY METER CALIBRATION LOG

PROJECT NAME : NSF INDIAN HEAD

SITE NAME: Nine Munition Sites

PROJECT No.: 112G00810

INSTRUMENT NAME/MODEL: LaMotte 2020

MANUFACTURER: LaMotte

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	[] 0 or [] 1 NTUs		10 NTUs		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		

APPENDIX F.19

WELL DEVELOPMENT LOGS

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 25MW01
Site: AREA 8
Date Installed: UNKNOWN
Date Developed: 3/13/10
Dev. Method: WATTERRIA
Pump Type: PERISTALTIC & ABOVE

Depth to Bottom (ft.): 17.35
Static Water Level Before (ft.): 0.67
Static Water Level After (ft.):
Screen Length (ft.): UNKNOWN
Specific Capacity: "
Casing ID (in.): 4"

Responsible Personnel: S. CAMDEN & T. RUSSELL
Drilling Co.: UNKNOWN
Project Name: NSF Indian Head
Project Number: 112G00810

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1030	*	0	0.67	11.09	5.55	4	>1000	BRN (WATTERRIA)
1037	*	7	8.25	10.28	5.45	30	456	↓
1105	*	7	6.45	10.52	5.42	5	160	Slightly cloudy (PERISTALTIC)
1115	*	9	7.90	10.34	5.36	4	100	very slightly cloudy
1125	*	11	8.42	10.26	5.33	4	110	"
1135	*	13	8.83	10.28	5.30	4	130	"
1145	*	15	9.20	10.29	5.28	4	140	"
1155	*	17	9.51	10.26	5.21	4	150	"
1205	*	19	9.77	10.30	5.18	4	160	"
1210	*	20	9.87	10.30	5.16	4	160	"
1215	*	21	9.98	10.32	5.15	4	150	"
* NO SEDIMENT ACCUMULATION - BOTTOM OF WELL SOUNDED HARD								

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 25MW02
Site: AREA 8
Date Installed: UNKNOWN
Date Developed: 3/13/10
Dev. Method: WATTERRA
Pump Type: PERISTALTIC

Depth to Bottom (ft.): 20.19
Static Water Level Before (ft.): 7.26
Static Water Level After (ft.):
Screen Length (ft.): UNKNOWN
Specific Capacity: "
Casing ID (in.): 4"

Responsible Personnel: S. CAMERON / T. ROJAHN
Drilling Co.: UNKNOWN
Project Name: NSF Indian Head
Project Number: 112G00810

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/cm)	Turbidity (NTU)	Remarks (odor, color, etc.)
1400	*	0	7.26	10.07	5.75	9	>1000	DARK GREEN/BRN SUSPENDED SOLIDS
1420	*	7	8.68	10.26	5.80	7	>1000	brn + very cloudy
1430	*	8	8.92	10.15	5.27	5	700	"
1440	*	9	8.84	10.14	5.02	4	450	"
1450	*	10	8.76	10.20	5.02	4	380	brn + cloudy
1500	*	11	8.70	10.30	5.01	4	250	cloudy
1510	*	12	8.68	10.07	4.98	4	100	very slightly cloudy
1515	*	12.5	8.68	10.08	4.96	4	65	"
1520	*	13	8.67	10.09	4.94	4	60	clear
	* NONE - NO SEDIMENT ACCUMULATION - BOTTOM OF WELL SOUNDED HARD							

WATTERRA → PERISTALTIC

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 02MW03 (5)
Site: AREA 8
Date Installed: UNKNOWN
Date Developed: 3/13/10
Dev. Method: WATTERRIA
Pump Type: "

Depth to Bottom (ft.): 44.0
Static Water Level Before (ft.): 29.68
Static Water Level After (ft.): 36.22
Screen Length (ft.): UNKOWN
Specific Capacity: "
Casing ID (in.): 4"

Responsible Personnel: T. ROSAHN
Drilling Co.: UNKNOWN
Project Name: NSF Indian Head
Project Number: 112G00810

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/m)	Turbidity (NTU)	Remarks (odor, color, etc.)
0910	*	0	29.68	13.18	5.13	"	>1000	BRN WATTERRIA
0919	*	5		13.19	5.39	8	>1000	
0930	*	10		13.20	5.45	8	>1000	
0940	*	15	36.22	13.20	5.50	8	>1000	SL. BRN
* NO ACCUMULATED SEDIMENT - BOTTOM OF WELL HARD								
UNABLE TO USE PERISTALTIC TO REDUCE TURBIDITY - WATER LEVEL TO LOW!!!								

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 26MW01
Site: BASIC IED
Date Installed: UNKNOWN
Date Developed: 3/12/10
Dev. Method: WATTERRIA
Pump Type: PERISTALTIC / SAME AS ABOVE

Depth to Bottom (ft.): 17.40
Static Water Level Before (ft.): 8.26
Static Water Level After (ft.): 9.18
Screen Length (ft.): UNKNOWN
Specific Capacity: "
Casing ID (in.): 4"
Well Vol. 6gal

Responsible Personnel: T. ROJAHN
Drilling Co.: UNKNOWN
Project Name: NSF Indian Head
Project Number: 112G00810

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/m)	Turbidity (NTU)	Remarks (odor, color, etc.)
1425	*NONE	0	8.26	11.05	5.03	44	71000	BRN WATTERRIA
1430	"	5	10.79	10.44	4.99	44	71000	" ↓
				~~10.~~				START PERISTALTIC
1440	"	5	9.01	10.33	4.83	45	71000	BRN
1450	"	7	9.08	10.37	4.84	44	450	Cloudy
1500	"	9	9.13	10.43	4.86	44	260	Cloudy
1510	"	11	9.16	10.46	4.86	43	150	Cloudy (very slightly)
1515	"	12	9.18	10.48	4.85	43	100	clear

* SOUND BOTTOM OF WELL HARD - NO ACCUMULATION OF SEDIMENT!

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 26MW002
Site: BASIC IED
Date Installed: UNKNOWN
Date Developed: 3/12/10
Dev. Method: SURGE & PURGE
Pump Type: PERISTALTIC

Depth to Bottom (ft.): 24.00
Static Water Level Before (ft.): 3.63
Static Water Level After (ft.): 8.04
Screen Length (ft.): UNKNOWN
Specific Capacity: "
Casing ID (in.): 4"

Responsible Personnel: T. ROJAHN
Drilling Co.: UNKNOWN
Project Name: NSF Indian Head
Project Number: 112G00810

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume ~~(Gal.)~~ L	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units ~~MS/m~~)	Turbidity (NTU)	Remarks (odor, color, etc.)
1640	*	0	3.63	10.99	4.79	10	71000	BRN WATTERRIA
1650	↓	10	6.65	10.88	4.81	10	700	BRN ↓
1700		20	7.38	10.79	4.81	10	210	CLOUDY W/PERCIPITANT Peristaltic
1710		30	8.32	10.65	4.81	10	160	SI Cloudy
1720	↓	40	8.04	10.39	4.80	10	45	CLEAR ↓
* SOUND WELL Bottom - NO SEDI ACCUMULATION.								

Tetra Tech NUS, Inc.

MONITORING WELL DEVELOPMENT RECORD

Well: 26MW03
Site: BASIC IGD
Date Installed: UNKNOWN
Date Developed: 3/12/96
Dev. Method: WATTERRIA
Pump Type: PERISTALTIC/ABOVE

Depth to Bottom (ft.): 20.25
Static Water Level Before (ft.): 4.60
Static Water Level After (ft.): 7.90
Screen Length (ft.): UNKNOWN
Specific Capacity: UNKNOWN
Casing ID (in.): 4"

Responsible Personnel: T. ROSAHN
Drilling Co.: UNKNOWN
Project Name: NSF Indian Head
Project Number: 112G00810

WELL VOL - 10.5 gal

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	pH	Specific Conductance (Units mS/m)	Turbidity (NTU)	Remarks (odor, color, etc.)
1140	*	0	4.6	12.35	5.02	13	50	WATTERIA CLEAR
1150	*	5	9.35	11.51	5.14	10	>1000	" LT BRN
—	—	—	—	—	—	—	→	SET UP PERISTALTIC
1200	NA	5	7.08	—	—	—	—	NO SED ON BOTTOM - HARD
1210	↓	7	7.40	10.08	5.30	7	140	SL. CLOUDY
1220	↓	9	7.64	10.44	5.12	6	110	V SL. CLOUDY
1230	↓	11	7.82	10.44	5.08	5	85	V SL CLOUDY
1235	↓	12	7.90	10.42	5.11	5	70	CLEAR
	* SOUND WELL BOTTOM - NO SEDIMENT ACCUMULATION !							

APPENDIX F.20

EQUIPMENT INSPECTION

EQUIPMENT INSPECTION

COMPANY: Vironex **UNIT NO.** 6620DT

FREQUENCY: Inspect at the initiation of the project, after repairs, once every 10-day shift.

Inspection Date: 3/9/10 Time: 4:15pm Equipment Type: DPT Rig
(e.g., bulldozer, generator)

	Good	Need Repair	N/A
Tires or tracks	☑	☐	☐
Hoses and belts	☑	☐	☐
Cab, mirrors, safety glass	☐	☐	☑
- Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	☐	☐	☑
- Is the equipment equipped with audible back-up alarms and back-up lights?	☐	☐	☑
Horn and gauges	☑	☐	☐
Brake condition (dynamic, park, etc.)	☐	☐	☑
Fire extinguisher (Type/Rating - Amerx)	☑	☐	☐
Fluid Levels:			
- Engine oil	☑	☐	☐
- Transmission fluid	☑	☐	☐
- Brake fluid	☑	☐	☐
- Cooling system fluid	☑	☐	☐
- Windshield wipers	☐	☐	☑
- Hydraulic oil	☑	☐	☐
Oil leak/lube	☑	☐	☐
Coupling devices and connectors	☐	☐	☑
Exhaust system	☑	☐	☐
Blade/boom/ripper condition	☑	☐	☐
Access-ways: Frame, hand holds, ladders, walkways (non-slip surfaces), guardrails?	☐	☐	☑
Power cable and/or hoist cable	☐	☐	☑
Steering (standard and emergency)	☐	☐	☑

Safety Guards:	Yes	No
– Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact?	☑	☐
– Hot pipes and surfaces exposed to accidental contact?	☐	☑
– All emergency shut offs have been identified and communicated to the field crew?	☑	☐
– Have emergency shutoffs been field tested?	☑	☐
– Results? works	☑	☐
– Are any structural members bent, rusted, or otherwise show signs of damage?	☐	☑
– Are fueling cans used with this equipment approved type safety cans?	☑	☐

EQUIPMENT INSPECTION (Continued)

- Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use? ☑ ☐

Portable Power Tools:

- Tools and Equipment in Safe Condition? ☑ ☐
- Saw blades, grinding wheels free from recognizable defects (grinding wheels have been sounded)? ☑ ☐
- Portable electric tools properly grounded? N/A ☐ ☐
- Damage to electrical power cords? N/A ☐ ☑
- Blade guards in place? ☑ ☐
- Components adjusted as per manufacturers recommendation? ☑ ☐

Cleanliness:

- Overall condition (was the decontamination performed prior to arrival on-site considered acceptable)? yes
- Where was this equipment used prior to its arrival on site? Norfolk VA
- Site Contaminants of concern at the previous site? Decontaminated
- Inside debris (coffee cups, soda cans, tools and equipment) blocking free access to foot controls? no

Operator Qualifications (as applicable for all heavy equipment):

- Does the operator have proper licensing where applicable, (e.g., CDL)? N/A
- Does the operator, understand the equipment's operating instructions? N/A
- Is the operator experienced with this equipment? yes
- Does the operator have emotional and/or physical limitations which would prevent him/her from performing this task in a safe manner? Not that I know of.
- Is the operator 21 years of age or more? yes

Identification:

- Is a tagging system available, for positive identification, for tools removed from service? yes

Additional Inspection Required Prior to Use On-Site

	Yes	No
Does equipment emit noise levels above 90 decibels?	☐	☑
If so, has an 8-hour noise dosimetry test been performed? N/A	☐	☐

- Results of noise dosimetry: N/A
- Defects and repairs needed: None
- General Safety Condition: good
- Operator or mechanic signature:

Site Safety Officer Signature: [signature] / Ellen Berklite

Approved for Use: ☑ Yes [signature] ☐ No

EQUIPMENT INSPECTION

COMPANY:_____ **UNIT NO.**_____
FREQUENCY: Inspect at the initiation of the project, after repairs, once every 10-day shift.

Inspection Date: ____/____/____ Time: _____ Equipment Type:_____
(e.g., bulldozer, generator)

	Good	Need Repair	N/A
Tires or tracks	❒	❒	❒
Hoses and belts	❒	❒	❒
Cab, mirrors, safety glass	❒	❒	❒
- Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	❒	❒	❒
- Is the equipment equipped with audible back-up alarms and back-up lights?	❒	❒	❒
Horn and gauges	❒	❒	❒
Brake condition (dynamic, park, etc.)	❒	❒	❒
Fire extinguisher (Type/Rating -_____)	❒	❒	❒
Fluid Levels:			
- Engine oil	❒	❒	❒
- Transmission fluid	❒	❒	❒
- Brake fluid	❒	❒	❒
- Cooling system fluid	❒	❒	❒
- Windshield wipers	❒	❒	❒
- Hydraulic oil	❒	❒	❒
Oil leak/lube	❒	❒	❒
Coupling devices and connectors	❒	❒	❒
Exhaust system	❒	❒	❒
Blade/boom/ripper condition	❒	❒	❒
Access-ways: Frame, hand holds, ladders, walkways (non-slip surfaces), guardrails?	❒	❒	❒
Power cable and/or hoist cable	❒	❒	❒
Steering (standard and emergency)	❒	❒	❒

Safety Guards:	**Yes**	**No**
– Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact?_____	❒	❒
– Hot pipes and surfaces exposed to accidental contact?_____	❒	❒
– All emergency shut offs have been identified and communicated to the field crew?_____	❒	❒
– Have emergency shutoffs been field tested? _____	❒	❒
– Results?_____	❒	❒
– Are any structural members bent, rusted, or otherwise show signs of damage?_____	❒	❒
– Are fueling cans used with this equipment approved type safety cans?_____	❒	❒

EQUIPMENT INSPECTION (Continued)

- Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use?_____ ❒ ❒

Portable Power Tools:

- Tools and Equipment in Safe Condition?_____ ❒ ❒
- Saw blades, grinding wheels free from recognizable defects (grinding wheels have been sounded)? ❒ ❒
- Portable electric tools properly grounded?_____ ❒ ❒
- Damage to electrical power cords?_____ ❒ ❒
- Blade guards in place?_____ ❒ ❒
- Components adjusted as per manufacturers recommendation?_____ ❒ ❒

Cleanliness:

- Overall condition (was the decontamination performed prior to arrival on-site considered acceptable)?_____
- Where was this equipment used prior to its arrival on site?_____
- Site Contaminants of concern at the previous site?_____
- Inside debris (coffee cups, soda cans, tools and equipment) blocking free access to foot controls?_____

Operator Qualifications (as applicable for all heavy equipment):

- Does the operator have proper licensing where applicable, (e.g., CDL)?_____
- Does the operator, understand the equipment's operating instructions?_____
- Is the operator experienced with this equipment? _____
- Does the operator have emotional and/or physical limitations which would prevent him/her from performing this task in a safe manner?_____
- Is the operator 21 years of age or more?_____

Identification:

- Is a tagging system available, for positive identification, for tools removed from service?___

Additional Inspection Required Prior to Use On-Site

	Yes	No
– Does equipment emit noise levels above 90 decibels?	❒	❒
– If so, has an 8-hour noise dosimetry test been performed?	❒	❒

- Results of noise dosimetry:_____
- Defects and repairs needed:_____
- General Safety Condition: _____
- Operator or mechanic signature:_____

Site Safety Officer Signature:_____

Approved for Use: ❒ Yes ❒ No

EQUIPMENT INSPECTION

COMPANY:_____ **UNIT NO.**_____
FREQUENCY: Inspect at the initiation of the project, after repairs, once every 10-day shift.

Inspection Date: ____/____/____ Time: _____ Equipment Type:_____
(e.g., bulldozer, generator)

	Good	Need Repair	N/A
Tires or tracks	❒	❒	❒
Hoses and belts	❒	❒	❒
Cab, mirrors, safety glass	❒	❒	❒
- Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	❒	❒	❒
- Is the equipment equipped with audible back-up alarms and back-up lights?	❒	❒	❒
Horn and gauges	❒	❒	❒
Brake condition (dynamic, park, etc.)	❒	❒	❒
Fire extinguisher (Type/Rating -_____)	❒	❒	❒
Fluid Levels:			
- Engine oil	❒	❒	❒
- Transmission fluid	❒	❒	❒
- Brake fluid	❒	❒	❒
- Cooling system fluid	❒	❒	❒
- Windshield wipers	❒	❒	❒
- Hydraulic oil	❒	❒	❒
Oil leak/lube	❒	❒	❒
Coupling devices and connectors	❒	❒	❒
Exhaust system	❒	❒	❒
Blade/boom/ripper condition	❒	❒	❒
Access-ways: Frame, hand holds, ladders, walkways (non-slip surfaces), guardrails?	❒	❒	❒
Power cable and/or hoist cable	❒	❒	❒
Steering (standard and emergency)	❒	❒	❒

Safety Guards:	**Yes**	**No**
– Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact?_____	❒	❒
– Hot pipes and surfaces exposed to accidental contact?_____	❒	❒
– All emergency shut offs have been identified and communicated to the field crew?_____	❒	❒
– Have emergency shutoffs been field tested? _____	❒	❒
– Results?_____	❒	❒
– Are any structural members bent, rusted, or otherwise show signs of damage?_____	❒	❒
– Are fueling cans used with this equipment approved type safety cans?_____	❒	❒

EQUIPMENT INSPECTION (Continued)

- Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use?_____ ❒ ❒

Portable Power Tools:

- Tools and Equipment in Safe Condition?_____ ❒ ❒
- Saw blades, grinding wheels free from recognizable defects (grinding wheels have been sounded)? ❒ ❒
- Portable electric tools properly grounded?_____ ❒ ❒
- Damage to electrical power cords?_____ ❒ ❒
- Blade guards in place?_____ ❒ ❒
- Components adjusted as per manufacturers recommendation?_____ ❒ ❒

Cleanliness:

- Overall condition (was the decontamination performed prior to arrival on-site considered acceptable)?_____
- Where was this equipment used prior to its arrival on site?_____
- Site Contaminants of concern at the previous site?_____
- Inside debris (coffee cups, soda cans, tools and equipment) blocking free access to foot controls?_____

Operator Qualifications (as applicable for all heavy equipment):

- Does the operator have proper licensing where applicable, (e.g., CDL)?_____
- Does the operator, understand the equipment's operating instructions?_____
- Is the operator experienced with this equipment? _____
- Does the operator have emotional and/or physical limitations which would prevent him/her from performing this task in a safe manner?_____
- Is the operator 21 years of age or more?_____

Identification:

- Is a tagging system available, for positive identification, for tools removed from service?___

Additional Inspection Required Prior to Use On-Site

	Yes	No
– Does equipment emit noise levels above 90 decibels?	❒	❒
– If so, has an 8-hour noise dosimetry test been performed?	❒	❒

- Results of noise dosimetry:_____
- Defects and repairs needed:_____
- General Safety Condition: _____
- Operator or mechanic signature:_____

Site Safety Officer Signature:_____

Approved for Use: ❒ Yes ❒ No

APPENDIX F.21

SITE SPECIFIC TRAINING

FIGURE 8-1

SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing the site investigation activities at Indian Head, and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Work practices to minimize risks from hazards
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Spill response procedures
- Review of contents of relevant Material Safety Data Sheets
- Review of the use of the Accident Prevention Plan and Activity Hazard Analysis
- Stop Work Authorization and Process

I have been given the opportunity to ask questions and my questions have been answered to my satisfaction, and that the dates of my training and medical surveillance indicated below are accurate.

Name (Printed and Signature)	Site-Specific Training Date	40-Hour Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Exam
Terry Rosamm	1/18/10	10/85	9/18/09	3/88	3/11/09
Jacob Birkett	1-18-10	11-08	1-22-10	—	11-08
Fred W Ramsey	2-1-10	7/91	10/09	10/09	12/08
Stuart Cameron	3-09-10	9/08	1-28-10	—	3/9/10
William Jacks	3-9-10	9-12-08	9-11-09		9-4-08
Justin Linkowich	3-9-10	8/25/09	—	—	8/10/09
Ellen Berkheiser	3-9-10	5/26/06	3/1/2009	—	1/13/2010
Jeff Dziamik					

FIGURE 8-1

SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing the site investigation activities at Indian Head, and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Work practices to minimize risks from hazards
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Spill response procedures
- Review of contents of relevant Material Safety Data Sheets
- Review of the use of the Accident Prevention Plan and Activity Hazard Analysis
- Stop Work Authorization and Process

I have been given the opportunity to ask questions and my questions have been answered to my satisfaction, and that the dates of my training and medical surveillance indicated below are accurate.

Name (Printed and Signature)	Site-Specific Training Date	40-Hour Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Exam

FIGURE 8-1

SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing the site investigation activities at Indian Head, and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Work practices to minimize risks from hazards
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Spill response procedures
- Review of contents of relevant Material Safety Data Sheets
- Review of the use of the Accident Prevention Plan and Activity Hazard Analysis
- Stop Work Authorization and Process

I have been given the opportunity to ask questions and my questions have been answered to my satisfaction, and that the dates of my training and medical surveillance indicated below are accurate.

Name (Printed and Signature)	Site-Specific Training Date	40-Hour Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Exam

APPENDIX F.22

EXPLOSIVE SAFETY SUBMISSION DETERMINATION REQUEST

DEPARTMENT OF THE NAVY
NAVAL ORDNANCE SAFETY AND SECURITY ACTIVITY
FARRAGUT HALL
3817 STRAUSS AVENUE, SUITE 108
INDIAN HEAD, MD 20640-5151

8020
Ser N537/1871
5 Nov 09

From: Commanding Officer, Naval Ordnance Safety and Security Activity
To: Commanding Officer, Naval Facilities Engineering Command, Washington

Subj: EXPLOSIVES SAFETY SUBMISSION DETERMINATION REQUEST FOR NAVAL SUPPORT FACILITY INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Ref: (a) E-mail NAVFAC Washington Mr. N. Carros/NOSSA (N537) Mr. R. Urbanski of 30 Oct 09 (w/encl)
(b) NOSSAINST 8020.15A, Explosives Safety Review, Oversight, and Verification of Munitions Responses, of 2 Feb 07
(c) NAVSEA OP 5, Revision 7

1. As requested by reference (a), the Naval Ordnance Safety and Security Activity (NOSSA) reviewed the subject Explosives Safety Submission (ESS) Determination Request in accordance with references (b) and (c). Based on the information provided, NOSSA has determined that an ESS is not required to conduct site preparation, site inspection, geophysical survey, and soil sampling operations at Naval Support Facility Indian Head, Stump Neck Annex, Indian Head, Maryland at the following sites: Air Blast Pond, Area 8, EOD School Demolition Area, Basic IED Area, Advanced IED Area, Stump Neck Impact Area, Test Area 1, Valley Impact Area, Torpedo Burial Site, and Torpedo Casing Disposal Area.

2. As outlined in your request, we understand that the likelihood of encountering munitions and explosives of concern (MEC) or Material Potentially Presenting an Explosive Hazard (MPPEH) during the proposed operations has been determined to be low and the following conditions apply:

a. An unexploded ordnance (UXO) qualified Technician will provide anomaly avoidance services during all planned operations.

Subj: EXPLOSIVES SAFETY SUBMISSION DETERMINATION REQUEST FOR NAVAL SUPPORT FACILITY INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

b. Planned operations are:

(1) Site survey and mapping to include grid/transect setup.

(2) Detector aided surface survey. No discovered MEC/MPPEH is to be moved or disturbed in any manner.

(3) Geophysical survey. UXO Technicians are authorized to remove non-munitions debris from the surface.

(4) Soil sampling to a depth of 6 feet by means of hand tools or Direct Push Technology. A UXO Technician must verify the absence of anomalies in the sampling location prior to sampling.

c. Authorization is granted for project personnel to be within the unbarricaded (K18) intraline (IL) Explosives Safety Quantity Distance arcs emanating from nearby potential explosion sites (PESs). When the above listed operations occur at less than IL distance from a PES, work schedules must be coordinated to minimize the number of non-essential personnel exposed to the potentially hazardous effect from the PES.

3. However, if surface MEC or MPPEH is discovered on the site while employing anomaly avoidance techniques, the item will be avoided and its location and description will be reported to the cognizant Explosive Safety Officer and the Navy Project Manager. An emergency response from the cognizant Explosive Ordnance Disposal detachment will be requested, if needed.

4. The NOSSA point of contact for this ESS determination is Mr. Rick Urbanski, who can be contacted at DSN 354-5636 or commercial at 301-744-5636.

TAMMY K. SCHIRF
By direction

Copy to: (see next page)

Subj: EXPLOSIVES SAFETY SUBMISSION DETERMINATION REQUEST FOR NAVAL SUPPORT FACILITY INDIAN HEAD, STUMP NECK ANNEX, INDIAN HEAD, MARYLAND

Copy to:
CNO (A. Malson; W. Holmes and E. Newbaker)
NAVFAC HQ (R. Sadorra)
NAVFAC WASHINGTON (J. Rail)
NSASP (J. Bossart and N. Carros)
NAVEODTECHDIV INDIAN HEAD (L. Kijek)
NOSSA ESSOLANT (B. Sizemore and D. Moore)

APPENDIX F.23

CLASS A WORK APPROVAL PERMIT

Class A Work Approval Permit & Record of CATEX
Naval Support Facility - Indian Head

Section A. **Customer Supplied Information** (by applicant) Tracking Number: 10-012

Name of Applicant: Nick Carros Date of Application: 10/2/2009 Phone ext.: x2263

Project Name: Stump Neck: Soil Sampling at 10 MRP Sites Applicant Email: nicholas.carros@navy.mil

Organization Submitting Application: NAVFAC Organization Requesting Action: NDW

Work Request/ Service Ticket: Anticipated Dates of Work: Start: 11/16/2009 Completion: 1/29/2010

Expiration Date: 180 Days from Date of Approval Building Number(s):

Section B. **Site Issues** (by CWAP Coordinator or Authorized Personnel)

Checked Issues must be approved by the appropriate Resource Manager.

Work Restriction Area	Approval Date	Work Restriction Area	Approval Date
☑ ESQD Arcs (K=18, K=24)	11/5/2009	▩ MDE, WMA Stormwater Management	
☑ Survey Control/Property Points	11/13/2009	▩ MDE, WMA Sediment Erosion Control	
☐ Other Pipe Work		▩ MDE, WMA Notice of Intent (NOI)	
☑ Installation Restoration (IR) Site	11/13/2009	☑ Archeological Area	11/13/2009
☐ Worker Notification Area		☐ Historic Building	
☑ Surface Water/ Wetlands Buffer	10/28/2009	☑ Buried Utilities -- Utility Location Required	N/A
☑ 100 Year Flood Plain	10/28/2009	☑ Munitions Response (MRP) Site	11/13/2009
☑ Eagle Nest Buffer	10/28/2009	☑ Other Work Restriction Area	11/13/2009
☑ Natural Resources/Earth Disturb.	11/13/2009	▩ No Work Restriction Areas	

Conditions for Approval (Resource Manager Consulted)

See next page for list of Work Conditions.

Site Restrictions Verification (by NEPA Program Manager or Authorized Personnel)

Signature of Verifying Official HUMPHREYS.JAMES.K.1229216860

Digitally signed by HUMPHREYS.JAMES.K.1229216860
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USN, cn=HUMPHREYS.JAMES.K.1229216860
Date: 2009.11.17 14:52:14 -05'00' Date

Section C. – Permit Receipt (by applicant)

I have read and understood the conditions for approval listed in Section B. All work will be performed in accordance with these conditions:

Applicant: _____ Date: _____

Note: This permit is not valid without the signature of the NEPA Program Manager and Applicant. Signed permit must be on-site while all work is being performed.

Class A Work Approval Permit & Record of CATEX
Naval Support Facility - Indian Head

MRP_Conditions
Work will sample 10 MRP Sites at Stump Neck. Workers must adhere to the requirements specified in the ESS Determination Request (see attachment) and follow all safety procedures listed in the work plan.

IR_Conditions
Work area overlaps IR Sites 19, 28, 36, 37, and 65. Follow all safety procedures listed in the work plan.

SurfaceWaterWetlandsBuffer_Conditions
Work will occur within streams and wetlands. Minimize earth and vegetation disturbance.

EagleNestBuffer_Conditions
Work at UXO-2 "Area 8" and UXO-5 "Advanced IED Area" occurs within 750-ft of the "Hypervelocity #2" and "Area 8" bald eagle nests. Work requiring the use of loud, disruptive equipment/instruments (e.g., power tools, chain saws, backhoes) at UXO-2 and UXO-5 must be completed prior to the eagle nesting season (starts Dec. 15th). However, there are no time-of-year restrictions at UXO-2 or UXO-5 for the use of non-disruptive equipment (e.g., hand tools).

Archeological_Conditions
Per SHPO determination (see attached e-mail), soil sampling at Stump Neck would not result in an adverse effect to archeological resources. However, contractor needs to be made aware of the boundaries of the archeologically sensitive areas where sampling will occur and try to minimize earth disturbance. Contractor must coordinate with the Cultural Resources Manager, Tommy Wright (x2263), before sampling within archeological sites. Contractor must stop work and notify the Cultural Resources Manager immediately of any discoveries of potential cultural resources (e.g., projectile points, pottery, funerary remains, building foundations).

100YearFloodPlain_Conditions
Work may occur within the 100 year floodplain. Minimize earth disturbance.

SurveyControl_Conditions
Contractor will either avoid disturbing survey markers or will be responsible for replacement of any disturbed survey markers. Contact Bob Wetherald (x4406) for further guidance.

BuriedUtilities_Conditions
Utility Location Required

ESQDArcs_Conditions
Work will occur within K18 and K24 arcs. The contractor must follow all requirements specified in the ESS Determination Requests, signed by NOSSA 5 November 2009 (see attachment).

NaturalResourcesEarthDisturbance_Conditions

- Soil samples will be collected via hand auger and direct-push technology (DPT) between 0-4 ft. below ground surface (bgs) at different locations based on the detector-aided sweeps and geophysical surveys. Minimize earth disturbances at each sampling location.
- All boring holes must be filled and capped per Maryland State Regulations. If insufficient soil is available to fill the hole to the ground surface, bentonite pellets mixed with the soil will be used to backfill the hole, and hydrated with potable water.
- Any waste generated during sampling will be disposed of according to work plan, so as to not contribute to further environmental contamination or pose a threat to public health or safety.
- Sampling at UXO-1, 2, 4, 5, 10, 12, 26, and 28 will occur within species protections areas (Chicamuxen Creek Marsh, Porter Woods, and West Stump Neck Shoreline Area). Minimize earth and vegetation disturbance.

Other_Conditions

- Waste material/equipment generated from the work areas must be disposed of in the proper manner and not left on site.
- Contractors must check daily/weekly with Larry Kijek (x6871) and brief him on their daily/weekly work plans, in order to avoid any issues with ESQD arcs or explosives operations. Extensive coordination with Larry Kijek and Range 3 is required for any sampling within Range 3, which conducts daily explosives operations.

Class A Work Approval Permit & Record of CATEX
Naval Support Facility - Indian Head

Section D. Project Details

Project Description:

See next page for project description.

Location Description:

UXO-1, UXO-02, UXO-04, UXO-05, UXO-10, UXO-12, UXO-21, UXO-23, UXO-26, and UXO-28.

Does project involve removing, breaking or opening any piping, tubing, hoses or tanks? ○ Yes ◉ No

If yes what is the pipe, tube or hose used for?: _____

Other pipework comments:

Section E. Resource Manager Contact Information

Jim Humphreys Bldg. 103 x2261 james.k.humphreys@navy.mil
Installation Restoration (IR) Sites; Munitions Response Program (MRP) Sites; Worker Notification Areas

Seth Berry Bldg. 289 x2273 seth.m.berry@navy.mil
Natural Resources; Earth Disturbance; Surface Water; Wetlands; 100-Year Floodplain; Bald Eagle Protection Areas

Tommy Wright Bldg. 289 x2260 thomas.a.wright@navy.mil
Archeological Areas; Historic Buildings

Diana Rose Bldg. 289 x2267 diana.rose@navy.mil
Sanitary and Industrial Wastewater

Sharon Brown Bldg. 482 x1712 sharon.brown@navy.mil
Explosives Safety Quantity-Distance (ESQD) Arcs

Jim Humphreys Bldg. 103 x2261 james.k.humphreys@navy.mil
MDE, WMA Stormwater Management, Sediment Erosion Control, Notices of Intent (NOI)

Bob Wetherald Bldg. 551 x2168 bob.wetherald@navy.mil
Survey Control Points

Dennis Tomlinson Bldg. 1601 x2469 dennis.tomlinson@navy.mil
Worker Safety (OSHA)

10-012 Project Description

Project will perform site inspections (SI) of ten Munitions Response Program (MRP) sites located throughout the Stump Neck Annex, which may contain munitions and explosives of concern (MEC) and/or munitions constituents (MC). The primary objective of the SI is to determine whether further response actions or remedial investigations are needed to restore any of the ten sites to an acceptable environmental condition. The SI for the ten MRP sites consists of two different investigations, which will be conducted in two phases. The equipment used for the investigations will consist of a Geometric G858 Magnetometer, Geo Nicacs EM61-MK2, hand-held metal detectors, hand tools, GPS (non-transmitting), direct-push technology (DPT) rig, and hand augers.

The first phase will be conducted at all ten UXO (Unexploded Ordnances) sites. Phase one will consist of the MEC investigations which includes detector-aided surface sweeps for MEC, followed by subsurface geophysics investigations. Limited vegetation removal will be performed prior to phase one and will be limited to surface clearing.

Phase one results will be used to determine the locations for the second phase: sampling (surface soil, subsurface soil, sediment, surface water, and ground water). Sampling within the MRP site will be focused in areas with observed munitions debris, suspect MEC, or anomaly clusters to determine if explosive contamination is present. Sampling will include the following:

UXO-01 "Air Blast Pond"

- Total of 46 soil samples at 20 locations;
    - 40 surface samples collected from 0 to 6 and 0 to 24 in. below ground surface(bgs);
    - Six subsurface samples collected from 2 to 4 ft. bgs;
- All soil samples will be collected via hand auger;

UXO-02 "Area 8"

- Total of 120 soil samples at 40 locations;
    - 80 surface soil samples from 0 to 6 and 0 to 24 in. bgs;
    - 20 subsurface samples collected from 2-4 and 4-6 ft. bgs;
- Seven sediment samples collected from 0-6 in.;
    - Three sediment samples under surface water flow within Chicamuxen Creek in areas where training was known to occur;
    - Four sediment samples from within the pond;
- Six groundwater samples;
    - Three will be collected from existing wells and the rest from new temporary monitoring wells installed in soil borings;
- All soil samples will be collected via hand auger and DPT;

UXO-04 "Basic IED Area"

- Total of 80 soil samples at 20 locations;
    - 40 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
    - 40 subsurface samples collected from 2 to 4 and 4 to 6 ft. bgs;
- All soil samples will be collected via hand auger;

UXO-05 "Advanced IED Area"

- Total of 80 soil samples at 20 locations.
  - 40 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
  - 40 subsurface samples collected from 2 to 4 and 4 to 6 ft. bgs;
- All soil samples will be collected via hand auger;

UXO-10 "Stump Neck Impact Area"

- Total of 40 soil samples at 10 locations;
  - 20 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
  - 20 subsurface samples collected from 2 to 4 and 4 to 6 ft. bgs;
- All soil samples will be collected via hand auger and DPT;

UXO-12 "Torpedo Burial Site"

- Total of 20 subsurface soil samples at 10 locations from 2 to 4 and 4 to 6 ft. bgs;
- Two sediment samples, collected from 0 to 6 in. bgs in the drainage channel;
- One surface water sample collected in the drainage channel;
- All soil samples will be collected via hand auger and DPT;

UXO-21 "Test Area 1"

- A total of 41 soil samples at 21 locations;
  - 21 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
- All soil samples will be collected via hand auger;

UXO-23 "Torpedo Casing Disposal Area"

- A total of 20 subsurface soil samples at 10 locations from 2 to 4 and 4 to 6 ft. bgs;
- All soil samples will be collected via hand auger and DPT;

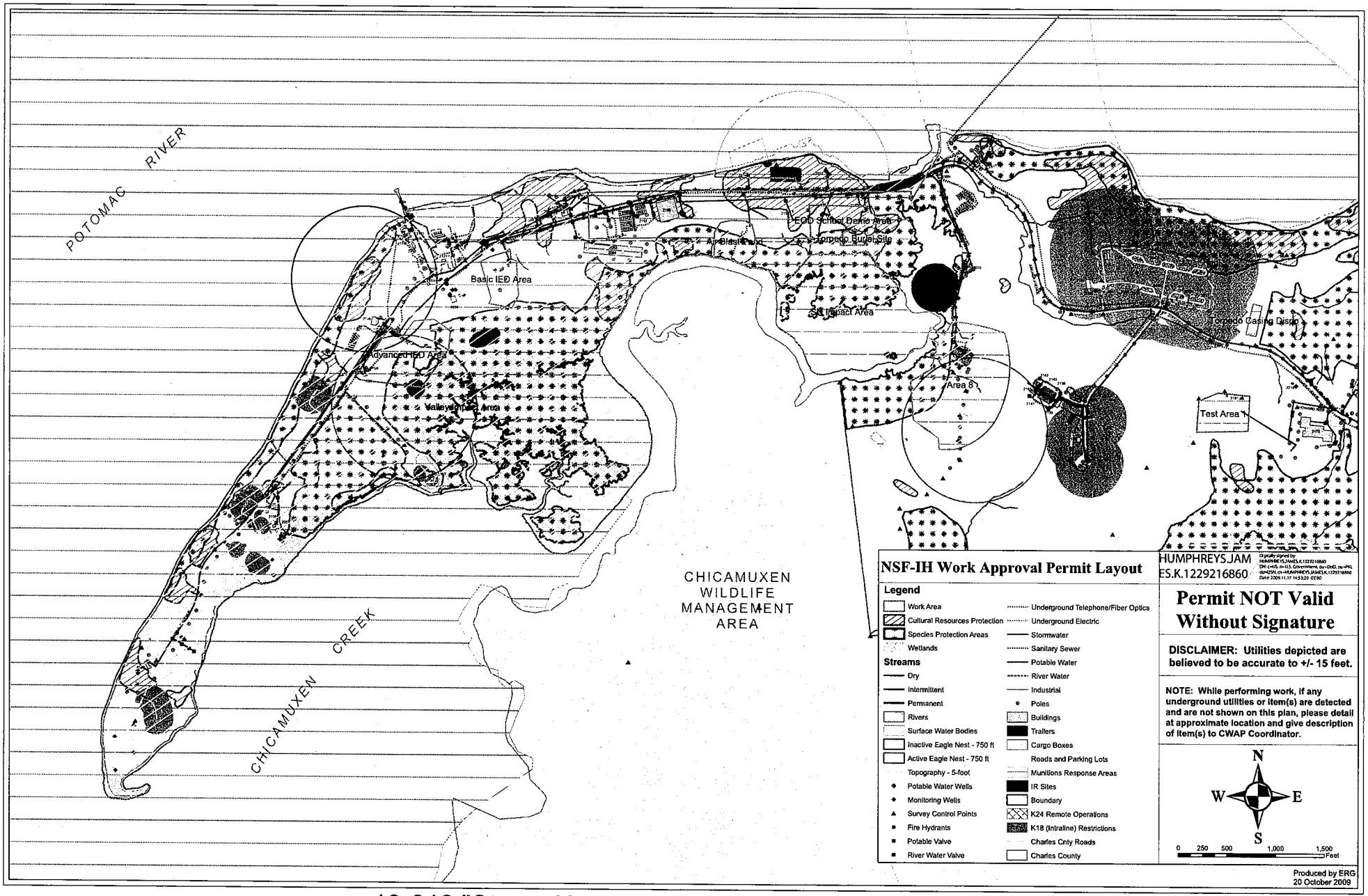
UXO-26 "The Valley Impact Area"

- Detector-Aided Sweeps and Geophysical Surveys will be conducted along 400-ft transects within this area, outside of other delineated UXO sites, active ranges, or other inaccessible areas;

UXO-28 "EOD School Demolition Area"

- Total of 40 soil samples at 20 locations;
  - 20 surface samples collected from 0 to 6 and 0 to 24 in. bgs;
- All soil samples will be collected via hand auger.

Contractor trailers and a port-o-john will be sited at the intersection of Archer Avenue and Roach's Run, near Building 43SN. Electrical power for the trailers will be provided by a small generator.



10-012 "Stump Neck: Soil Sampling of 10 MRP Sites"

APPENDIX F.24

FIELD BOOK 1

TITLE NSF INDIAN HEAD
MCM 1-18-10

PROJECT NO. 112G00810
BOOK NO. 1440

Work continued from Page

0700 HRS - TRAVEL DAY - LEFT PITTSBURGH
TO WALDORF MD ARRIVE @ 1220 HRS
1232 HRS - PURCHASE SUPPLIES @ STAPLES
1645 HRS - PURCHASE SUPPLIES @ HOME DEPOT
1743 HRS - PURCHASE SUPPLIES @ WALMART
1815 HRS - MEET W/ J. BIRKETT @ HOTEL LOBBY

END

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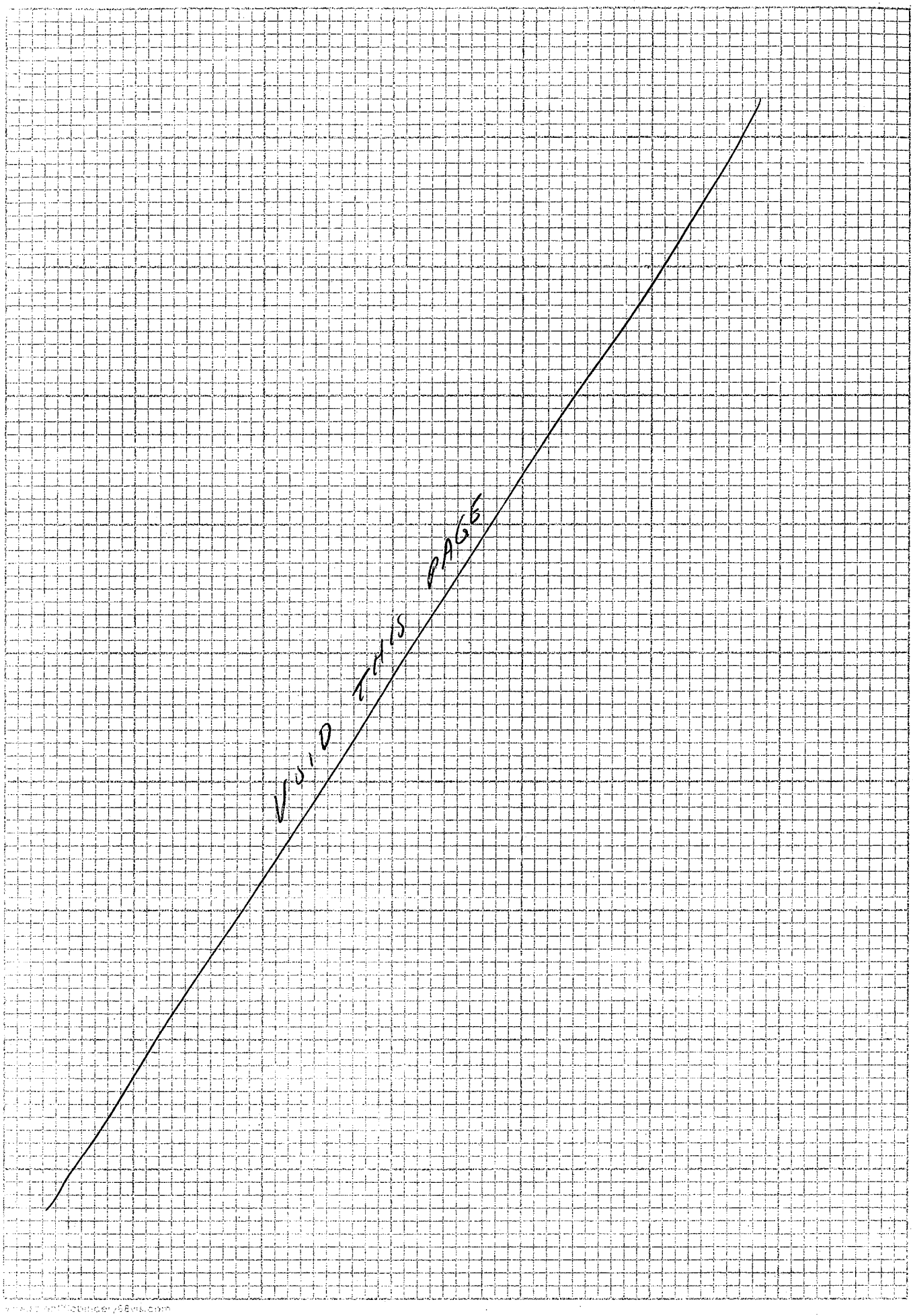
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0715 Hrs - ARRIVE @ MAIN GATE - obtain VEHICLE PASSES

0805 Hrs - ARRIVE @ FIELD TRAILER - UNLOAD EQ

0845 Hrs - LEAVE FOR N. CARROS OFFICE

0905 Hrs - talk to N.C. - he will bring out secondary containment for decon drum.

0945 Hrs - Return to FIELD TRAILER
PREP to GPS

1020 Hrs - GPS @ UXO12

1200 Hrs - BREAK FOR LUNCH

1235 Hrs - CON'T GPS @ UXO12

1430 Hrs - FINISH LAY OUT OF UXO 12 (10 SQ.I, 2 SEQ. & 1 SURFACE H_2O)

1445 Hrs - START GPS @ UXO 28
NO SUCCESS W/ SATELITES

1530 Hrs - END GPSing @ UXO28 no luck w/ satelites
RETURN to FIELD TRAILER

1545 Hrs - LEFT BASE FOR FED EX

1615 Hrs - PICK UP SAMPLE CONTAINERS (1st SHIPMENT)
and GEOPROBE SUPPLIES FOR OUX-10

1710 Hrs - PICK UP SUPPLIES @ LOWE'S

END

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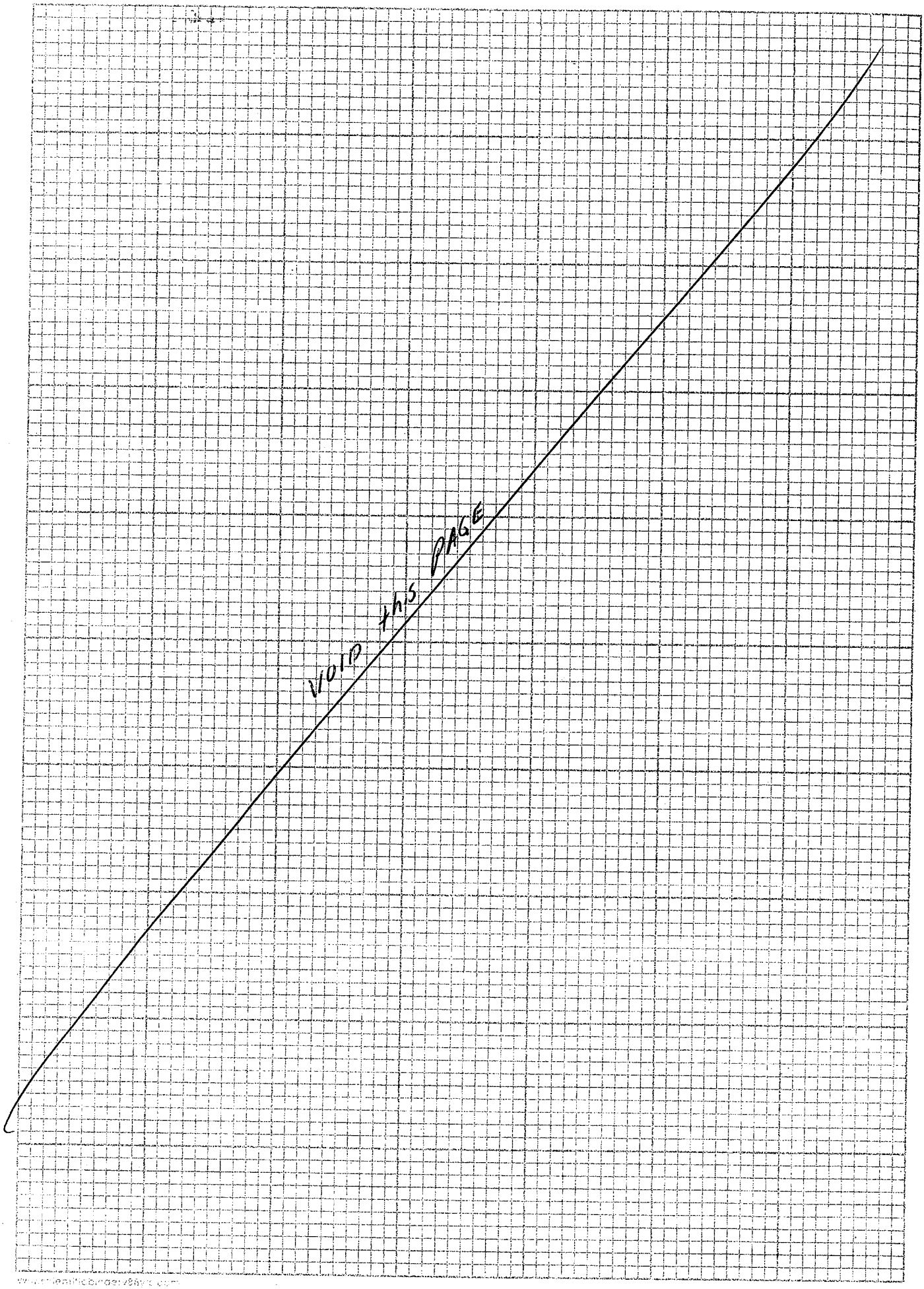

WED 1-20-10

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0630 Hrs - H&S MEETING @ HOTEL

0710 Hrs - ARRIVE @ FIELD TRAILER PREP TO GPS AREA UXO 28

1135 Hrs - LAY OUT All but 3 LOCATIONS @ UXO 28 [17 OF 20].

1140 HRS - LUNCH

1215 Hrs - PREP to SAMPLE SOILS @ UXO 28

1630 Hrs - STOP SAMPLING SOILS @ UXO 28 (SAMPLED (9 OF 20)

- CLEAN UP
- DUMP DECON WATER IN 55 GAL DRUM @ FIELD TRAILER

1715 Hrs - LEAVE SITE

1830 Hrs - PAPER WORK @ HOTEL & SAMPLE HANDLING / EMAIL GPS DATA

2000 Hrs - FINISH DAILY ACTIVITIES

END

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DATE 1-20-10

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THURS 1-21-10 SAMPLES SHIPPED ON
COCs 27358, 27360, 27361 & 27362

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0630 Hrs - H&S meeting @ Hotel

0720 Hrs - Arrive Field Trailer @ IH
- Prep to sample @ UXO-028

0800 Hrs - Arrive @ UXO-028

1245 Hrs - Finish sampling @ UXO-028

1300 Hrs - Return to Field Trailer
Process samples, collect source water blank & Rinsate, dump decon water in IDW drum

1600 Hrs - Leave site, call/check in w/ Pitt office & Lab
Cooler 6 coolers for Fri or Sat delivery

1630 Hrs - Arrive @ Hotel - Pack samples & Finish COCs

1800 Hrs - Drop off samples @ Fed Ex Ship samples w/a
Fed Ex AB# 8631 2526 3882

END

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DATE 1/21/10

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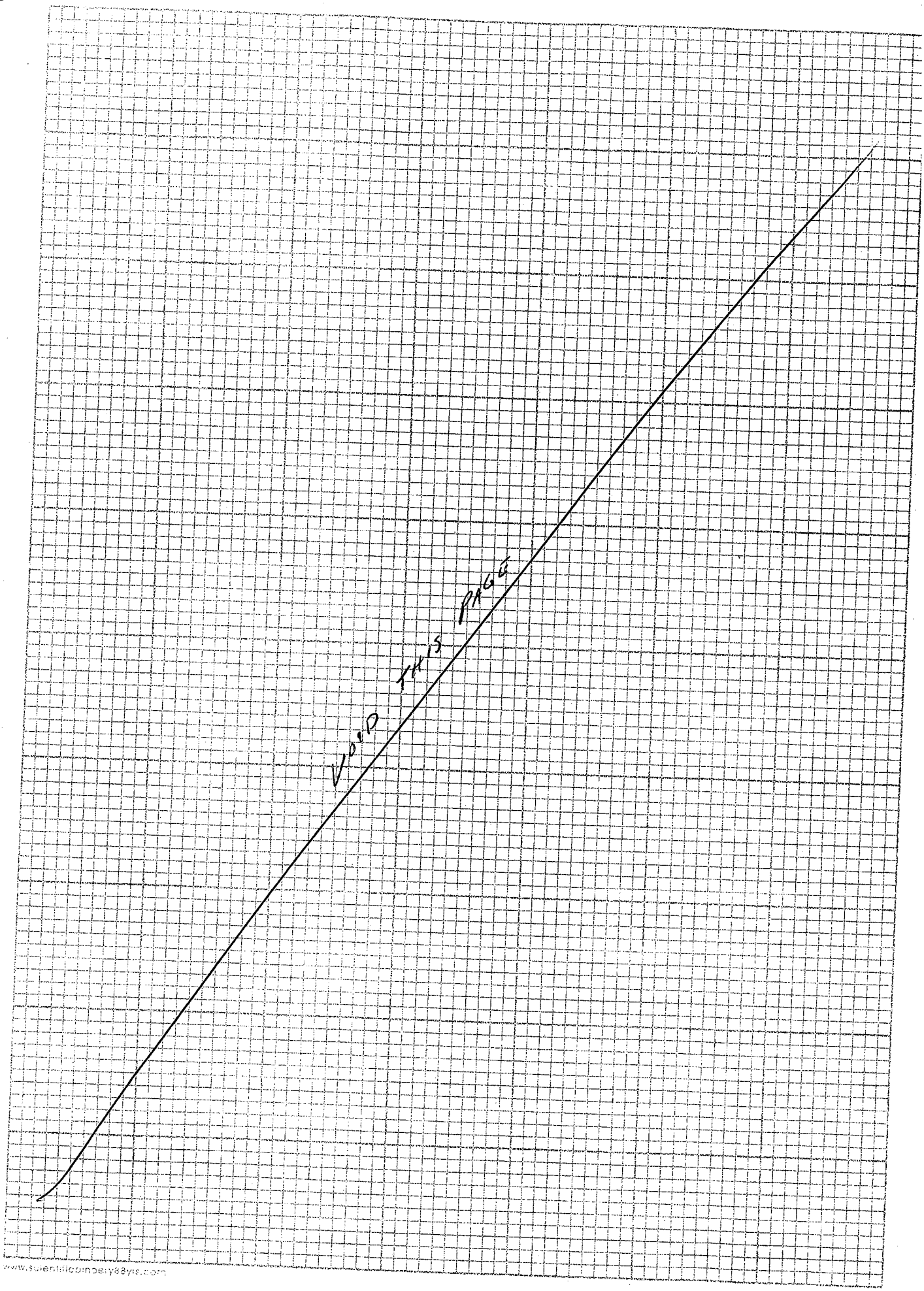

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Work continued from Page WEATHER - steady RAIN & MID 30°s

0630 Hrs - HE'S MEETING @ Hotel
0725 Hrs - ARRIVE @ FIELD TRAILER IH
0800 Hrs - BEGIN Layout @ UXO-05 (ADVANCED IED AREA)
Lay out 11 Locations takes dry out break @ 1035 Hrs
SB019 & 11 OFFSITE dug to hit w/ CABLE Locator
LUNCH @ 1230 - 1310 Hrs
1310 Hrs - Cont Lay out of SAMPLE locations @ UXO-05
Lay out (22 OF 25 Locations); 3 REMAINING
Locations ARE in RANGE 3 (will lay out those
& SAMPLE SURFACE soils OVER the WEEKEND)
1530 Hrs - Finish SAMPLE Location layout FOR this date
1600 Hrs - CHECK in with OFFICE (R. BASINSKI) & LAB (S. BAER)
1630 Hrs - PICK UP 2 SHIPMENTS @ FEDEX
1707 Hrs - PURCHASE SUPPLIES @ WAL/MART

END

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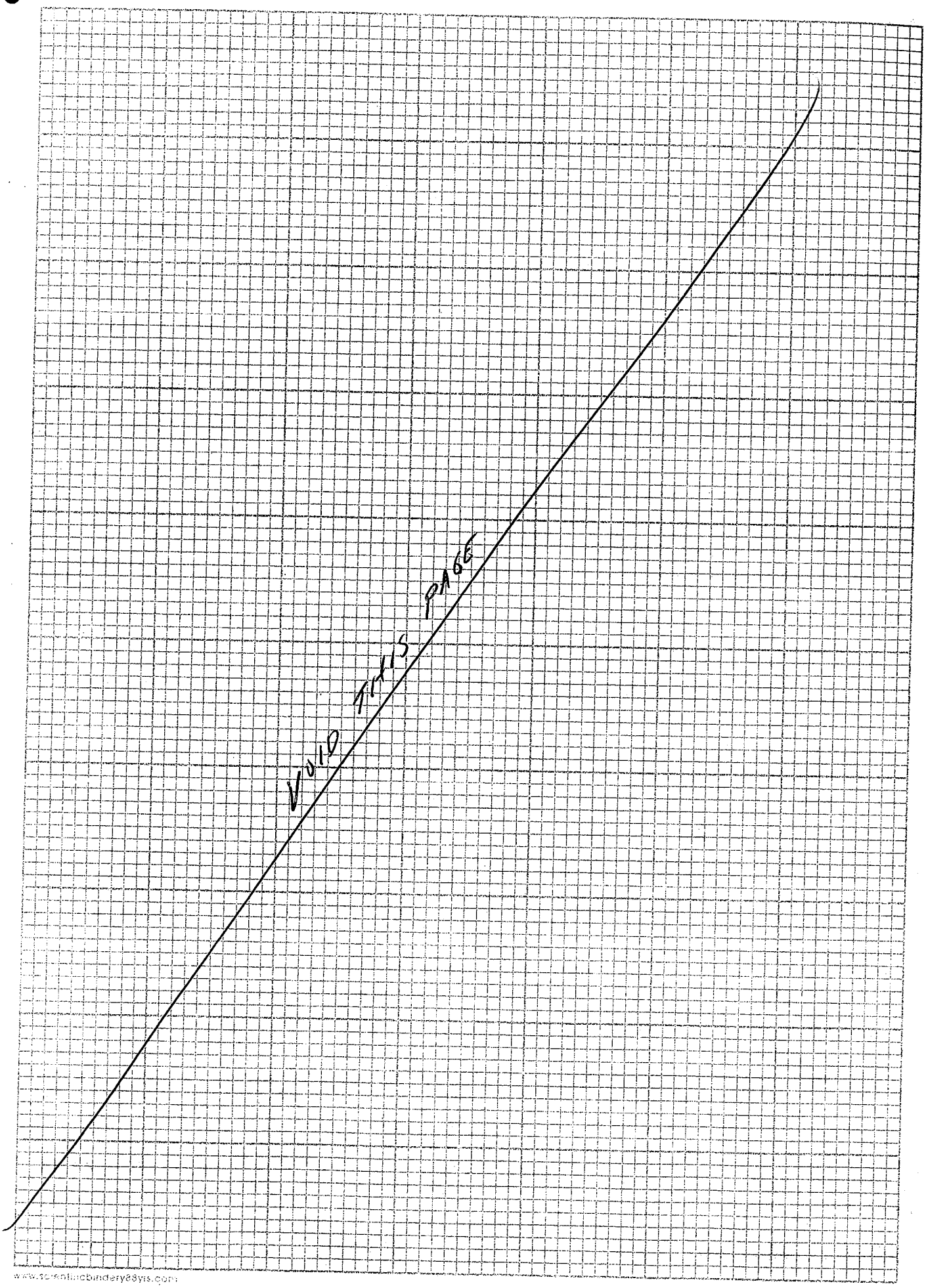

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0630 Hrs - H&S meeting @ Hotel

0720 Hrs - Arrive @ Field Trailer
- Prep to sample @ UXO-05

0830 Hrs - Arrive @ UXO-05
Collect samples @ 19 of 25 Locations

1600 Hrs - Finish Clean up @ UXO 05

1603 Hrs - Arrive @ Field Trailer - Check out after dropping off Decon Water

1630 Hrs - Leave Base for Hotel

END

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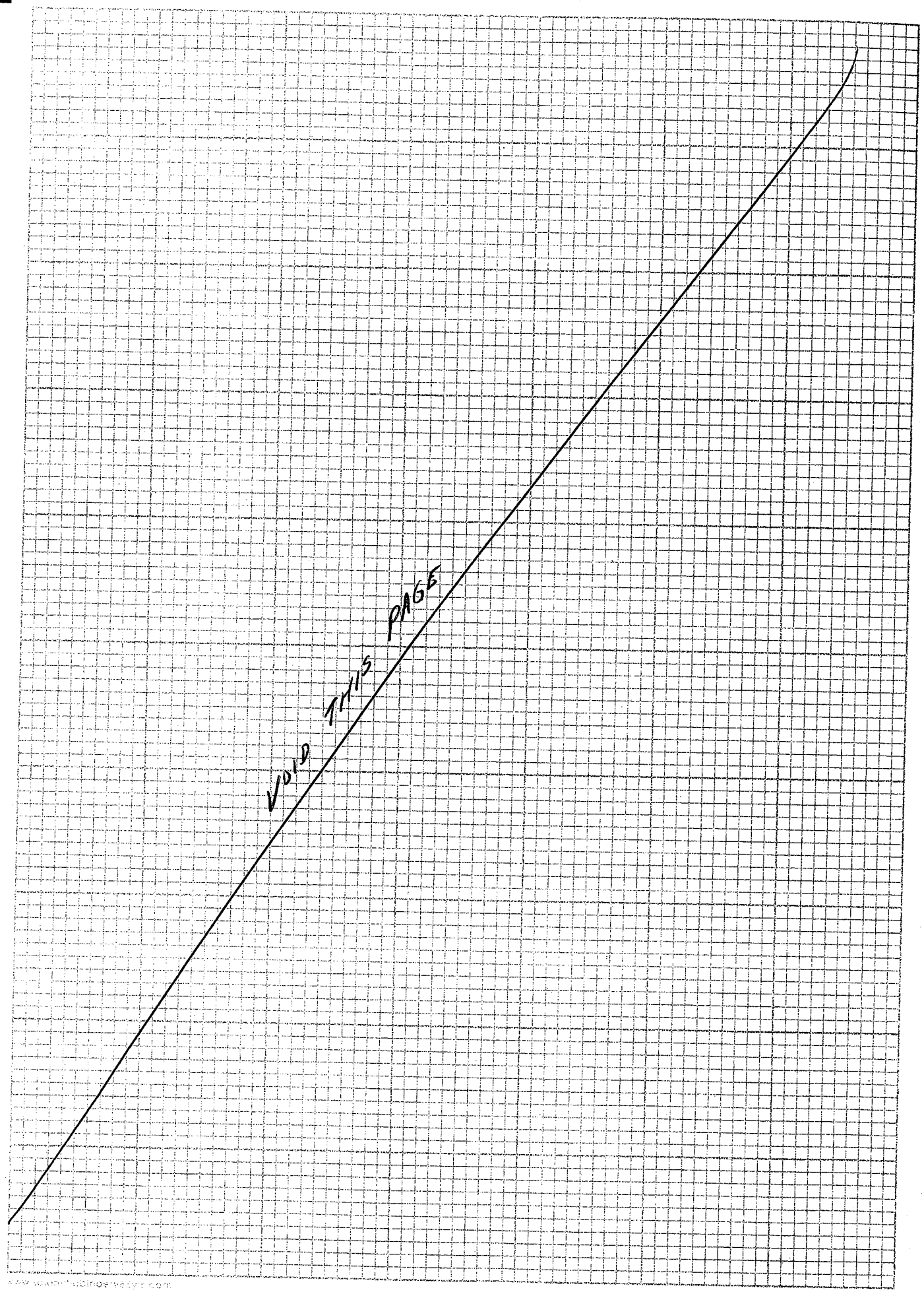
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TITLE NSF INDIAN HEAD SUN 1-24-10

PROJECT NO. 112G00810

BOOK NO. 1440

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0630 Hrs - H&S meeting @ Hotel

0715 Hrs - Arrive @ Field Trailer

- Collect Rinsate RB012410-01 & Water Blank WB012410-01
- Prep to collect Soils @ UXO 05 (Advanced IED Area)

0805 Hrs - Arrive @ UXO-05

Collect ~~6~~ (TR) ~~5A~~ samples from the 6 remaining sample locations 9, 10, 11, 14, 15 & 21

1030 Hrs - Finish clean up @ UXO 05

1035 Hrs - Return to Field Trailer

- Pick up sample processing supplies

1100 Hrs - Break for Lunch

1230 Hrs - Process samples Collect 1/23 & 24/10 Prep COCs

1700 Hrs - Finish Daily Activity

END

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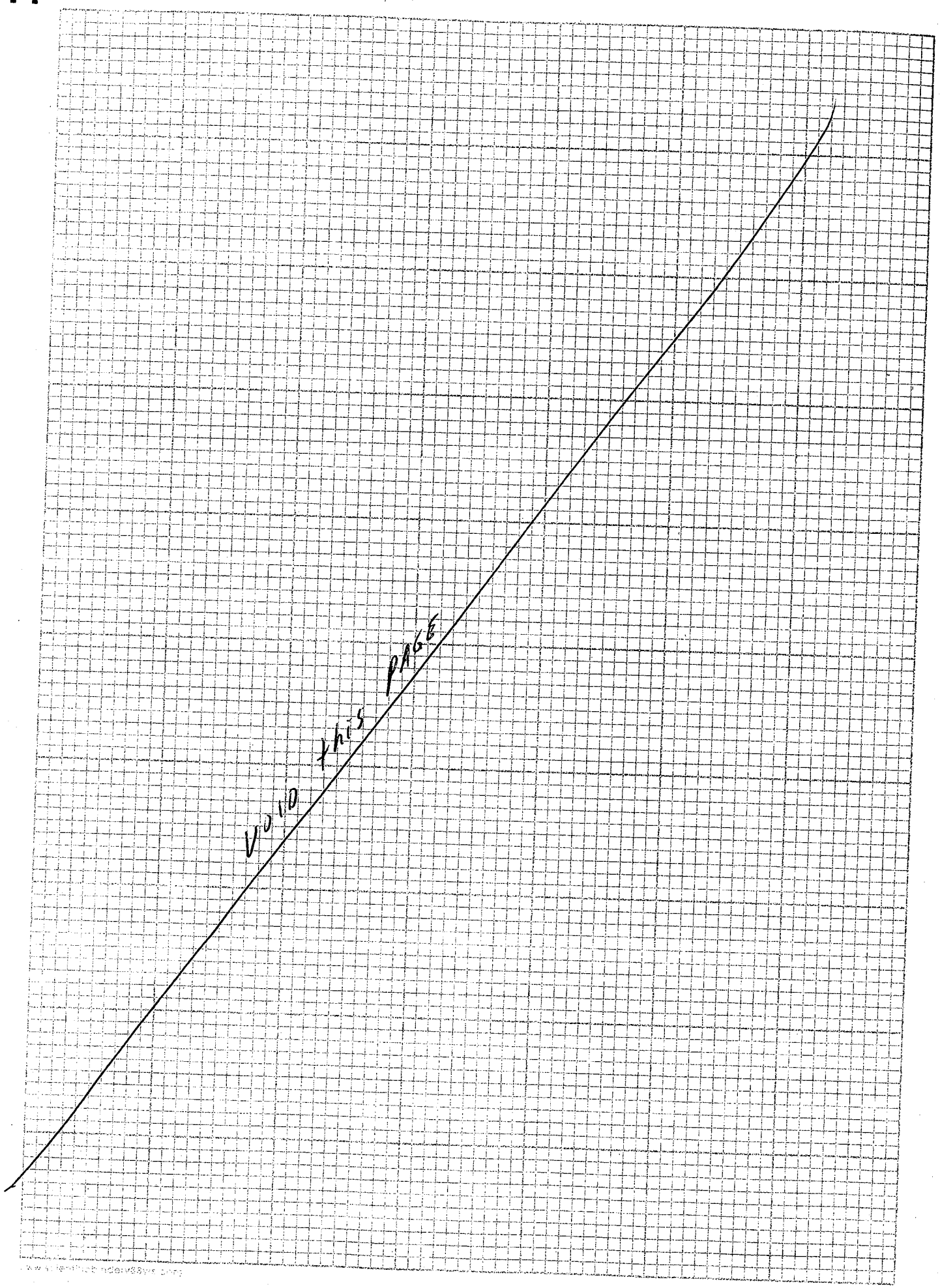
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Work continued from Page AM - Rainy PM - Mostly Sunny 40's

0630 Hrs - H&S meeting @ Hotel

0700 Hrs - Purchase ICE

0730 Hrs - Arrive @ Field Trailer

- Prep to sample @ UXO-10 (Stump Neck Impack Area)

0800 Hrs - Arrive @ UXO-10

- Layout and sample shallow samples @ Locations 002 & 003
- Unable to get deep samples w/ 60in sleeves & basket catch
- Work out another method to collect deep samples will be. and try this afternoon (Talk to R. Basinski)

1331 Hrs - Purchase EQ to go after deep samples - will push/hammer 3" PVC 5-6' into sediment and use hand auger to collect deep samples within the 3" PVC & pipe.

1430 Hrs - Return to UXO-10
Collect shallow and deep samples @ Location 010

1600 Hrs - Finish deep sample test; prep to leave Base

1651 Hrs - Purchase ICE; Prep samples on COCs 27363 through 27367 (5 COCs) for shipment this date via FEDEX AB# 8631 2526 4000 to Analytical Lab. Services

1800 Hrs - Drop off samples @ FED EX

END

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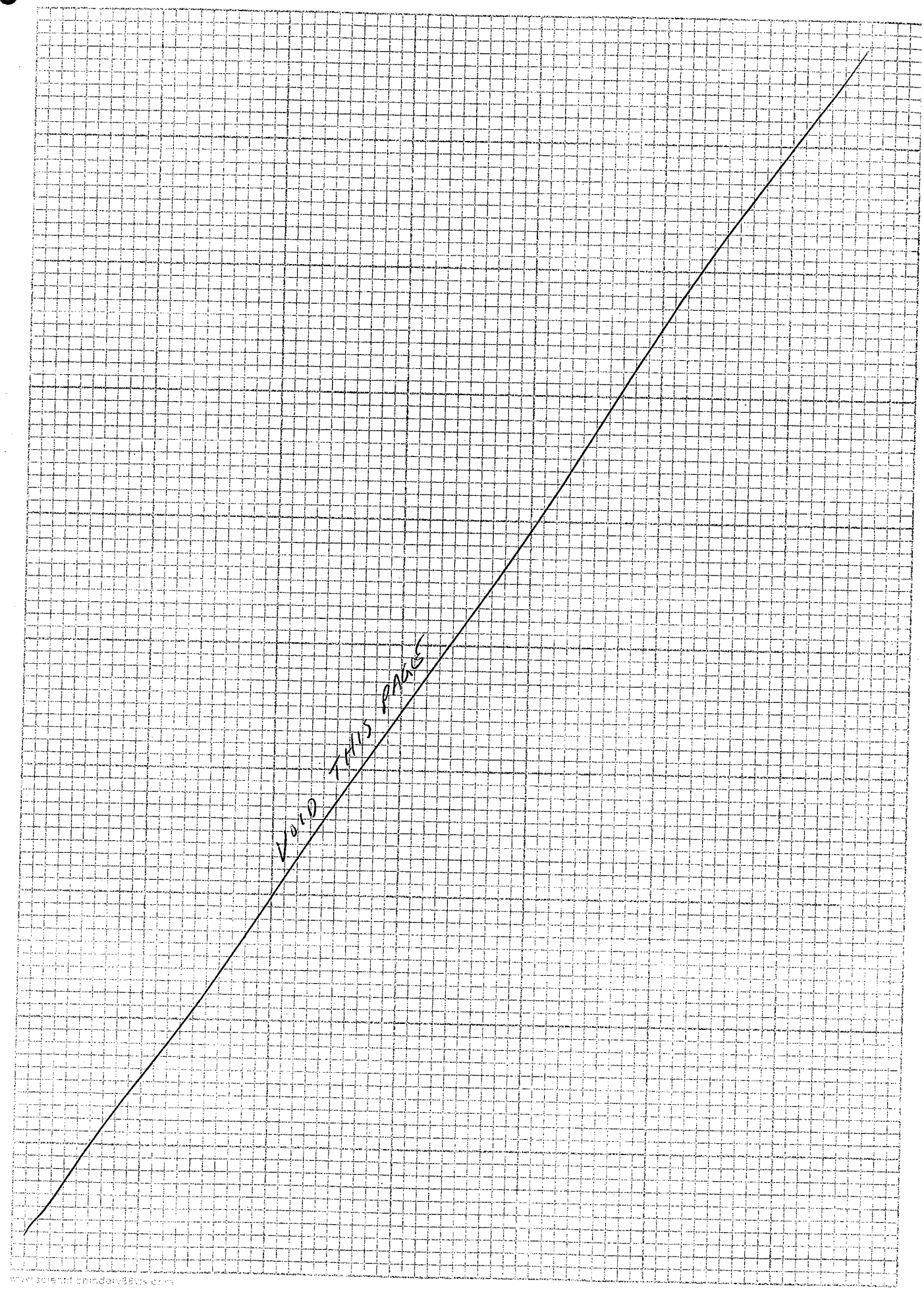
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WEATHER - PARTLY CLOUDY AND 40°S

0630 Hrs - H&S MEETING @ HOTEL

0720 Hrs - ARRIVE FIELD TRAILER

- PREP FOR SEDIMENT SAMPLING @ UXO 10 (STUMP NECK IMPACT AREA)

0820 Hrs - ARRIVE @ UXO 10

COLLECTED SAMPLES FROM 7 LOCATIONS. INCLUDING DEEP SAMPLES @ SD002 & 003, ALSO SAMPLE SD004, 005, 006, 007 & 001

1635 Hrs - ARRIVE @ FIELD TRAILER DROP OFF EQ, CLEAN UP, ETC

1700 Hrs - LEAVE SITE

1726 Hrs - PURCHASE SUPPLIES @ WALMART (LAPLATA)

END FIELD WORK

1900 Hrs - PROCESS SAMPLES, COCS GENERATED ETC.

2100 Hrs - END PROCESSING ETC

END

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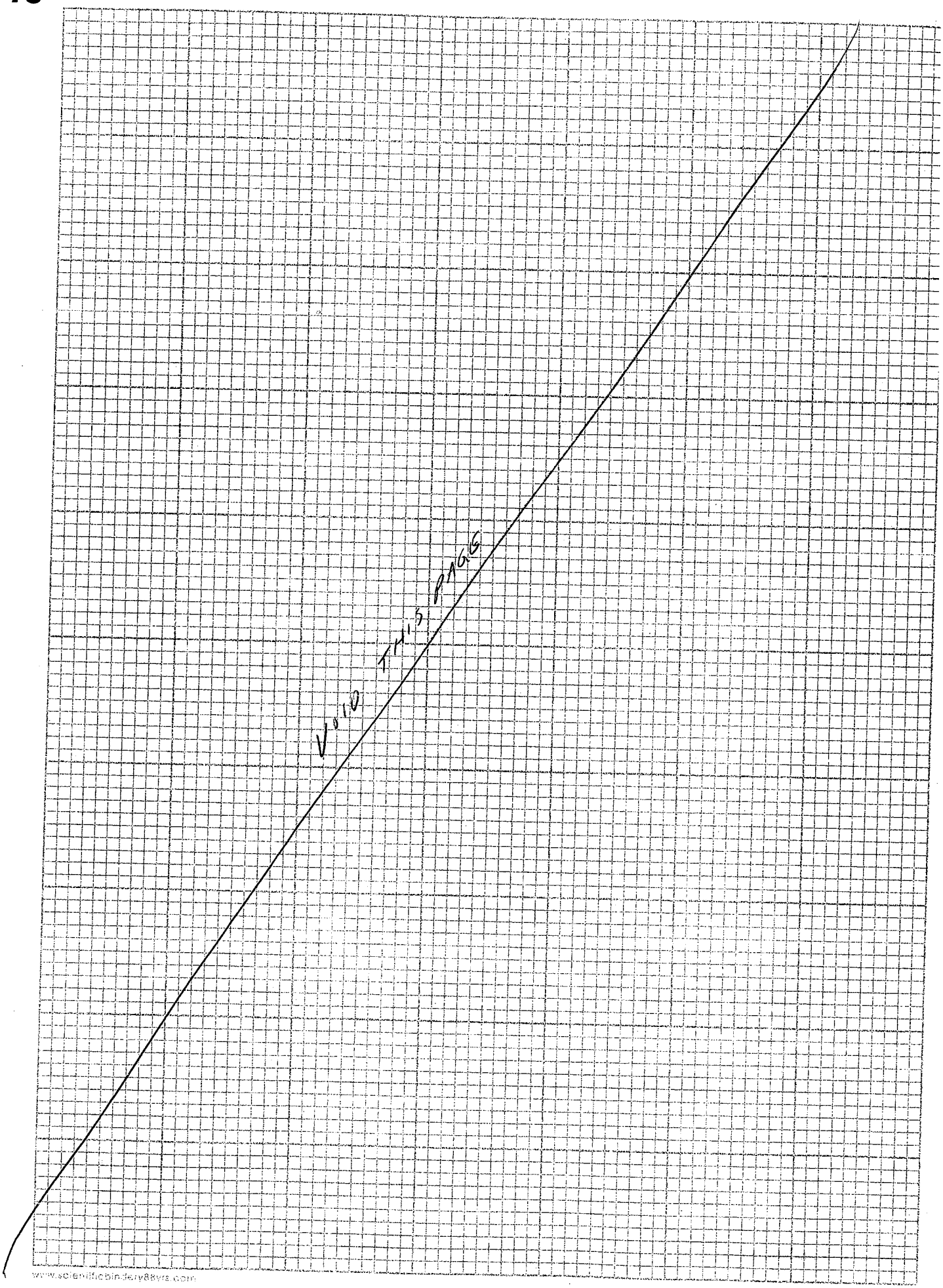

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TITLE NSF INDIAN HEAD WED 01/27/10

PROJECT NO. 112600 810

BOOK NO. 1446

Work continued from Page WEATHER - PARTLY SUNNY & 40's

0630 Hrs - M&S MEETING @ HOTEL

0720 Hrs - ARRIVE @ FIELD TRAILER
- PREP to SAMPLE IN AREA UXO-10
- SAMPLE @ 3 LOCATIONS (SD 011, 012 & 014)
- CREAT 9 GPS POINTS

1130 Hrs - FINISH CLEAN UP @ UXO-10
- PREP / HANDLE SAMPLES
- PACKAGE SAMPLES: COCs 27368, 27370, 27371 & 27372

1400 Hrs - DROP OFF SAMPLES @ FEDEX; SHIP SAMPLES to ANALYTICAL LAB SERVICES, MIDDLETOWN PA on AB# 863125263996

1930 Hrs - ARRIVE @ HOME
- UNLOAD RENTAL VEHICLE

2000 Hrs - DROP OFF RENTAL VEHICLE @ PIT AIRPORT

2020 Hrs - RETURN HOME

END

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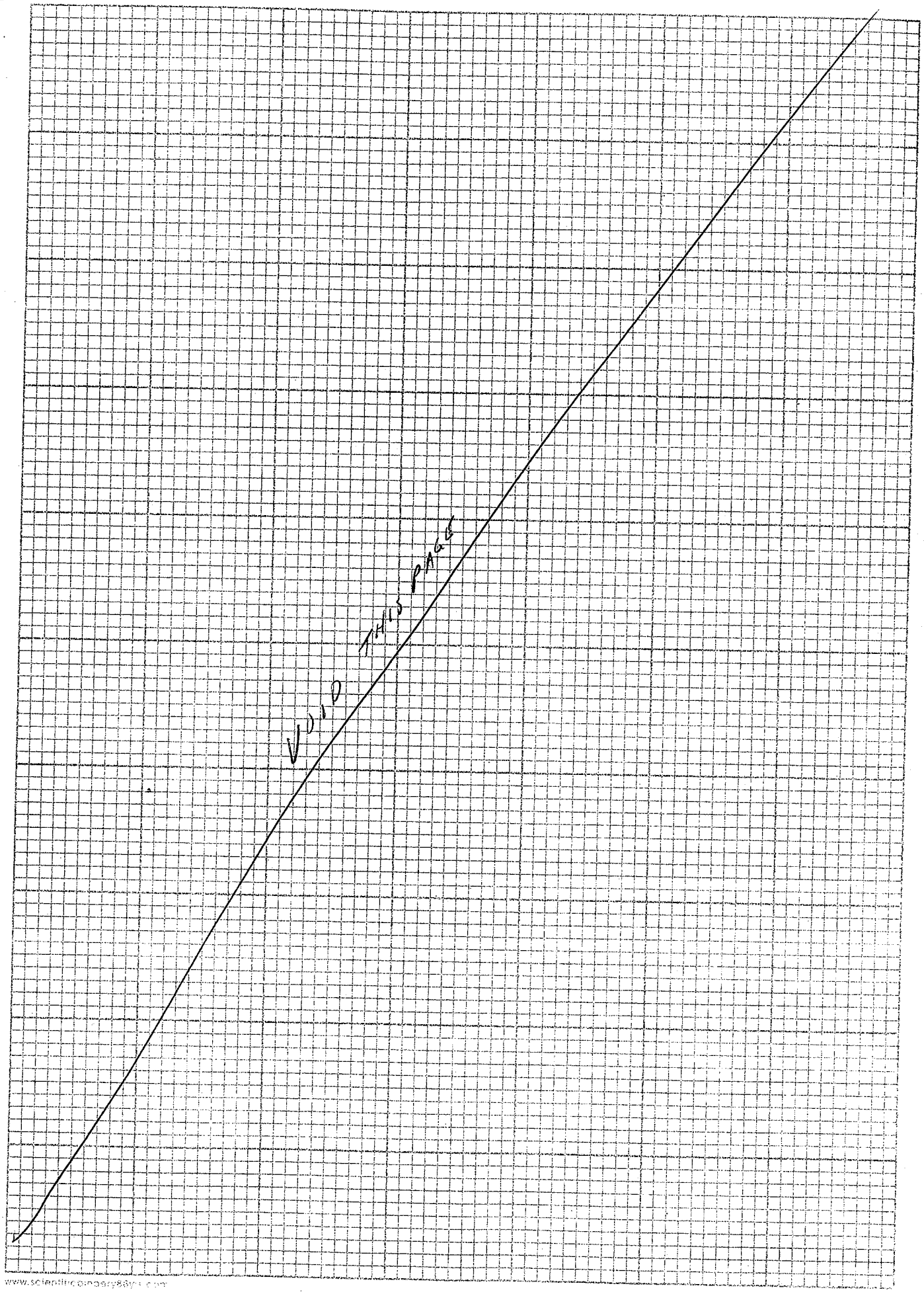

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CREW: FRED RAMSER, JASON BIRKETT & T. ROMANO

TITLE NSF INDIAN HEAD

PROJECT NO. 112G00810

BOOK NO. 1440

21

MON 2/01/10

Work continued from Page WEATHER - Partly Cloudy 40°s

0630 Hrs - LEFT Pittsburgh

1245 Hrs - ARRIVE MAIN GATE - OBTAIN VEHICLE PASS

1400 Hrs - DROP OFF EQ @ FIELD TRAILER
CHECK ON GPJ FILES, drillers, CHECK IN w/ N. CARLOS Etc.

1700 Hrs - PICK UP COOLERS & CONTAINERS @ FED EX

1725 Hrs - XEROX FIGURES @ FED EX KINKOS FOR utility clearance and N. CARLOS, Etc.

END

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SIGNATURE

DATE 2/01/10

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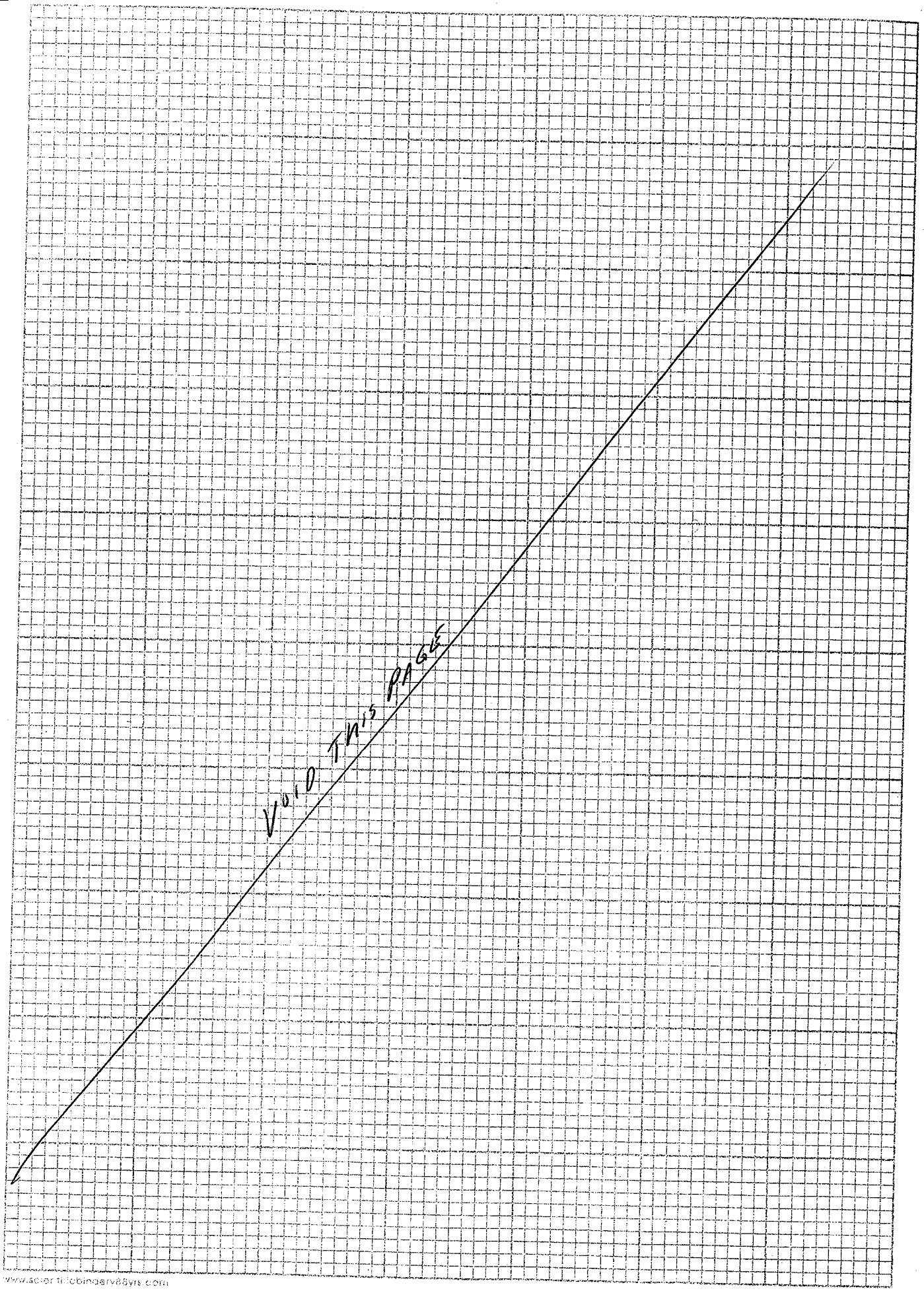

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CREWS - SAME AS ON 01

TITLE NSF INDIAN HEAD

PROJECT NO. 112G00810

BOOK NO. 1440

TUES 02-02-10

Work continued from Page WEATHER - Cloudy & cold AM 20°s PM 40°s

0630 Hrs - H&S meeting @ Hotel

0715 Hrs - Arrive @ Field ~~Site~~ (FM) Trailer

- Prep to collect SD samples @ UXO 10

0830 Hrs - Collect RB020210-01

0835 Hrs - Collect WB020210-01

0840 Hrs - Arrive @ UXO 10 (SAMPLE SD008 & 009)

1130 Hrs - LUNCH

1200 Hrs - Return to sampling @ UXO 10 (SAMPLE SD013 & 015)

1400 Hrs - Finish Clean up @ UXO 10 (MOB BOAT to Site 8)

- Prep samples for shipment on FED EX AB#

8631 2526 3985

1800 Hrs - Drop off samples on COCs 27373 & 27374 @ FED EX

END

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Work continued to Page

SIGNATURE

DATE 02-02-10

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CREW - SAME AS 2/01

TITLE NSF INDIAN HEAD

WED 02-03-10

PROJECT NO. 112G00810

BOOK NO. 1440

Work continued from Page

WEATHER - CLOUDY @ 30°s

0730 HRS - H&S MEETING @ HOTEL

0820 HRS - ARRIVE @ FIELD TRAILER

- PREP FOR SEDI. & SURFACE SOIL SAMPLING @ UXO02 (AREA 8)

0940 Hrs - ARRIVE @ UXO 02

Collect SAMPLES SD001-003; SS001, 002, 003, 004, 006 007 & 008

1215 Hrs - FINISH CLEAN UP @ UXO 02

- LUNCH
- PREP to SAMPLE POND @ UXO 02

1315 Hrs - ARRIVE @ UXO02 POND

Collect SEDI SAMPLES SD004-007

1500 Hrs - RETURN to FIELD TRAILER

- PROCESS SAMPLES

1736 Hrs - LEAVE SITE FOR HOTEL

1930 - 2130 Hrs - PAPER WORK @ HOTEL - PREP COCs, UPDATE LOG, ETC

END

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Work continued to Page

SIGNATURE Terry Hazel

DATE 2-03-10

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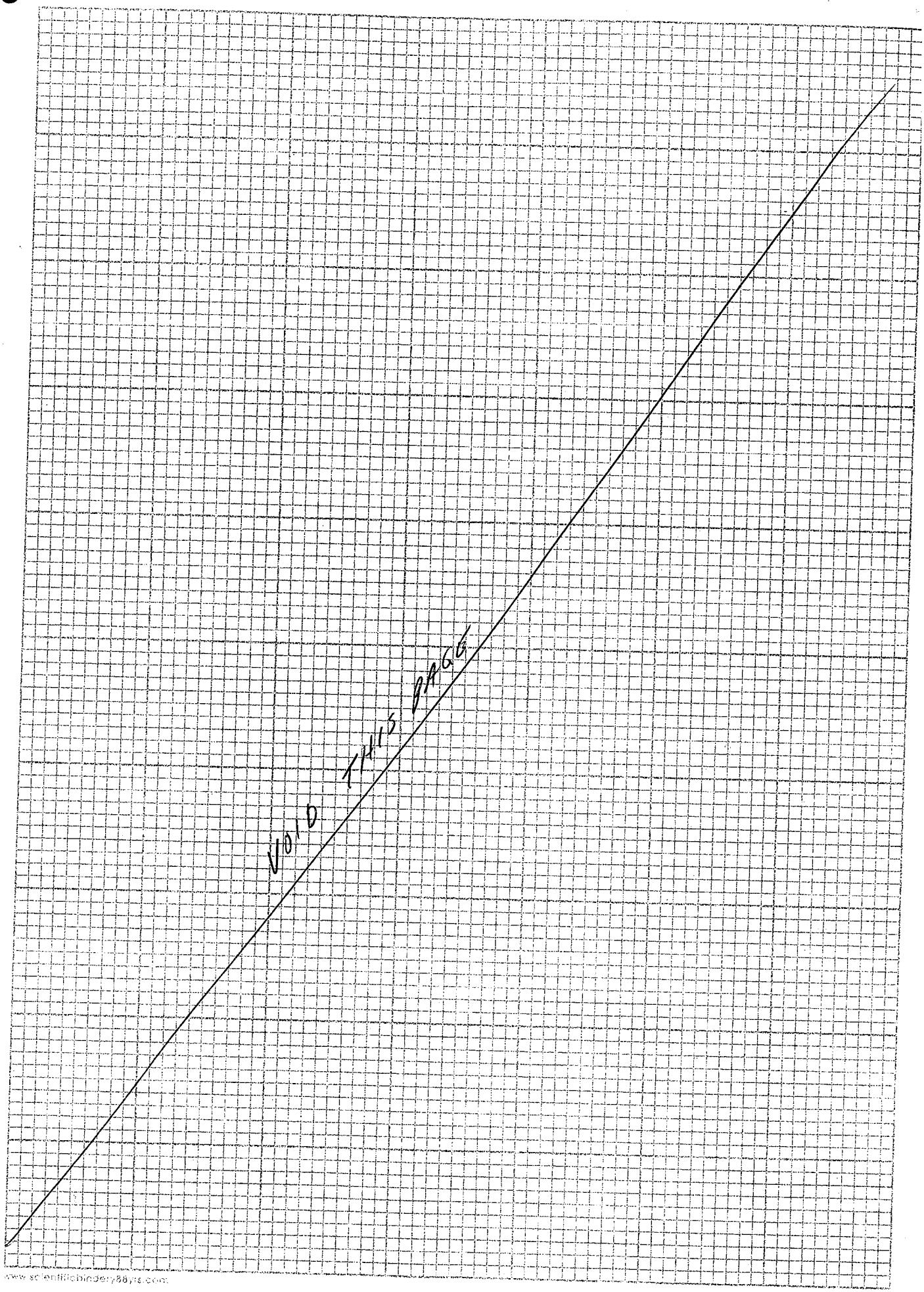

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Work continued from Page WEATHER - Mostly Cloudy ~ 30°s

0730 Hrs - H&S meeting @ Hotel

0815 Hrs - Arrive @ Field Trailer

- Prep to collect surface soil @ UXO 02 (Area B)

0915 Hrs - Arrive @ UXO 02

Collected surface soil composite samples from 22 soil boring locations

1455 Hrs - Finish sampling @ UXO 02 for this date

1500 Hrs - Arrive @ Field Trailer

- Process & package samples for shipment via FedEx AB# 8631 2526 3974 on COCs 27375 → 27380

1835 Hrs - Drop off 3 coolers @ FedEx for delivery to Analytical Lab Services on Fri 2/05

END

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Work continued to Page

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DATE 2-04-10

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Work continued from Page

TRAVEL day due to large SNOW STORM to hit this AFTERNOON !!!

Will RETURN WHEN ROADS ARE PASSABLE

END

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DATE 2-05-10

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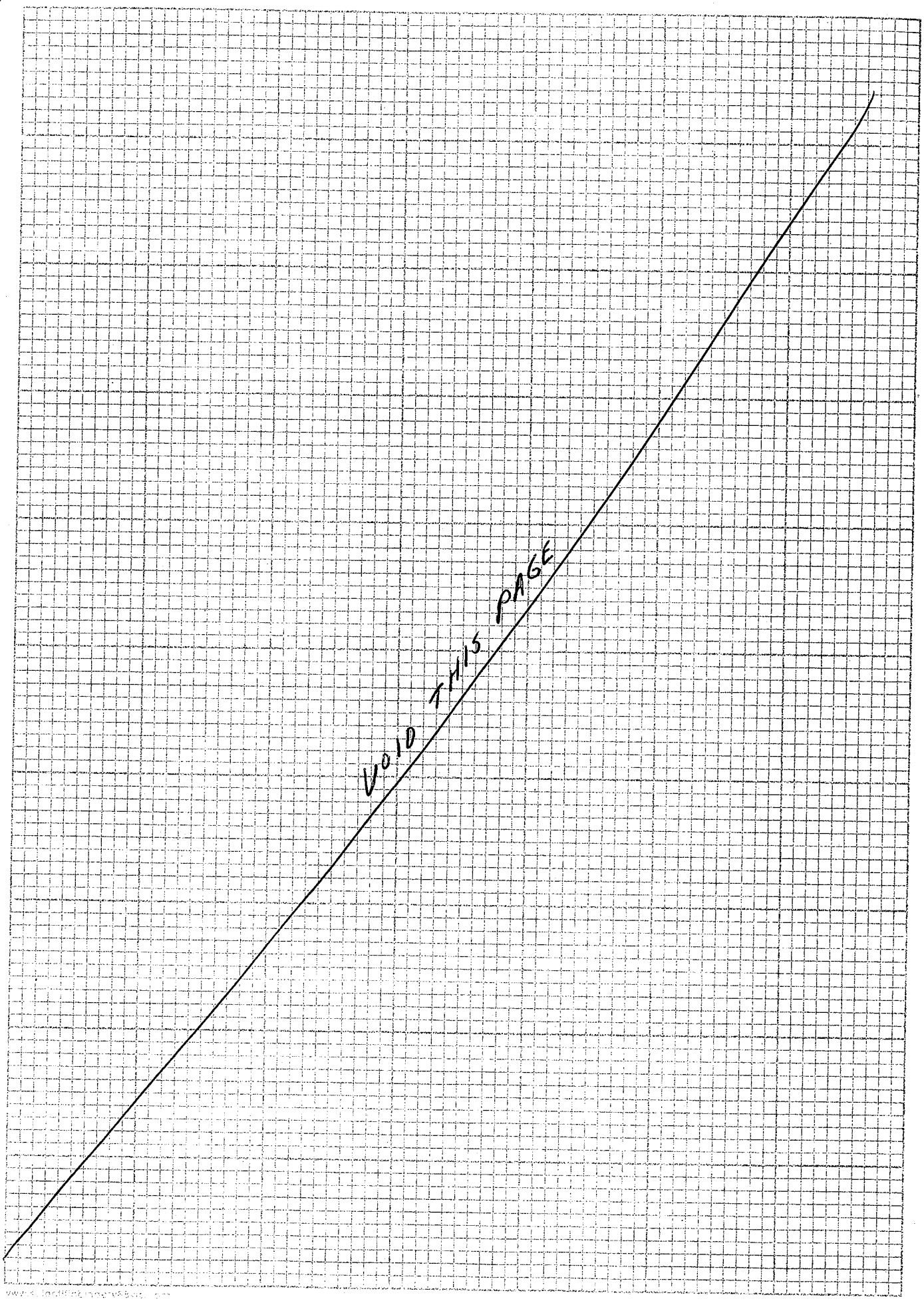
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DPT CREW - SEE NOTE BOOK # 2610 (ELLEN BERKLITE) PAGES 31-37
UXO CREW - F. MONTES (W/DPT) & B. CARNIAL (W/SURFACE SOIL CREW)

TITLE NSF INDIAN HEAD

PROJECT NO. 112G00810

BOOK NO. 1440

MON 3-15-10

Work continued from Page

RECEIVING this log book - MONDAY EVENING 3/15/10
SEE SAMPLE SUMMARIES IN NOTE BOOK # 2670
FOR INFO FROM 3/9 - 3/15/10, PAGES 7-25.

END

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Work continued to Page

SIGNATURE Terry Hazel

DATE 3-15-10

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TUES 3-16-10

SAMPLE SUMMARY:

Collected:

- 6 OF 6 DEEP SAMPLES (2'-4') @ UX001
- 1 OF 20 SURFACE SOIL SAMPLES @ UX001
- FINISH SAMPLING TEMP WELLS @ UX002
- 1 OF 20 DEEP SAMPLES (2'-6') @ UX004
- SHIP ALL SAMPLES COLLECTED THIS DATE

CREWS SEE PAGE 31

TITLE NSF INDIAN HEAD
THES 3-16-10

PROJECT NO. 112G00810
BOOK NO. 1440

Work continued from Page

@710 Hrs - ARRIVE @ FIELD TRAILER
- CALL WATER METERS
- HELP S. CAMRON PREP to SAMPLE GW WELLS
- TAIL GATE H&S MEETING
- PREP PACKETS OF VOLATILES (2 $NaHSO_4$ & 1 MeOH/PACKET) FOR E. BEARLITE
- COLLECT RINSATES & WATER SOURCE SAMPLES (QA/QC)
- PREP PAPERWORK

1330 Hrs - PREP to SAMPLE SURFACE SOILS @ UXO 01
COLLECT SAMPLES @ 11 OF 20 SAMPLING LOCATIONS

1540 Hrs - STOP SURFACE SOIL SAMPLING (TR & S.C)

1600 Hrs - RETURN to FIELD TRAILER, PREP SAMPLES FOR SHIPMENT ON COCS 27405, 27407 & 27409 FOR UXO 01, 27410-27412 FOR UXO 04 & 27414 FOR UXO 02 to Analytical Lab Services VIA FED EX AB# 8631 2526 7708

1910 Hrs - DROP OFF SAMPLES @ FED EX

END

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Work continued to Page

SIGNATURE Tony Royal

DATE 3-16-10

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WED 3-17-10

SAMPLE SUMMARY

COLLECTED:

- REMAINDER OF UXO 04 DEEP SAMPLES (2'-6')
- REMAINDER OF UXO 01 SURFACE SAMPLES
- 12 OF 20 SURFACE SOIL LOCATIONS @ UXO 04

ALSO:

- ABANDONED ALL TEMP WELLS @ Study Area 8
- MOB ALL DRUMS TO BUR PIT
  (4 H_2O #S 1→4 & 2 Soil Cuttings #S 5&6)
- DRILLERS FINISH DEEP LOCATIONS and DEMOB
- GPS 20 OF 20 @ AIR BLAST POND
- GPS 12 OF 20 @ BASIC TED
- DPT CREW DEMOB

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CREWS SEE PAGE 31

TITLE NSF INDIAN HEAD

PROJECT NO. 112G00810

BOOK NO. 1440

WED 3-17-10

Work continued from Page

0715 Hrs - ARRIVE @ FIELD TRAILER
- o PREP to SAMPLE SURFACE SOIL
- o H&S tailgate
- o SAMPLE 9 SOIL BORING LOCATIONS @ POINT BLAST AREA LIXO 01

1230 Hrs - LUNCH

1315 Hrs - SAMPLE 12 OF 20 SOIL BORING LOCATIONS @ BASIC IED AREA LIXO 04

1700 Hrs - RETURN to FIELD TRAILER
- o CLEAN UP

1800 Hrs - LEAVE FIELD TRAILER FOR HOTEL - PAPERWORK @ HOTEL

END

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SIGNATURE Tom Boyd

DATE 3-17-10

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WITNESS

DATE

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THURS 3-18-10

SAMPLE SUMMARY

COLLECTED:

SURFACE SOIL SAMPLES @ 8 OF 20 LOCATIONS @ UXO 04

(2) SEDIMENT SAMPLES & (1) SURFACE WATER SAMPLE @ UXO 12

ALSO:

FINISHED GPSing UXO 04

DEMOB SITE TRAILER (EQ & SUPPLIES)

Work continued from Page

0730 HRS - ARRIVE @ FIELD TRAILER
° PREP to SAMPLE SURFACE SOILS
0845 HRS - ARRIVE @ UXO-04 BASIC IED
COMPLETE SURFACE SOIL SAMPLING 8 OF 12 LOCATIONS
COMPLETE GPSing SOIL boring LOCATIONS
1245 HRS - FINISH CLEAN UP @ UXO 04
1300 HRS - PREP to SAMPLE SURFACE WATER and SEDIMENT @ UXO 12
TORPEDO BURIAL SITE
COMPLETE SAMPLING @ UXO 12 with the COLLECTION OF
X12SW001, X12SD001 & X12SD002
1400 HRS - RETURN to FIELD TRAILER
PROCESS SAMPLES and PREP SAMPLES FOR SHIPMENT ON COCs
27413, 27419-27421, 27416-27417 & 27422
UXO 04 UXO-01 UXO 12
FOR SHIPMENT to ANALYTICAL LAB SEA via FED EX
AB# 8631 2526 3993
1815 HRS - S.C & E.L. LEAVE SITE FOR FED EX; TR REMAINED @
TRAILER to DEMOB EQ & SUPPLIES
1995 HRS - TR FINISHED DEMOB @ NSF INDIAN HEAD
END

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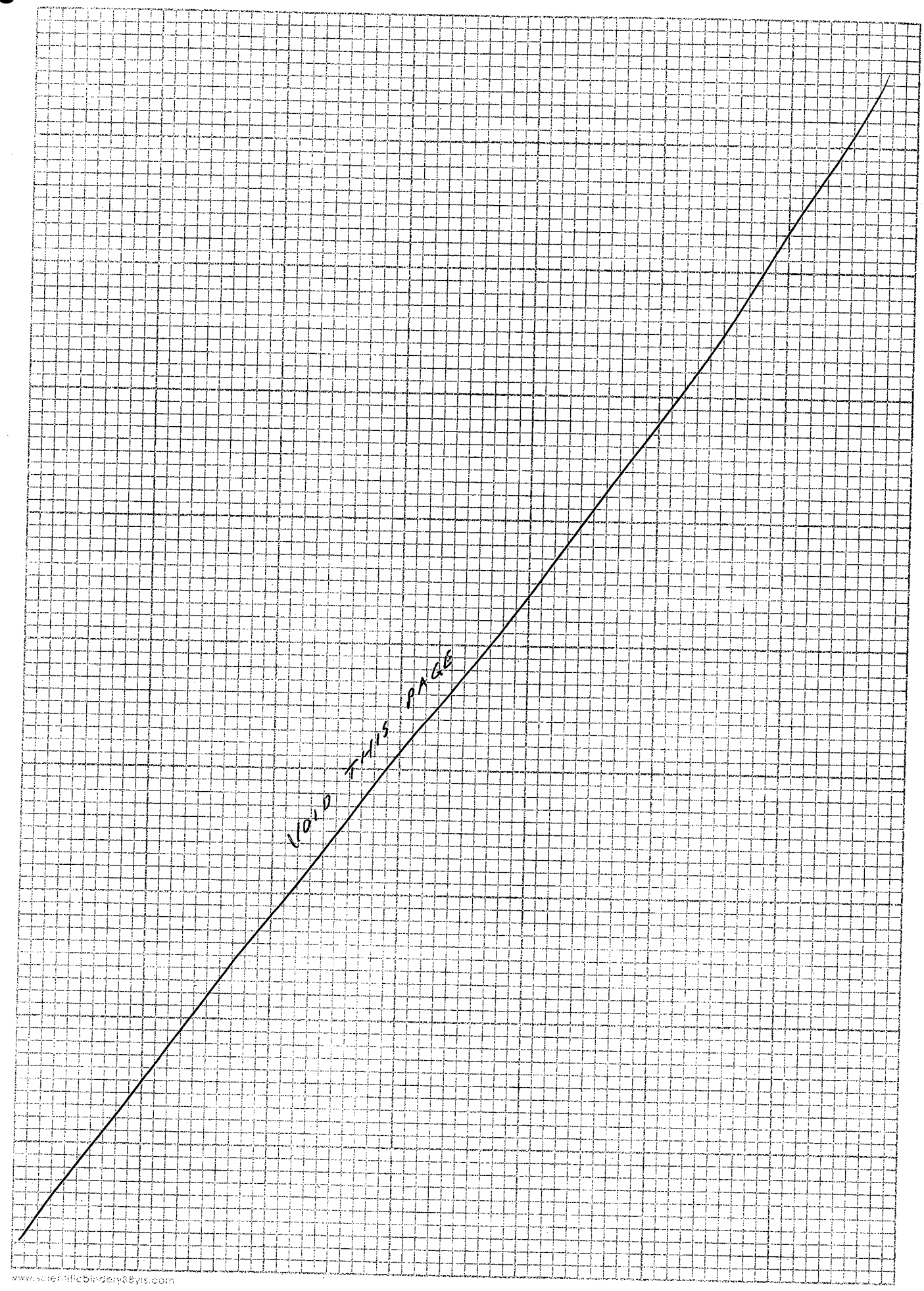

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- TRAVEL DAY FOR S. CAMERON, E. BERKLITE & T. ROJAHN
- CLEAN TRAILER & TRAILER SITE - FRANK MONTES & BRUCE CAKNAL

END

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Work continued to Page

SIGNATURE Tony Rojahn DATE 3-19-10

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APPENDIX F.25

FIELD BOOK 2

JOHN WRIGHT: 724 493 6309

MRP STUMP NRCR

TITLE

PROJECT NO.

BOOK NO.

2-2-10

Work continued from Page

0630	TAIL GATE MTG + MC SAMPLING TEAM - FRED WRAMSER - TERRY ROJAN - JAKE BIRKETT + LV HOTEL TO STUMPNRCR
0730	ON SITE + DISCUSS SITES TO BE MARKED FOR DPT & SURFACE LOCATIONS + TARGET - 1) UXO-2 AREA 8 MARK SOHA WILL ESCORT FOR 2) BASIC IED (UXO-4) 3) TORPEDO DISPOSAL AREA UXO 23
1200	FINNISH STAKING XO2SB016 THRU XO2SB040
1400	FINNISH STAKING XO2SB001 → SB015 COMPLETED MARKING UXO 2 AREA 8.
1530	FOR + MARK SOHA COMPLETED STAKING TOP UXO 23

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SIGNATURE DATE

WITNESS DATE

TITLE

PROJECT NO.

BOOK NO.

Work continued from Page

1600 | CONTACTED ULRICK, GREG
MEET @ 1000 AM ON MAIN SIDE

+ GAVE FIGURES TO TRANS FOR
NK NICK C.

1630 | FWC DEPARTS MAIN SIDE
+ CONTACTED GREG ULRICK
– PLAN TO MEET AT MAIN
SIDE TO-MORROW @ 1000 - 1030

SUMMARY:

+ STAKED – UXO 2
– UXO 23

TO-MORROW PLAN
TO STAKE UXO 4
(BASIC IED)

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Work continued to Page

SIGNATURE | DATE

WITNESS | DATE

TITLE

PROJECT NO.

BOOK NO.

2-310

Work continued from Page

0730 | MTG W/ H+S TAIL GATE
MTG.

0815 | ARR AT STUMP NECK
FIELD OFFICE

–

1100 | COMPLETED STAKING OUT
DPT/SBG 001 → 020 @ ~~001~~ UXO

LV. STUMP NECK FOR MAIN
SIDE TO GET UTILITY CONTRACTOR

1145 | RETURN FROM MAIN SIDE W/
ENVIROSCAN CRAIG ULRICH

+ MARK SOHA (UXO) ESCORTED CRAIG
ULRICH UTILITY CLEARANCE
– PROVIDED MAPS AND DISCUSS
PRIORITIES.

1230 | FWC WILL HELP TR, J. BURKETT
BRUCE C. TO COLLECT SED/WATER
FROM POND @ UXO 2 ARR 8,

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Work continued to Page

SIGNATURE | DATE

WITNESS | DATE

TITLE

2-3-10

PROJECT NO.

BOOK NO.

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Work continued to Page

SIGNATURE

DATE

WITNESS

DATE

TITLE

2-4-10

PROJECT NO.

BOOK NO.

Work continued from Page

0730 TAIL GATE SAFETY MEETING LV HOTEL FOR SITE

0815 ARR AT FIELD TRAILER

- UTILITY CLEARS CONTRACTOR GREG ULRICH ON SITE WILL CLEAR PTS @ AREA 8 AND ADVANCE TO SITE

- FWR WILL ASSISTS TERRY R + JACOB BIRKETTE SAMPLING SOILS @

- CONTACT SUSAN YEAST

DISCUSS SCHEDULE W/ UXO UNABLE TO PROVIDE ADDITIONAL ESCORT FRIDAY ONLY ONE AVAILABLE CAUSE STAFF NEED TO TAKE 8-HOUR REF.

- PLAN TO WRAP FIELD WORK COB 2-4-10

- START NEW 10-DAY SHIFT MON.

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Work continued to Page

SIGNATURE

DATE

WITNESS

DATE

TITLE

PROJECT NO.

BOOK NO.

Work continued from Page

1000 CHANGE IN SCHEDULE:
+ CONTACTED RALPH BASINSKI
- OK w/ WORK STOPPAGE THIS COMING WEEKEND.
- PLAN TO BUG OUT ~~AM~~ TOMORROW MORNING
+ TALKED w/ SUESAN YATES OK TO CLEAR SITE TO DAY
+ TALKED TO BRENDAN GERBER PLAN TO MOB MONDAY FOLLOW UP w/ NICK C. TO CONFIRM BADGE ACCESS.

PWR ACTIVITIES:
+ MARK OUT LOCATIONS AT
- AIR BLAST POND (UX01)
- TEST AREA 1 (UX021)

1300 FWR COMPLETED MARKING OUT 20 POINTS AROUND THE DISH AT TEST AREA 1 (UX021) THE CENTER POINT WILL BE CHOSEN WHEN SAMPLED

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Work continued to Page

SIGNATURE

DATE

WITNESS

DATE

6

TITLE

PROJECT NO.

BOOK NO.

3-9-10

Work continued from Page

E.B.

3-9-10: (Ellen Berkhite - Tetra Tech NUS)

1400 - Met with Vironex drillers, William and Justin.
Went over details of the job and the HASP with Vironex, Stuart Cameron - TTNUS, Terry Rojan - TTNUS, E.B. - TTNUS

1500 - Inspected Rig - Everything checked out.

1600 - Went to Lowes to get supplies.

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Work continued to Page

SIGNATURE Ellen Berkhite

DATE 3-10-10

WITNESS

DATE

7

TITLE

PROJECT NO.

BOOK NO.

3-10-10

Work continued from Page

6:45 A.M. – Met at gate to get clearance passes.
Tetra Tech: Terry Rojahn
Ellen Berkhtte
Stuart Cameron
Vironex: William
Justin
Tetra Tech: Frank Montes
(UXO) Bruce Carnal

Met with Nick Carros 7:25-7:45 A.M.
Went over pass details for the weekend and the locations of the Eagles Nests at Area 6 –

Frank will accompany E.B. + Vironex
Bruce will accompany Terry + Stuart

Picked up Supplies.

Met at trailer @ 8:10 A.M. –
Port-o-John is missing, so reordered one.

UXO Safety Briefing by Bruce Carnal

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Work continued to Page

SIGNATURE Ellen Berkhtte

WITNESS

DATE 3-10-10

DATE

TITLE

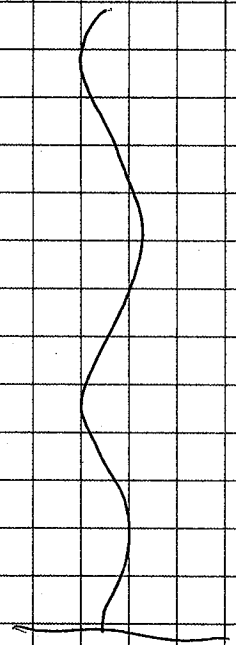
PROJECT NO.

BOOK NO.

3-10-10 Cloudy, 46°F

Work continued from Page

After gathering supplies, mobilized to Torpedo Burial site for DPT work. Found best route through woods.
Completed DPT subsurface sampling.
Returned to trailer @ 1530 and sorted out COCs and Sample Labels for Torpedo Burial and UXO 02.
Prepared everything with Terry + Stuart for shipping samples from both sites via FEDEX. Left site @ 1810.



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Work continued to Page

SIGNATURE Ellen Berkhtte

WITNESS

DATE 3-10-10

DATE

TITLE NSF INDIAN HEAD PROJECT NO. 112G00810

BOOK NO. 2670

ED 3-10-10

Work continued from Page

SAMPLE SUMMARY:

COMPLETED SURFACE SOIL SAMPLING @ UXO 2 (Study Area 8) AND COMPLETED SOIL SAMPLING @ UXO 12 (TORPEDO BURIAL SITE)

SHIPPED SAMPLES this date on COCs 27381 - 27384. to ANALYTICAL LABS VIA FED. EX AB# 8631 2526 7720

END

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Work continued to Page

SIGNATURE Tony Capt

WITNESS

DATE 3-10-10

DATE

TITLE

PROJECT NO.

BOOK NO.

3-11-10 Party Sunny 55°F

Work continued from Page

0700: Met Vironex Crew, UXO team, and Tetra Tech Personnel (Same) at trailer. UXO Leader (Bruce Carnal) completed Daily Safety Briefing.

0900: Mobilized w/ DPT rig to Torpedo Casing Site.

0120: Completed DPT subsurface sampling and returned to trailer.

1200: Mobilized w/ DPT rig to Test Area 8

1230: DPT rig blew hydraulic hose, returned to trailer and Vironex spent the rest of the afternoon repairing hose.

1230-1300: Met with T. Rojan on new task of logging the surface composite samples collected by Terry + Stuart in the morning, and preparing samples from both sites for shipping (labeling, getting ice, etc.) Continued with this task when they returned with more samples in the afternoon.

1740 Left Trailer

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Work continued to Page

SIGNATURE Ellen Berkelite

WITNESS

DATE 3/11/10

DATE

TITLE NSF INDIAN HEAD

PROJECT NO. 112600810

BOOK NO. 2670

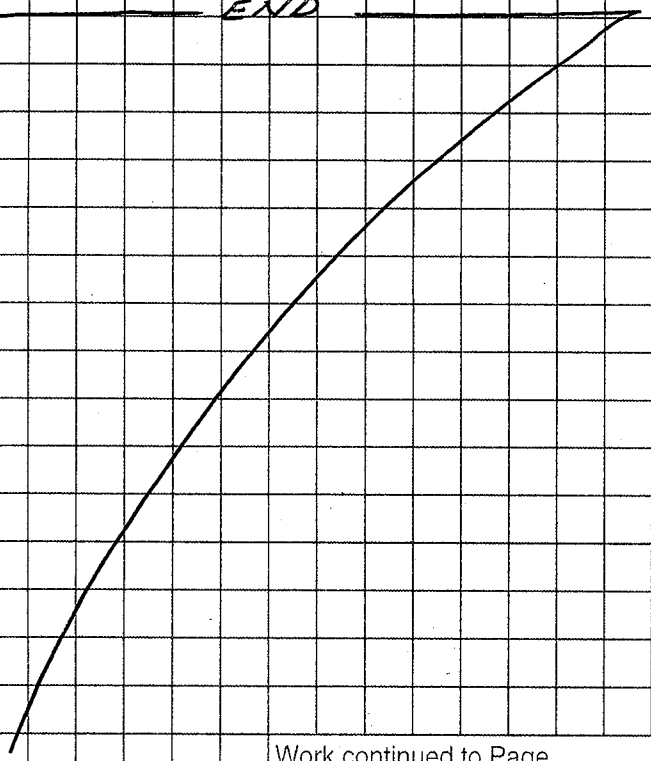
THURS 3-11-10

Work continued from Page

SAMPLE SUMMARY:

- COMPLETED 16 OF 21 SAMPLE LOCATIONS @ TEST AREA 1 (UXO21)
- COMPLETED SOIL SAMPLING @ TORPEDO CASING STORAGE AREA (UXO23).
- SHIPPED SAMPLES THIS DATE ON COCs 27385 → 27389 to ANALYTICAL LABORATORY SERVICES INC VIA FEDEX AB# 863125265430.

END



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Work continued to Page

SIGNATURE Terry Boyd

WITNESS

DATE 3-11-10

DATE

12

TITLE

PROJECT NO.

BOOK NO.

3-12-10 Rainy, 50°F

Work continued from Page

0700: Arrived at Trailer UXO Tech (Bruce Carhal) went over Daily Safety Briefing. Covered HASP with replacement Vironex driller.

0745: Put on Rain Gear and mobilized to Area 8 (UXO-02) to begin DPT sampling. 1st area (7 samples) will be collected via DPT. Area near Eagles Nest will be collected by Hand Auger. Low lying area TBD. Collected Subsurface samples * from SB-9, 10, 5, 6, 2, 3 (SB-3 location had to be adjusted, because the slope is too steep.)

1000: DPT rig got stuck in mud on the way down to collect last sample (SB-001) on the ridge. After attempting to use logs & ramps w/o success, called an on-base backhoe.

1100: Backhoe pulled rig out and set up at SB-001.

1145: Borings on Ridge at Area 8 completed via DPT.

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Work continued to Page

SIGNATURE Ellen Berkelite

WITNESS

DATE 3-12-10

DATE

13

TITLE

PROJECT NO.

BOOK NO.

3-12-10 50°F Rainy (Very)

Work continued from Page

1230: Scoped out Borings to be completed via DPT at North End of Site (Area 8) Away from Eagle's Nest Area. Talked to Fred Ramser about placement of 3 temporary wells that will be completed tomorrow. Agreed upon these well locations:

① Across road ~~South~~ West of pond at SW corner of MRP boundary @ SB-32.

② Across road due west of pond at approx. SB-29.

③ North of these 2 wells (halfway) towards MW-1 @ SB-12.

Eliminated some well locations due to swampy saturated conditions.

Completed drilling DPT drilling for: SB-7, 8, 12, 27, 15, 18, 26.

Left trailer @ 1700.

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Work continued to Page

SIGNATURE Ellen Borkhie

WITNESS

DATE 3-12-10

DATE

TITLE NSF INDIAN HEAD

PROJECT NO. 112G00810

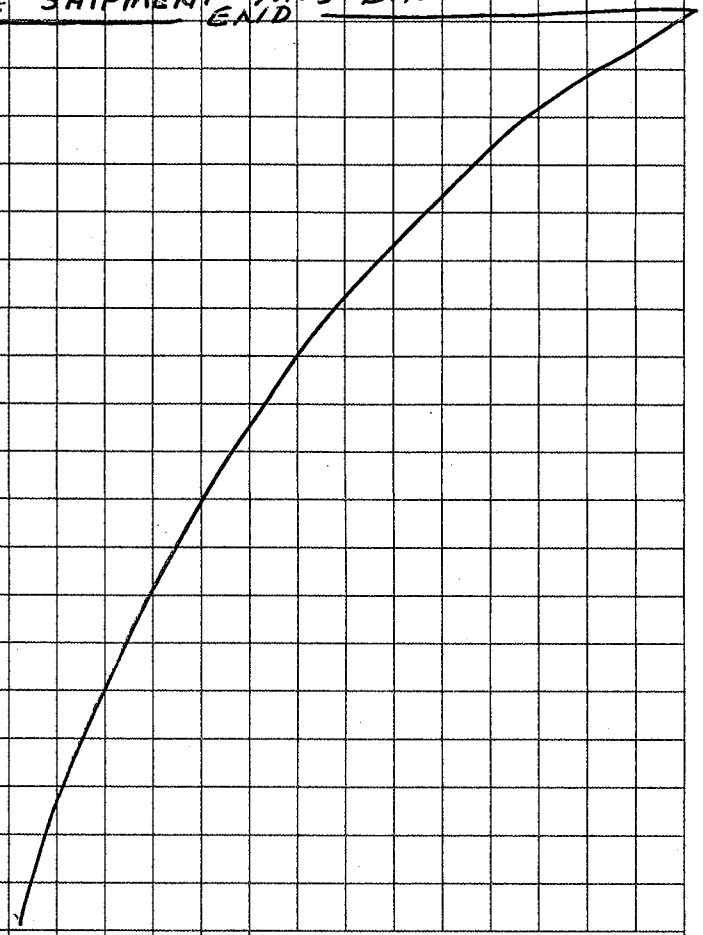
BOOK NO. 2670

FRI 3-12-10

Work continued from Page

SAMPLE SUMMARY:

- COMPLETED 14 OF 20 SAMPLE BORINGS @ UXO-02
- COMPLETED SURFACE SOIL SAMPLING @ UXO-21
- DEVELOPED & CONDUCTED WELL INSPECTIONS @ 2 6MW 01, 02 & 03
- NO SAMPLE SHIPMENT ~~END~~ THIS DATE



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Work continued to Page

SIGNATURE Terry Ryder

WITNESS

DATE 3/12/10

DATE

TITLE

PROJECT NO.

BOOK NO.

3-13-10: 50°F, Rainy – Test Area 8 (UXO 02)

Work continued from Page

~0700: Met at gate and waited to be let in.

0730: UXO Safety Briefing (Bruce Carnal) mentioned that he saw a tick on his windshield.

0800: Mobilized to SB-32 and moved the location ~ 50 feet NW to be out of the "Eagle West Zone" – UXO tech (Frank Montes) used a compass & then Schonstedt to clear the location. Collected 2 subsurface samples with DPT at SB-32 and then pulled out & attached hollow stem augers to install a 2" temporary well. Drillers only brought 2" well materials. Discussed temporary well specs, as outlined in the SOP, with the drillers. When GW is encountered, they will drill another 8-9' and set a 10' well screen & then casing that sticks up ~ 2-3 above surface. GW encountered ~ 10' and is trickling in rising up to ~ 9.5'. Discussed setting an 18' deep well with 10' screen & 10' riser.

(4.25" I.D.)

Moist, Sandy Clay 0-5' (tan)

Moist, Clayey Sand 6'-9.5' (tan) GW at 9.5-18'

Saturated, Sandy Clay (tan) 10'-18'

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Work continued to Page

SIGNATURE

DATE

WITNESS

DATE

GMan, Borelite 3-13-10

TITLE 3-13-10:

PROJECT NO.

BOOK NO. (0630-1045)

50°F, Rainy XO2TW-01 (SB-32)

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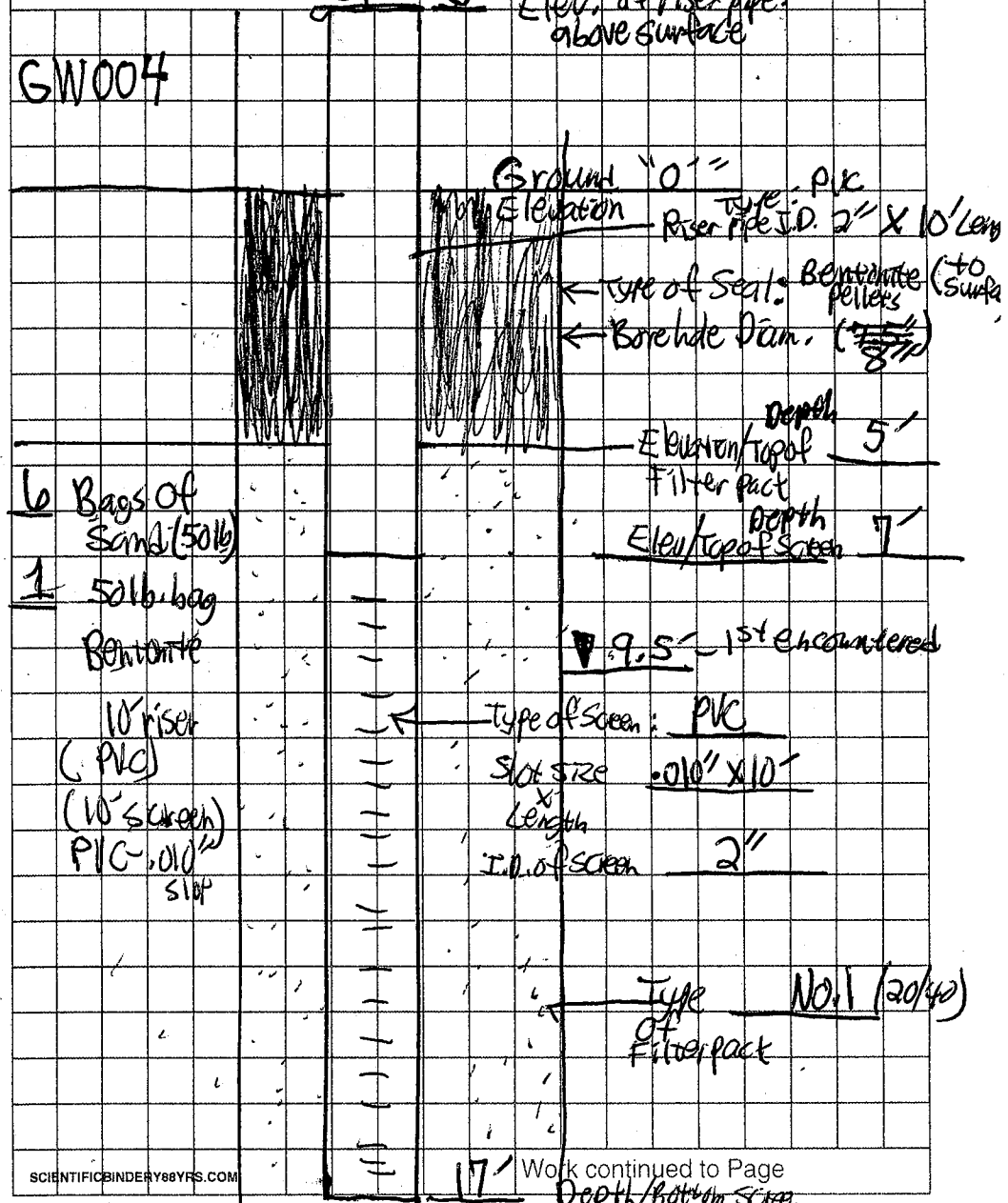

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Work continued to Page

SIGNATURE

DATE

WITNESS

DATE

* collected subsurface samples: 2-4' and 4-6'

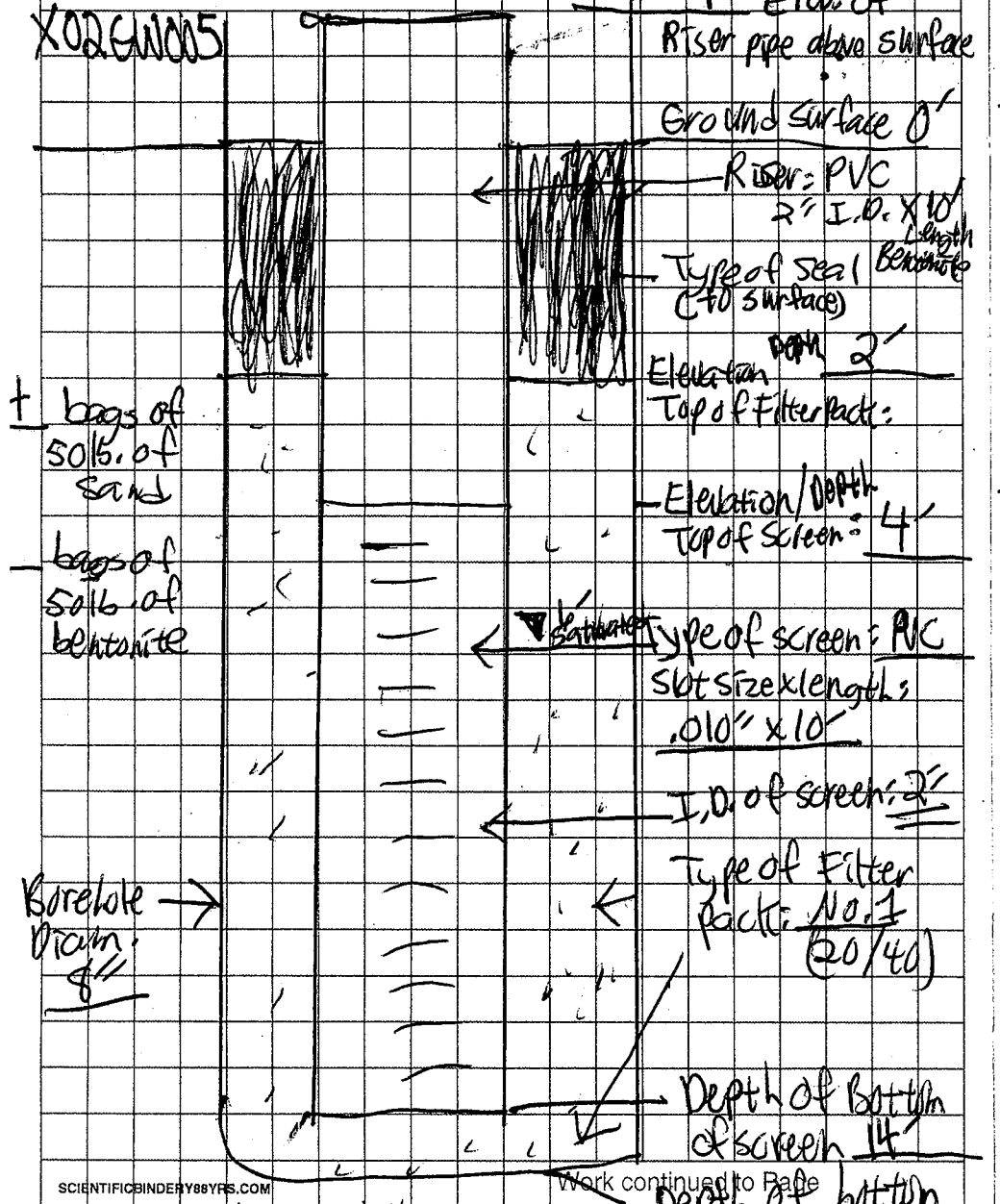
GMan, Borelite 3-13-10

TITLE 01100-1300 PROJECT NO. 50° F/Rainy

BOOK NO.

3-13-10: X02 TW02 (SB-29) - Moved

Work continued from Page



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0-5' Tan, Moist Sandy clay
5'-15' Tan, Moist Clayey sand
Saturated at 6'

SIGNATURE DATE

18

3/B

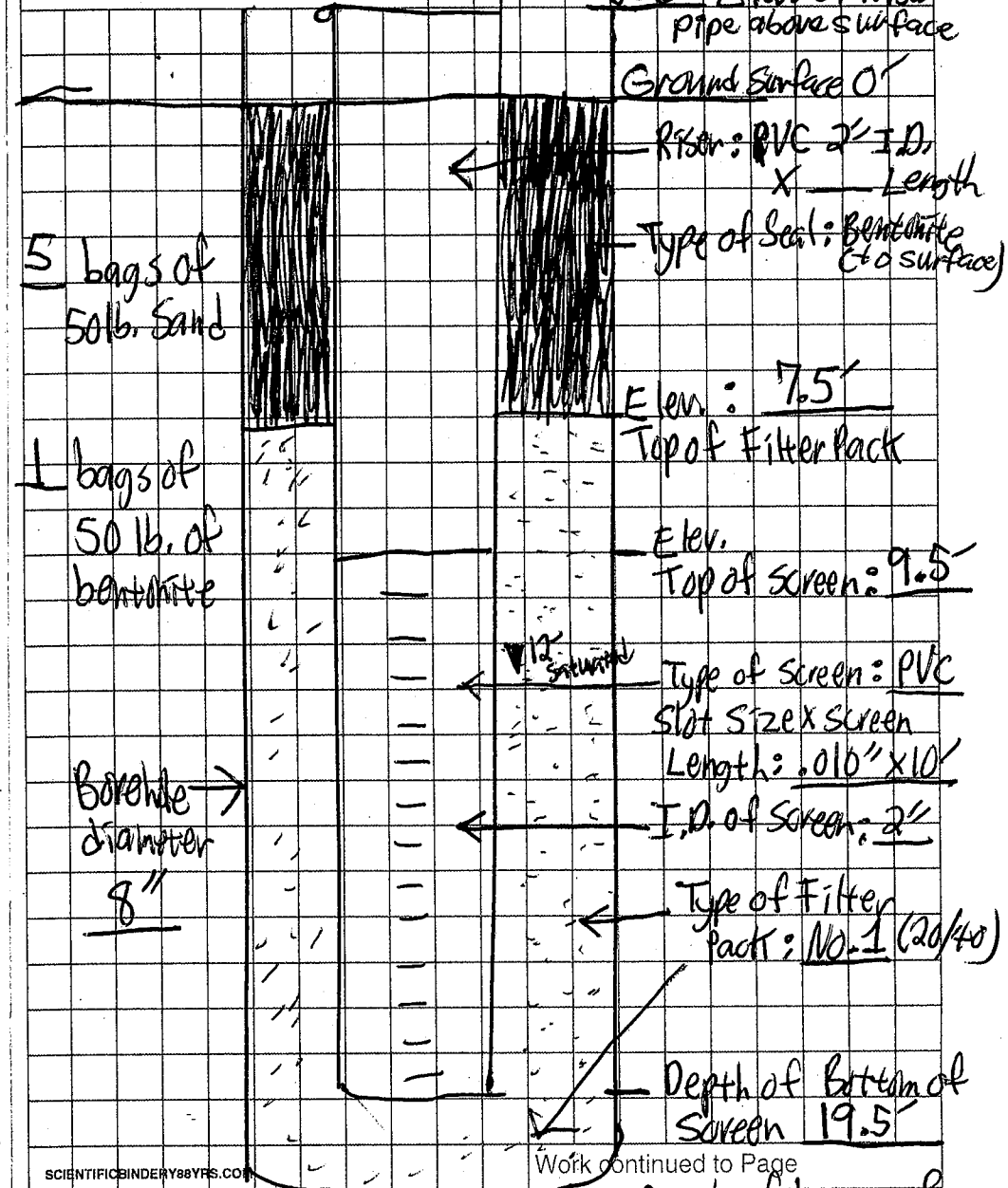
* Mixed Yo Full 55 gal drum Cuttings TW02 → TW03

TITLE 1330-1530 PROJECT NO. 50° Rainy

BOOK NO.

3-13-10: X02 TW03 (SB-12)

Work continued from Page



Work continued to Page

0-8' Tan, Moist Sandy clay
8-10' D. Brown, Moist, Sandy Clay
10'-20' Tan, Moist Clayey Sand

SIGNATURE DATE

Ellen Bonifacio DATE

19

* Filled up rest of drum

TITLE

PROJECT NO.

BOOK NO.

3-13-10: ~~X025~~

Work continued from Page

Virotex left site @ 1615.
Went back to trailer to put all soil samples from 3-12 and 3-13-10 in individual baggies. Told drillers (Virotex) to meet at site @ 0800 - (time change Spring forward - Daylight Savings Time tonight.

Logged in Test Area 1 Samples
Left trailer @ 1830.

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Work continued to Page

SIGNATURE Ellen Berkelite

WITNESS

DATE 3/13/10

DATE

TITLE NSF INDIAN HEAD

PROJECT NO. 112G00810

BOOK NO. 2670

SAT. 3-13-10

Work continued from Page

SAMPLE SUMMARY:

- INSTALL TEMP WELLS @ AREA 8
- DEVELOPE EXISTING WELLS @ AREA 8 25MW01, 02 & 03 & COMPLETE WELL INSPECTIONS
- SAMPLE EXISTING WELL 26MW03 @ BASIC IED
- GPS Soil Boring locations @ AREA 8

END

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Work continued to Page

SIGNATURE Terry Ryan

WITNESS

DATE 3-13-10

DATE

TITLE Sunday

PROJECT NO.

BOOK NO.

3-14-10: 50°F, Very Rainy

Work continued from Page

Arrived at gate with ice @ 0900 and waited to be let in by security @ 0820.
0830: UXO Safety Briefing (Bruce Carnal)
0900: Mobilized to Advanced IED to clear locations with UXO tech (Frank Montes).
0930: Beginning with 3 borings in restricted area: SB-22, 23, 16.

OPT Drilled SB-22, 16, 12, 23. After drilling SB-23, rig was stuck for approx. 1½ hours. UXO techs Vironex used logs, concrete blocks, etc. to build ramp and moved to:
12:45: SB-3 & SB-4 (last borings on this side of wetlands.)
1345: Moved to other side of wetlands to begin OPT borings on that side: completed SB-17, 13, 14, 18, 19, 15, 9.

1845: Left Trailer:

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Work continued to Page

SIGNATURE Ellen Berkette

WITNESS

DATE 3-14-10

DATE

22

TITLE NSF INDIAN HEAD

PROJECT NO. 112G00810

BOOK NO. 2670

SUN 3-14-10

Work continued from Page

SAMPLE SUMMARY:

- COMPLETE 13 of 25 locations (2 → 6') @ ADVANCED IED
- COMPLETE GW SAMPLING @ BASIC IED
- COMPLETE 1 OF 3 GW WELLS @ AREA 8
- GPS ALL SAMPLE LOCATIONS @ TEST AREA 1, TORPEDO CASING & BURIAL SITES

END

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Work continued to Page

SIGNATURE Terry Rogers

WITNESS

DATE 3-14-10

DATE

23

TITLE Monday PROJECT NO.

3-15-10: 50°F, Rainy, Windy BOOK NO.

Work continued from Page

0730: Met at Trailer for UXO Safety Briefing.
0800: Loaded up to go to Advanced IED - should complete today.
0830: Arrived at Advanced IED for subsurface sampling via DPT and HA (low lying swampy areas and two in bird area - SB-24+25).

1460: Completed Advanced IED area. Mobilized to complete 5 HA subsurface samples in Eagles Nest Area, at Area 8 (UXO 02).

1620: Completed Area 8 (UXO 02), went back to trailer to pack up all soil + gw samples collected from Friday → Monday for shipment via FEDEX.

1915: Left Trailer.

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Work continued to Page

SIGNATURE 3-15-10 DATE

WITNESS DATE

TITLE NSF INDIAN HEAD PROJECT NO. 112600810

BOOK NO. 2670

Mon 3-15-10

Work continued from Page

SAMPLE SUMMARY:

- COMPLETED
  - SOIL SAMPLING @ UXO 02 - STUDY AREA 8 & ADVANCED IED - UXO 05
  - SAMPLED 1 OF 3 TEMP WELL @ UXO 02
  - COMPLETED SAMPLING OF EXISTING WELLS @ UXO 02
  - SHIPPED SAMPLES THIS DATE ON COCs 27390-27392, 27404 & 27400 FOR UXO 02; 27397 FOR UXO 04, 27393-27395, 27401 & 27403 FOR UXO 05, AND 27396 FOR UXO 21 to ANALYTICAL LAB SER. INC VIA FED EX AB # 8712 9629 9523

END

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Work continued to Page

SIGNATURE DATE

WITNESS DATE

TITLE Tuesday PROJECT NO.

BOOK NO.

3-16-10: Party Sunny 58°F

Work continued from Page

0730: Met at trailer for UXO Safety Briefing.
0800: Mobilized to Air Blast Pond for DPT subsurface drilling.
1020: Completed subsurface drilling at Air Blast Pond. - 6 locations.
1040: Mobilized to Basic IED Area to begin DPT drilling for subsurface samples.
1720: Completed 11 of 20 DPT borings.
1840: Left Trailer.

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Work continued to Page

SIGNATURE Ellen Berkette

WITNESS

DATE 3-16-10

DATE

TITLE Wednesday PROJECT NO.

BOOK NO.

3-17-10: Sunny 50°F

Work continued from Page

0730: Met at trailer for UXO safety briefing.
0800: Mobilized to ~~Air~~ Basic IED for completion of subsurface drilling.
1330: Completed subsurface drilling with DPT (6 locations) and 3 locations inaccessible by the rig (HA), at Basic IED Area. (All PID readings 0 ppm
1400: Moved drums with help of front end loader from Temporary well locations to IDW at Rum Point Road. (Drums #5 + #6) Moved Drums #1, 2, 3, 4 (on secondary containment behind trailer) via Forklift to Rum Point Drive. This equipment was organized thru the Navy contact utilizing an onsite Subcontractor.
1500: Vironex completed tremie grouting and abandonment of 3 temporary wells installed at Area 8, left site.
1700: Left Trailer.

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Work continued to Page

SIGNATURE Ellen Berkette

WITNESS

DATE 3-17-10

DATE

TITLE

PROJECT NO.

BOOK NO.

3-18-10 : Sunny 60°F

Work continued from Page

0830: Arrived at trailer for UXO safety briefing.

* Called @ Trailer Rental company - William Scotsman They claimed to have sent someone out this morning, but were told to come back in a week. No Tetra Tech employee talked to them. Arranged for 3/22/10 pickup.

(2) Called Kelly Generator for 3/22/10 pickup

(3) Called Roy Morris @ United Services for 3/22/10 Port-o-John pickup.

* All rental subcontractors said no one needed to be present. Remained at trailer to complete logging and processing of all composite samples from Test Area 8 and Air Blast Pond. Packaged all samples collected Wed & Thur. for FedEx.

1800: Left trailer, and headed to FEDEX.

2000: Handed trailer key to UXO Tech - Frank Montes.

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Work continued to Page

SIGNATURE Ellen Berkhite

DATE 3-18-10

WITNESS

DATE

TITLE

PROJECT NO.

BOOK NO.

Work continued from Page

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Work continued to Page

SIGNATURE

DATE

WITNESS

DATE

APPENDIX G

MC SI SITE PHOTOS
(ON CD)

AIR BLAST POND (UXO-01) PHOTOGRAPHS (SOURCE: APPENDIX B – UFP SAP)

1. **Vegetation Surrounding the Air Blast Pond**

2. **Overgrown Berm at the Air Blast Pond**

3. Current View of Berm, Stairs, and Concrete Tank

AREA 8 (UXO-02) PHOTOGRAPHS (SOURCE: APPENDIX B – UFP SAP)

1. **View of Pond at Area 8 and the Surrounding Vegetation**

2. **View of Woods Surrounding Area 8 East of Roach Road**

3. **View of Chicamuxen Creek Immediately West of Area 8 and Roach Road**

4. **View of Pond and Building 60SN at Area 8**

5. View of Trail Walked in Woods East of Roach Road

6. View of Building 2210SN Looking East from Roach Road

7. View of Parking Lot Looking East from Roach Road

EOD SCHOOL DEMOLITION AREA (UXO-28) PHOTOGRAPHS (SOURCE: APPENDIX B – UFP SAP)

1. **Current Site Conditions of the EOD School Demolition Area**

BASIC IED AREA (UXO-04) PHOTOGRAPHS (SOURCE: APPENDIX B – UFP SAP)

1. **Access Road and Vegetation Across the Basic IED Area**

2. **Looking South at Building 2087 Located in the Northern Portion of Basic IED Area**

ADVANCED IED AREA (UXO-05) PHOTOGRAPHS (SOURCE: APPENDIX B – UFP SAP)

1. **View of Northern Side of Advanced IED Area**

2. **View of Southern Side of Advanced IED Area**

STUMP NECK IMPACT AREA (UXO-10) PHOTOGRAPHS (SOURCE: APPENDIX B – UFP SAP)

1. **Vegetation at the Stump Neck Impact Area (Looking West from Roach Road)**

2. **Wetlands at the Stump Neck Impact**

3. Heavy Shrubs Observed from the Periphery of the Impact Area

TEST AREA 1 (UXO-21) PHOTOGRAPHS (SOURCE: APPENDIX B – UFP SAP)

1. **Antenna Dish Partially Overgrown by Vegetation**

2. **Test Area 1 is Currently a Wooden, Overgrown Area**

3. Current Structures at Test Area 1 Used in the Robotics Testing

TORPEDO BURIAL SITE (UXO-12) PHOTOGRAPHS (SOURCE: APPENDIX B – UFP SAP)

1. **Vegetation on the Torpedo Burial Site (Looking East Down the Utility Row)**

2. **Small Tributary that Bisects the Torpedo Burial Site (Looking South Towards the Wetlands)**

3. WWII Era Torpedoes Resembling those Allegedly Buried at The Torpedo Burial Site

TORPEDO CASING DISPOSAL SITE (UXO-23) PHOTOGRAPHS (SOURCE: APPENDIX B – UFP SAP)

1. **The Torpedo Casing Disposal Area and Wildlife Protection Area**

APPENDIX H

LABORATORY APPENDIX TABLES
(ON CD)

ANALYTICAL LABORATORY SERVICES, INC.
www.analyticallab.com
NELAP Accredited
PA 22-293 NJ PA010
ACCREDITED IN ACCORDANCE WITH nelac
34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

Project Name:	**NSF INDIAN HEAD-MD SITE**	Workorder:	**9837632**
Purchase Order:	**112G00810**	Workorder ID:	**CT0 423 TCLP Metals**

Ms. Tobrena Skeen
Tetra Tech NUS, Inc
661 Andersen Drive
Foster Plaza 7
Pittsburgh, PA 15220

April 8, 2010

Dear Ms. Skeen,

Enclosed are the analytical results for samples received by the laboratory on Saturday, March 27, 2010

ALSI is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Susan Baer (Project Coordinator) or Anna G Milliken (Laboratory Manager) at (717) 944-5541.

Please visit us at www.analyticallab.com for a listing of ALSI's NELAP accreditations and Scope of Work, as well as other links to Water Quality documentation on the internet.

This laboratory report may not be reproduced, except in full, without the written approval of ALSI.

NOTE: ALSI has changed the report generation tool and while we have tried to retain the existing format, you will notice some changes in the laboratory report. Please feel free to contact ALSI in case you have any questions.

Analytical Laboratory Services, Inc.

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Anna G Milliken
Laboratory Manager

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SAMPLE SUMMARY

Workorder: 9837632 CT0 423 TCLP Metals Discard Date: 06/07/2010

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
9837632001	IDW032610-01	Water	3/26/10 13:30	3/27/10 10:30	Customer
9837632002	IDW032610-02	Solid	3/26/10 13:40	3/27/10 10:30	Customer

Workorder Comments:

Notes

-- Samples collected by ALSI personnel are done so in accordance with the procedures set forth in the ALSI Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.

Standard Acronyms/Flags

J, B	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference

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ANALYTICAL RESULTS

Workorder: 9837632 CT0 423 TCLP Metals

Lab ID: **9837632001** Date Collected: 3/26/2010 13:30 Matrix: Water

Sample ID: **IDW032610-01** Date Received: 3/27/2010 10:30

Parameters	Results	Units	Footnotes	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
TCLP METALS											
Arsenic, Total	ND	mg/L		0.0090	0.0030	SW846 6010C	4/7/10	MNP	4/7/10 11:24	TED	B2
Barium, Total	0.10	mg/L		0.011	0.0036	SW846 6010C	4/7/10	MNP	4/7/10 11:24	TED	B2
Cadmium, Total	ND	mg/L		0.0022	0.00073	SW846 6010C	4/7/10	MNP	4/7/10 11:24	TED	B2
Chromium, Total	0.011	mg/L		0.0060	0.0020	SW846 6010C	4/7/10	MNP	4/7/10 11:24	TED	B2
Lead, Total	0.0051J	mg/L		0.0067	0.0022	SW846 6010C	4/7/10	MNP	4/7/10 11:24	TED	B2
Mercury, Total	ND	mg/L		0.0020	0.000030	SW846 7470A	4/5/10	BLB	4/5/10 14:46	BLB	B1
Selenium, Total	ND	mg/L		0.022	0.0073	SW846 6010C	4/7/10	MNP	4/7/10 11:24	TED	B2
Silver, Total	ND	mg/L		0.0044	0.0014	SW846 6010C	4/7/10	MNP	4/7/10 11:24	TED	B2
TCLP LEACHATE											
Final pH	6.00	pH_Units				SW846 1311			4/5/10 07:00	SDL	A

Sample Comments:

The percent dry solid per the EPA leaching procedure was less than 0.5%. The sample was filtered to form the leachate.

Anna G Milliken
Laboratory Manager

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ANALYTICAL RESULTS

Workorder: 9837632 CT0 423 TCLP Metals

Lab ID: **9837632002** Date Collected: 3/26/2010 13:40 Matrix: Solid

Sample ID: **IDW032610-02** Date Received: 3/27/2010 10:30

Parameters	Results	Units	Footnotes	RDL	MDL	Method	Prepared	By	Analyzed	By	Cntr
TCLP METALS											
Arsenic, Total	0.020	mg/L		0.0090	0.0030	SW846 6010C	4/1/10	MNP	4/5/10 03:09	SRT	B1
Barium, Total	0.21	mg/L		0.011	0.0036	SW846 6010C	4/1/10	MNP	4/5/10 03:09	SRT	B1
Cadmium, Total	ND	mg/L		0.0022	0.00073	SW846 6010C	4/1/10	MNP	4/5/10 03:09	SRT	B1
Chromium, Total	0.0036J	mg/L		0.0060	0.0020	SW846 6010C	4/1/10	MNP	4/5/10 03:09	SRT	B1
Lead, Total	0.0067J	mg/L		0.0067	0.0022	SW846 6010C	4/1/10	MNP	4/5/10 03:09	SRT	B1
Mercury, Total	ND	mg/L		0.0020	0.000030	SW846 7470A	4/2/10	BLB	4/2/10 14:59	BLB	B2
Selenium, Total	0.015J	mg/L		0.022	0.0073	SW846 6010C	4/1/10	MNP	4/5/10 03:09	SRT	B1
Silver, Total	ND	mg/L		0.0044	0.0014	SW846 6010C	4/1/10	MNP	4/5/10 03:09	SRT	B1
TCLP LEACHATE											
Extraction Fluid Used	1					SW846 1311			3/31/10 11:40	SDL	A
Final pH	4.91	pH_Units				SW846 1311			3/31/10 11:40	SDL	A
Preliminary pH after DI water	4.52	pH_Units				SW846 1311			3/31/10 11:40	SDL	A

Sample Comments:

Anna G Milliken
Laboratory Manager

Report ID: 9837632

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CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1

Courier: Fed EX

Tracking #: 8659 9070 97

9837632

Co. Name: Tetra Tech MUS, INC.

Contact (Report to): R. Basinski Phone: (412) 921-8308

Address: 661 Andersen Drive Pittsburgh, PA 15220

Bill to (if different than Report to): PO#:

CTO: 423

Project Name/#: 112G00810 ALSI Quote #:

TAT: [X] Normal-Standard TAT is 10-12 business days. Date Required:

[ ] Rush-Subject to ALSI approval and surcharges. Approved By:

Email? [ ] -Y

Fax? [ ] -Y No.:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	TCLP Metals	TCLP Metals
1 IDW032610-01	1 L Amber of Liquid	3-26-10	1330	C	OL	1	0
2 IDW032610-02	8oz Jar of Soil	3-26-10	1340	C	SO	0	1
3							
4							
5							
6							
7							
8							

***Container Type: Glass (AG) / Glass (CG)

***Container Size: 1 Liter / 8oz

***Preservative: — / —

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis

SAMPLED BY (Please Print): Stuart Cameron

LOGGED BY(signature): DATE: 3/31/10 TIME: 0934

REVIEWED BY(signature): DATE: 03/31/10 TIME: 1429

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Stuart Cameron / TtNUS	3-26-10	1500	2	3/27	1050
3			4		
5			6		
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] other

EDDs Required? [ ] If yes, format type:

SDWA Forms? yes [ ]

State Samples Collected In? MD [X] NJ [ ] NY [ ] PA [ ] Other

Enter PWSID No.

DOD Criteria Required?

Receipt Information (completed by Sample Receiving)

Performed by: [illegible]

Cooler Temp: 4

Therm. ID: 10332746

No. of Coolers:

Notes:

Circle appropriate Y or N.	Container in good condition?	COC/Labels complete/accurate?	Received on ice?	Correct preservation?	Correct sample volume?	Headspace/Volatiles?	Custody seals Present? / (if present) Seals intact?	Correct containers?
	N	N	N	N	N	Y	Y / Y	N

ALSI FIELD SERVICES

[ ] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite

**Matrix: Al=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 6/07

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TABLE A-12

STATISTICAL SUMMARY OF ANALYTICAL RESULTS FOR FRESHWATER SEDIMENT SAMPLES
BACKGROUND INVESTIGATION REPORT
INDIAN HEAD DIVISION
NSWC INDIAN HEAD, MARYLAND

Chemical	Frequency of Detection	Minimum Detection	Maximum Detection	Average of Positive Detections	Location of Maximum	Distribution of Data	95% Upper Confidence Limit	95% Upper Tolerance Limit	Eastern U.S. Soils[1]	Maryland Soils[2]	Residential Risk-Based Concentration[3]	Industrial Risk-Based Concentration[3]
Pesticides/PCBs (ug/kg)												
4,4'-DDD	4/10	1.0	40	17.1	BGDSD0090101	Lognormal	29.9	118	NA	NA	2700	24000
4,4'-DDE	5/10	1.8	12	4.84	BGDSD0090101	Lognormal	6.85	26.1	NA	NA	1900	17000
4,4'-DDT	3/10	1.9	14	6.57	BGDSD0090101	Undefined	14	14	NA	NA	1900	17000
Inorganics (mg/kg)												
Aluminum	10/10	639	16600	4393	BGDSD0070101-D	Lognormal	13234	52362	7000 - 100000	NA	78000	2000000
Arsenic	9/10	0.25	10.6	3.3	BGDSD0070101	Lognormal	10.6	63	<0.1 - 73	1.1 - 7.1	0.43	3.8
Barium	10/10	5.8	175	42.0	BGDSD0070101, BGDSD0070101-D	Lognormal	145	577	10 - 1500	150 - 700	5500	140000
Beryllium	7/10	0.13	1.0	0.52	BGDSD0100101	Lognormal	1.0	10.9	<1 - 7	ND - 3	160	4100
Cadmium	7/10	0.13	0.86	0.35	BGDSD0090101	Lognormal	0.57	1.85	NA	<0.01 - 6.6	78	2000
Calcium	6/10	110	10100	2917	BGDSD0090101	Lognormal	10100	88137	100 - 280000	NA	NA	NA
Chromium	10/10	3.3	29.7	11.6	BGDSD0070101-D	Lognormal	22.9	79.2	1 - 1000	15 - 100	230	6100
Cobalt	10/10	0.67	17.6	5.97	BGDSD0070101	Lognormal	17.6	118	<0.3 - 70	ND - 20	1600	41000
Copper	10/10	0.62	28.3	9.5	BGDSD0070101-D	Lognormal	28.3	297	<1 - 700	5 - 70	3100	82000
Iron	10/10	1780	**42900**	13202	BGDSD0070101	Lognormal	42900	193218	100 - >100000	NA	23000	610000
Lead	10/10	1.8	79.3	23.1	BGDSD0050101	Lognormal	79.3	476	<10 - 300	10 - 50	400[4]	750[4]
Magnesium	10/10	96.7	**3030**	914	BGDSD0090101	Lognormal	3030	19043	50 - 50000	NA	NA	NA
Manganese	10/10	11.2	444	162	BGDSD0090101	Lognormal	444	2561	<2 - 7000	NA	1600	41000
Mercury	10/10	0.01	0.25	0.07	BGDSD0070101	Lognormal	0.196	0.778	0.01 - 3.4	0.04 - 0.14	23	610
Nickel	8/10	0.54	25.2	9.2	BGDSD0010101	Lognormal	25.2	382	<5 - 700	ND - 30	1600	41000
Potassium	10/10	95.2	2050	567	BGDSD0020101	Lognormal	1328	5061	50 - 37000	NA	NA	NA
Selenium	7/10	0.45	2.3	0.93	BGDSD0070101	Lognormal	1.73	6.45	<0.1 - 3.9	<0.1 - 0.5	390	10000
Silver	2/10	0.31	0.92	0.62	BGDSD0090101	Undefined	0.92	0.92	NA	NA	390	10000
Sodium	8/10	30.2	303	85.7	BGDSD0090101	Lognormal	144	472	<500 - 50000	NA	NA	NA
Vanadium	10/10	3.2	46.3	18.6	BGDSD0100101	Lognormal	46.3	196	<7 - 300	20 - 150	550	14000
Zinc	9/10	4.4	158	41.2	BGDSD0070101-D	Lognormal	158	1660	<5 - 2900	6 - 113	23000	610000
Miscellaneous (mg/kg)												
Total organic carbon	10/10	444	43500	10052	BGDSD0070101-D	Lognormal	43500	395297	NA	NA	NA	NA

Notes:
1 - Shacklette and Boerngen, (1984).
2 - Dragun (1991). Values presented in table are surface soil values.
3 - EPA Region III Risk-Based Concentrations, October, 2002.
4 - EPA Region 9 PRGs Table, October, 2002.
Bolded values are exceedances of Region III RBCs.
NA - Not available

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0010204	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0010204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	BARIUM	71.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	BERYLLIUM	0.89	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0010204	CALCIUM	194	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	CHROMIUM	27	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	COBALT	4.3	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0010204	COPPER	12.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	LEAD	9.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	LITHIUM	15.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	MERCURY	0.0069	MG/KG	UL	DH	MATRIX SPIKE RECOVERY AND HOLD TIME NONCOMPLIANCE
X05SB0010204	NICKEL	13	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0010204	POTASSIUM	2590	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0010204	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	SILVER	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	SODIUM	93.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	STRONTIUM	10.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	TIN	1.6	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	VANADIUM	36.9	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010204	ZINC	37.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0010406	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010406	ARSENIC	1.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010406	BERYLLIUM	0.56	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0010406	COBALT	2.3	MG/KG	L	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0010406	MANGANESE	30.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010406	NICKEL	5.8	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0010406	POTASSIUM	784	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0010406	SODIUM	25.9	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0010006	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006	ARSENIC	4.1	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006	BARIUM	53.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006	BERYLLIUM	0.68	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0010006	CALCIUM	269	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006	CHROMIUM	20.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006	MERCURY	0.01	MG/KG	J	DHP	MATRIX SPIKE RECOVERY, HOLD TIME NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0010006	SELENIUM	0.22	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006	SODIUM	29.4	MG/KG	K	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0010006	STRONTIUM	5.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0010006	VANADIUM	33.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	ARSENIC	3.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	BARIUM	64.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	BERYLLIUM	0.74	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0010006-D	CADMIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	CALCIUM	282	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	CHROMIUM	24.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	COBALT	19.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	COPPER	12.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	LEAD	27.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	LITHIUM	20.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	MERCURY	0.049	MG/KG	J	H	HOLD TIME NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0010006-D	NICKEL	15.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	SELENIUM	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	SILVER	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	SODIUM	47.9	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0010006-D	STRONTIUM	7.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	VANADIUM	37.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010006-D	ZINC	47.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010024	ANTIMONY	0.064	MG/KG	UJ	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010024	ARSENIC	1.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010024	BARIUM	73.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010024	BERYLLIUM	0.95	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0010024	CALCIUM	269	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010024	CHROMIUM	26.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0010024	MERCURY	0.019	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0010024	SELENIUM	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010024	SODIUM	59.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010024	STRONTIUM	8.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0010024	VANADIUM	42.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0020204	TETRYL	0.2	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0020204	ANTIMONY	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	BARIUM	84.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	BERYLLIUM	0.79	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0020204	CALCIUM	261	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	CHROMIUM	26.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	COBALT	13.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0020204	COPPER	12.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	LEAD	13.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	LITHIUM	23	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	MERCURY	0.028	MG/KG	J	DHK	MATRIX SPIKE RECOVERY, ICP INTERFERENCE, AND HOLD TIME NONCOMPLIANCE
X05SB0020204	NICKEL	16.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	POTASSIUM	2260	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	SILVER	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	SODIUM	64.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	STRONTIUM	9.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	TIN	1.6	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	VANADIUM	40.9	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020204	ZINC	50.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0020204	TOTAL ORGANIC CARBON	2060	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0020406	TETRYL	0.2	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0020406	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	BARIUM	95.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	BERYLLIUM	1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	CALCIUM	131	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	CHROMIUM	28.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	COBALT	11.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	COPPER	14	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	LEAD	18.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	LITHIUM	33	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	MERCURY	0.015	MG/KG	J	DHKP	MATRIX SPIKE RECOVERY, HOLD TIME, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0020406	NICKEL	20	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0020406	POTASSIUM	3020	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	SILVER	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	SODIUM	108	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	STRONTIUM	10.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	VANADIUM	43.3	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	ZINC	58	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0020406	TOTAL ORGANIC CARBON	1450	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020006	ALUMINUM	16600	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0020006	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020006	BARIUM	74.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020006	CALCIUM	343	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020006	CHROMIUM	24.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0020006	MERCURY	0.065	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0020006	SODIUM	41.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020006	STRONTIUM	8.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020006	VANADIUM	40.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020024	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020024	ARSENIC	3.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020024	BARIUM	77.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020024	BERYLLIUM	0.72	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0020024	CADMIUM	0.21	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0020024	CALCIUM	431	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020024	CHROMIUM	25	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020024	MERCURY	0.064	MG/KG	J	DHK	MATRIX SPIKE RECOVERY, ICP INTERFERENCE, AND HOLD TIME NONCOMPLIANCE
X05SS0020024	SELENIUM	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0020024	SODIUM	46.7	MG/KG	K	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0020024	STRONTIUM	9.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0020024	VANADIUM	43.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0030204	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	ARSENIC	5.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	BARIUM	80.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	BERYLLIUM	0.86	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0030204	CALCIUM	280	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	COBALT	7.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	COPPER	10.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	LEAD	11.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	LITHIUM	24.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0030204	MERCURY	0.043	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0030204	NICKEL	16.7	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0030204	SELENIUM	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	SODIUM	108	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030204	ZINC	51.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0030406	ANTIMONY	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	ARSENIC	5.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	BARIUM	83.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	BERYLLIUM	0.93	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0030406	CALCIUM	290	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	COBALT	12.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	COPPER	10.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	LEAD	13.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0030406	LITHIUM	24.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	MERCURY	0.046	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0030406	NICKEL	17	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0030406	SELENIUM	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	SODIUM	108	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0030406	ZINC	52.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030006	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030006	ARSENIC	9.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030006	BARIUM	92.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030006	BERYLLIUM	0.74	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0030006	CALCIUM	840	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030006	CHROMIUM	18.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030006	MERCURY	0.084	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030006	SELENIUM	0.22	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0030006	SODIUM	66.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030006	STRONTIUM	11	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030006	VANADIUM	33.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024	ALUMINUM	10900	MG/KG	J	G	FIELD DUPLICATE PRECISION NONCOMPLIANCE
X05SS0030024	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024	ARSENIC	4.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024	BARIUM	103	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024	CADMIUM	0.43	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0030024	CALCIUM	469	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024	CHROMIUM	21.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024	MERCURY	0.035	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0030024	SELENIUM	0.11	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024	SODIUM	64.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0030024	STRONTIUM	8.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024	VANADIUM	38.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	ALUMINUM	18600	MG/KG	J	G	FIELD DUPLICATE PRECISION NONCOMPLIANCE
X05SS0030024-D	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	ARSENIC	4.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	BARIUM	105	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	BERYLLIUM	1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	CADMIUM	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	CALCIUM	412	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	CHROMIUM	23.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	COBALT	22	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	COPPER	9.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	LEAD	16.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	LITHIUM	18.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0030024-D	MERCURY	0.046	MG/KG	J	H	HOLD TIME NONCOMPLIANCE
X05SS0030024-D	NICKEL	18.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	SELENIUM	0.051	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0030024-D	SILVER	1.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	SODIUM	70.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	STRONTIUM	9.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	VANADIUM	39.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0030024-D	ZINC	54	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0040204	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	ARSENIC	2.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	BARIUM	75.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	CALCIUM	256	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	COBALT	13.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0040204	COPPER	8.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	LEAD	10.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	LITHIUM	13.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	MERCURY	0.025	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0040204	NICKEL	12	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	SELENIUM	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	SODIUM	27.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040204	ZINC	33.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	TETRYL	0.2	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0040406	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	ARSENIC	0.71	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0040406	BARIUM	354	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	CALCIUM	1340	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0040406	COBALT	6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	COPPER	17.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	LEAD	15.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	LITHIUM	41	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	MERCURY	0.073	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0040406	NICKEL	25	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	SELENIUM	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	SILVER	0.12	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0040406	SODIUM	184	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0040406	TIN	1.5	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0040406	ZINC	78.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040006	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040006	ARSENIC	2.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0040006	BARIUM	90.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040006	CALCIUM	615	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040006	CHROMIUM	17.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040006	MERCURY	0.045	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040006	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040006	SODIUM	40.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040006	STRONTIUM	10.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040006	VANADIUM	32.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040024	ALUMINUM	20300	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0040024	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040024	BARIUM	88.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040024	CALCIUM	280	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040024	CHROMIUM	17.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0040024	MERCURY	0.031	MG/KG	K	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0040024	SODIUM	46.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040024	STRONTIUM	8.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0040024	VANADIUM	30.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	HMX	0.18	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0050204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	BARIUM	72.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	BERYLLIUM	0.67	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0050204	CALCIUM	232	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	CHROMIUM	19.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	COBALT	14.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	COPPER	7.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0050204	LEAD	13.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	LITHIUM	15	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	MERCURY	0.022	MG/KG	J	DHK	MATRIX SPIKE RECOVERY, ICP INTERFERENCE, AND HOLD TIME NONCOMPLIANCE
X05SB0050204	NICKEL	12.7	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0050204	POTASSIUM	1380	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	SILVER	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	SODIUM	39.2	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0050204	STRONTIUM	7.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	TIN	1.7	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	VANADIUM	29.7	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050204	ZINC	39.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0050406	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	BARIUM	81.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	BERYLLIUM	0.93	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0050406	CALCIUM	275	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	CHROMIUM	27.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	COBALT	12	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	COPPER	11.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	LEAD	12.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	LITHIUM	20.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	MERCURY	0.007	MG/KG	UL	DH	MATRIX SPIKE RECOVERY AND HOLD TIME NONCOMPLIANCE
X05SB0050406	NICKEL	18.8	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0050406	POTASSIUM	1820	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	SELENIUM	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0050406	SILVER	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	SODIUM	64.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	STRONTIUM	9.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	VANADIUM	45.4	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0050406	ZINC	51.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050006	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050006	ARSENIC	2.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050006	BARIUM	43.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050006	BERYLLIUM	0.42	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0050006	CALCIUM	203	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050006	CHROMIUM	13.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050006	MERCURY	0.051	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050006	SELENIUM	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050006	SODIUM	35.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0050006	STRONTIUM	5.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050006	VANADIUM	22	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050024	ANTIMONY	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050024	ARSENIC	2.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050024	BARIUM	59.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050024	CALCIUM	253	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050024	CHROMIUM	18	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050024	MERCURY	0.049	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050024	SELENIUM	0.12	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0050024	SODIUM	43.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050024	STRONTIUM	6.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0050024	VANADIUM	29.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0060204	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204	ARSENIC	3	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0060204	BERYLLIUM	0.76	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0060204	COBALT	4.7	MG/KG	L	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0060204	MANGANESE	68	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204	POTASSIUM	1390	MG/KG	J	DG	MATRIX SPIKE RECOVERY AND FIELD DUPLICATE PRECISION NONCOMPLIANCE
X05SB0060204	SODIUM	31.4	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0060204-D	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0060204-D	TETRYL	0.19	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0060204-D	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	BARIUM	59.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	BERYLLIUM	0.9	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0060204-D	CALCIUM	121	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0060204-D	CHROMIUM	27.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	COBALT	6.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	COPPER	13.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	LEAD	10.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	LITHIUM	21.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	MERCURY	0.018	MG/KG	J	DHKP	MATRIX SPIKE RECOVERY, HOLD TIME, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0060204-D	NICKEL	15.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	POTASSIUM	2720	MG/KG	J	DG	MATRIX SPIKE RECOVERY AND FIELD DUPLICATE PRECISION NONCOMPLIANCE
X05SB0060204-D	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	SILVER	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	SODIUM	66.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	STRONTIUM	8.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0060204-D	TIN	1.6	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	VANADIUM	37.2	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060204-D	ZINC	39.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0060406	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	BARIUM	40.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	BERYLLIUM	0.56	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0060406	CALCIUM	111	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	CHROMIUM	19.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	COBALT	6.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	COPPER	10.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	LEAD	9.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	LITHIUM	14.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0060406	MERCURY	0.018	MG/KG	J	DHKP	MATRIX SPIKE RECOVERY, HOLD TIME, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0060406	NICKEL	10.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	POTASSIUM	1720	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	SILVER	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	SODIUM	41.3	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0060406	STRONTIUM	6.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	TIN	1.7	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	VANADIUM	25.7	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0060406	ZINC	30.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0060006	ANTIMONY	0.067	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0060006	ARSENIC	4.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060006	BARIUM	52.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060006	BERYLLIUM	0.63	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0060006	CALCIUM	212	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060006	CHROMIUM	20.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060006	MERCURY	0.053	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0060006	SELENIUM	0.19	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0060006	SODIUM	43.4	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0060006	STRONTIUM	6.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0060006	VANADIUM	31	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060024	ANTIMONY	0.076	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0060024	ARSENIC	4.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060024	BARIUM	54.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060024	BERYLLIUM	0.73	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0060024	CADMIUM	0.22	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0060024	CALCIUM	203	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060024	CHROMIUM	22.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060024	MERCURY	0.029	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0060024	SELENIUM	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060024	SODIUM	31.3	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0060024	STRONTIUM	5.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0060024	VANADIUM	33.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0070204	TETRYL	0.19	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0070204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	BARIUM	93.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	BERYLLIUM	0.97	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0070204	CALCIUM	263	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	CHROMIUM	28.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	COBALT	15.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	COPPER	11	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	LEAD	13.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	LITHIUM	20.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0070204	MERCURY	0.036	MG/KG	J	DHK	MATRIX SPIKE RECOVERY, ICP INTERFERENCE, AND HOLD TIME NONCOMPLIANCE
X05SB0070204	NICKEL	17.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	POTASSIUM	2200	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	SILVER	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	SODIUM	66.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	STRONTIUM	10	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	TIN	1.7	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	VANADIUM	44.2	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070204	ZINC	50.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0070406	TETRYL	0.19	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0070406	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	BARIUM	73.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0070406	BERYLLIUM	0.86	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0070406	CALCIUM	203	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	CHROMIUM	27.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	COBALT	13.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	COPPER	13.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	LEAD	11.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	LITHIUM	21.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	MERCURY	0.039	MG/KG	J	DHK	MATRIX SPIKE RECOVERY, ICP INTERFERENCE, AND HOLD TIME NONCOMPLIANCE
X05SB0070406	NICKEL	16.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	POTASSIUM	2070	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	SILVER	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0070406	SODIUM	92.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	STRONTIUM	8.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	TIN	1.7	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	VANADIUM	44.4	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0070406	ZINC	48.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070006	NITROGLYCERIN	0.099	MG/KG	J	PU	PERCENT DIFFERENCE BETWEEN COLUMNS NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0070006	ALUMINUM	16400	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0070006	ANTIMONY	0.16	MG/KG	B	A	LAB BLANK CONTAMINATION
X05SS0070006	BARIUM	54.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070006	CALCIUM	172	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070006	CHROMIUM	19.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070006	MERCURY	0.18	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0070006	SELENIUM	0.14	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0070006	SODIUM	43.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070006	STRONTIUM	6.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070006	VANADIUM	33.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070024	ALUMINUM	16100	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0070024	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070024	BARIUM	70.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070024	CALCIUM	188	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070024	CHROMIUM	20.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070024	MERCURY	0.046	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0070024	SODIUM	47.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070024	STRONTIUM	7.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0070024	VANADIUM	30.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0080204	TETRYL	0.19	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0080204	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0080204	BARIUM	71.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	BERYLLIUM	0.83	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0080204	CALCIUM	351	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	CHROMIUM	26.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	COBALT	11.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	COPPER	11.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	LEAD	11.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	LITHIUM	19.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	MERCURY	0.02	MG/KG	L	DH	MATRIX SPIKE RECOVERY AND HOLD TIME NONCOMPLIANCE
X05SB0080204	NICKEL	16	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	POTASSIUM	2120	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	SILVER	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0080204	SODIUM	168	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	STRONTIUM	10.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	TIN	1.7	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	VANADIUM	42.3	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080204	ZINC	42.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0080406	TETRYL	0.19	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0080406	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	BARIUM	33.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	BERYLLIUM	0.4	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0080406	CALCIUM	178	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	CHROMIUM	14.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	COBALT	4.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	COPPER	5.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0080406	LEAD	12	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	LITHIUM	9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	MERCURY	0.016	MG/KG	J	DHKP	MATRIX SPIKE RECOVERY, HOLD TIME, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0080406	NICKEL	7.7	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0080406	POTASSIUM	983	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	SILVER	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	SODIUM	94.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	STRONTIUM	5.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	TIN	0.83	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	VANADIUM	21.9	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0080406	ZINC	21	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0080006	ALUMINUM	10500	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0080006	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080006	BARIUM	45.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080006	BERYLLIUM	0.46	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0080006	CALCIUM	982	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080006	CHROMIUM	25.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080006	MERCURY	0.049	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0080006	SODIUM	43.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080006	STRONTIUM	7.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080006	VANADIUM	29	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080024	ALUMINUM	12300	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0080024	ANTIMONY	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080024	BARIUM	55.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080024	CADMIUM	0.2	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0080024	CALCIUM	688	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080024	CHROMIUM	21.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080024	MERCURY	0.032	MG/KG	K	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0080024	SODIUM	51.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080024	STRONTIUM	7.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0080024	VANADIUM	26.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0090204	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0090204	ARSENIC	3.4	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0090204	BERYLLIUM	0.7	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0090204	COBALT	3.1	MG/KG	L	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0090204	MANGANESE	42.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0090204	MERCURY	0.04	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0090204	POTASSIUM	2950	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0090406	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0090406	ARSENIC	4.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0090406	BERYLLIUM	0.87	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0090406	MANGANESE	91.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0090406	MERCURY	0.026	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0090406	POTASSIUM	2140	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	ARSENIC	4.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	BARIUM	31.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	BERYLLIUM	0.32	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0090006	CADMIUM	0.21	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0090006	CALCIUM	626	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0090006	CHROMIUM	12.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	COBALT	3.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	COPPER	12.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	LEAD	10.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	LITHIUM	4.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	MERCURY	0.93	MG/KG	J	H	HOLD TIME NONCOMPLIANCE
X05SS0090006	NICKEL	7.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	SELENIUM	0.18	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	SILVER	0.08	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	SODIUM	12.6	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0090006	STRONTIUM	7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	VANADIUM	22.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090006	ZINC	18.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0090024	ANTIMONY	0.12	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0090024	ARSENIC	15.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	BARIUM	104	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	BERYLLIUM	0.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	CADMIUM	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	CALCIUM	387	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	CHROMIUM	15.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	COBALT	4.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	COPPER	22.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	LEAD	8.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	LITHIUM	6.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	MERCURY	0.48	MG/KG	J	H	HOLD TIME NONCOMPLIANCE
X05SS0090024	NICKEL	14.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	SELENIUM	0.42	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0090024	SILVER	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	SODIUM	21	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0090024	STRONTIUM	13.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	VANADIUM	21.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0090024	ZINC	16.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0100204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0100204	ARSENIC	3.4	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0100204	BERYLLIUM	0.78	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0100204	MANGANESE	30	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0100204	MERCURY	0.011	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0100204	POTASSIUM	2660	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0100406	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0100406	ARSENIC	2.5	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0100406	MANGANESE	47.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0100406	MERCURY	0.0076	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0100406	POTASSIUM	2220	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	ARSENIC	1.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	BARIUM	38.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	BERYLLIUM	0.73	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	CADMIUM	0.78	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	CALCIUM	1970	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	CHROMIUM	15.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	COBALT	7.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	COPPER	13.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0100006	LEAD	11.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	LITHIUM	7.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	NICKEL	18.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	SELENIUM	0.045	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0100006	SILVER	0.082	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	SODIUM	20.9	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0100006	STRONTIUM	10.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	VANADIUM	24.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100006	ZINC	38.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	ARSENIC	3.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	BARIUM	49.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0100024	BERYLLIUM	0.47	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0100024	CADMIUM	0.27	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	CALCIUM	897	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	CHROMIUM	12.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	COBALT	4.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	COPPER	13.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	LEAD	7.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	LITHIUM	8.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	NICKEL	14.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	SELENIUM	0.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	SILVER	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	SODIUM	20.3	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0100024	STRONTIUM	8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	TIN	1.1	MG/KG	K	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0100024	VANADIUM	18.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0100024	ZINC	25.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0110204	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0110204	ARSENIC	3.1	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0110204	BERYLLIUM	0.73	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0110204	CADMIUM	0.32	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0110204	MANGANESE	57.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0110204	POTASSIUM	1930	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0110406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0110406	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0110406	ARSENIC	3	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0110406	MANGANESE	84.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0110406	MERCURY	0.0075	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0110406	POTASSIUM	2780	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	HMX	4.1	MG/KG	K	CE	CALIBRATION AND LCS RECOVERY NONCOMPLIANCE
X05SS0110006	NITROGLYCERIN	0.16	MG/KG	J	PU	PERCENT DIFFERENCE BETWEEN COLUMNS NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0110006	ANTIMONY	0.042	MG/KG	J	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0110006	ARSENIC	2.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	BARIUM	40.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	BERYLLIUM	0.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	CADMIUM	0.082	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0110006	CALCIUM	1810	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	CHROMIUM	16.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	COBALT	4.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	COPPER	16.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	LEAD	10.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	LITHIUM	12.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	NICKEL	11.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	SILVER	0.082	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	SODIUM	35.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	STRONTIUM	8.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	VANADIUM	24.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110006	ZINC	34.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0110024	ANTIMONY	0.037	MG/KG	J	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0110024	ARSENIC	3.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	BARIUM	44.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	BERYLLIUM	0.51	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	CADMIUM	0.55	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	CALCIUM	809	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	CHROMIUM	17.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	COBALT	4.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	COPPER	35.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	LEAD	11.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	LITHIUM	13.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	MERCURY	0.025	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0110024	NICKEL	11.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0110024	SELENIUM	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	SILVER	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	SODIUM	44	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	STRONTIUM	7.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	VANADIUM	23.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0110024	ZINC	33.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0120204	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	ARSENIC	3.3	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0120204	BARIUM	59.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	BERYLLIUM	0.67	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0120204	CALCIUM	192	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	COBALT	9.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	COPPER	12.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0120204	LEAD	9.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	LITHIUM	18.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	MERCURY	0.021	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0120204	NICKEL	13.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	SELENIUM	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	SODIUM	68.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120204	ZINC	38.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0120406	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	ARSENIC	3.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	BARIUM	49.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	CALCIUM	77	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	COBALT	4.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0120406	COPPER	8.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	LEAD	8.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	LITHIUM	14.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	NICKEL	9.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	SODIUM	78.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0120406	ZINC	27.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120006	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120006	ARSENIC	3.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120006	BARIUM	80.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120006	CALCIUM	290	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120006	CHROMIUM	18.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120006	MERCURY	0.056	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0120006	SELENIUM	0.058	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0120006	SODIUM	44.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120006	STRONTIUM	7.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120006	VANADIUM	33.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120024	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120024	ARSENIC	0.82	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120024	BARIUM	86.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120024	CALCIUM	237	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120024	CHROMIUM	20.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120024	MERCURY	0.012	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0120024	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120024	SILVER	0.14	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0120024	SODIUM	46.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120024	STRONTIUM	6.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0120024	VANADIUM	32.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	ARSENIC	4.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	BARIUM	79.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	CALCIUM	274	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	COBALT	8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	COPPER	13.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	LEAD	12.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	LITHIUM	24.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	NICKEL	17.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	SELENIUM	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130204	SODIUM	73.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0130204	ZINC	45.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130406	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130406	ARSENIC	1.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130406	BERYLLIUM	0.82	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0130406	MANGANESE	216	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130406	MERCURY	0.011	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0130406	POTASSIUM	2470	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0130406	SODIUM	43	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0130006	ALUMINUM	18900	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0130006	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130006	BARIUM	35.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130006	BERYLLIUM	0.39	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0130006	CADMIUM	0.14	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0130006	CALCIUM	191	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130006	CHROMIUM	11.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130006	MERCURY	0.043	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0130006	SELENIUM	0.13	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0130006	SODIUM	25.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130006	STRONTIUM	5.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130006	VANADIUM	21.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130024	ALUMINUM	12000	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0130024	ANTIMONY	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130024	BARIUM	56.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130024	CADMIUM	0.18	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0130024	CALCIUM	174	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130024	CHROMIUM	14.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0130024	MERCURY	0.026	MG/KG	K	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0130024	SODIUM	27.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130024	STRONTIUM	5.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0130024	VANADIUM	23.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0140204	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0140204	ARSENIC	3.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0140204	BERYLLIUM	0.88	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0140204	MANGANESE	130	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0140204	MERCURY	0.039	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0140204	POTASSIUM	2420	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0140406	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0140406	ARSENIC	3.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0140406	BERYLLIUM	0.59	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0140406	MANGANESE	65.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0140406	MERCURY	0.042	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0140406	POTASSIUM	1810	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	ARSENIC	2.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	BARIUM	42.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	BERYLLIUM	0.53	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	CADMIUM	0.31	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	CALCIUM	857	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	CHROMIUM	16.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	COBALT	4.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	COPPER	15.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	LEAD	9.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	LITHIUM	13.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0140006	MERCURY	0.033	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0140006	NICKEL	230	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	SILVER	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	SODIUM	48.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	STRONTIUM	7.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	VANADIUM	25.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140006	ZINC	33.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	ARSENIC	2.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	BARIUM	41.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	BERYLLIUM	0.51	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	CADMIUM	0.15	MG/KG	J	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0140024	CALCIUM	751	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	CHROMIUM	17.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	COBALT	4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	COPPER	18.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	LEAD	9.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	LITHIUM	14.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	MERCURY	0.035	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0140024	NICKEL	73	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	SILVER	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	SODIUM	56.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	STRONTIUM	7.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	VANADIUM	26.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0140024	ZINC	33.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0150204	NITROGLYCERIN	0.12	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0150204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0150204	ARSENIC	2	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0150204	MANGANESE	77.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0150204	MERCURY	0.015	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0150204	POTASSIUM	1440	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0150406	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0150406	ARSENIC	3.7	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0150406	BERYLLIUM	0.8	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0150406	MANGANESE	521	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0150406	MERCURY	0.021	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0150406	NICKEL	13.3	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0150406	POTASSIUM	1780	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0150406	SODIUM	47.8	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150006	HMX	18.3	MG/KG	K	CE	CALIBRATION AND LCS RECOVERY NONCOMPLIANCE
X05SS0150006	NITROGLYCERIN	0.94	MG/KG	J	PU	PERCENT DIFFERENCE BETWEEN COLUMNS NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150006	ANTIMONY	0.044	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150006	ARSENIC	2.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	BARIUM	27.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	BERYLLIUM	0.3	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150006	CADMIUM	0.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	CALCIUM	1830	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	CHROMIUM	12.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	COBALT	2.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0150006	COPPER	17.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	LEAD	15.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	LITHIUM	6.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	NICKEL	7.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	SELENIUM	0.044	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150006	SILVER	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	SODIUM	18.2	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150006	STRONTIUM	6.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	VANADIUM	20.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150006	ZINC	29.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	2,4-DINITROTOLUENE	0.062	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150024	HMX	5.2	MG/KG	K	CE	CALIBRATION AND LCS RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0150024	NITROGLYCERIN	0.22	MG/KG	J	PU	PERCENT DIFFERENCE BETWEEN COLUMNS NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150024	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	ARSENIC	2.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	BARIUM	30.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	BERYLLIUM	0.35	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150024	CADMIUM	0.081	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	CALCIUM	713	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	CHROMIUM	14.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	COBALT	4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	COPPER	20.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	LEAD	19	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	LITHIUM	10.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0150024	MERCURY	0.018	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0150024	NICKEL	7.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	SELENIUM	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	SILVER	0.081	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	SODIUM	27.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	STRONTIUM	5.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	VANADIUM	20.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0150024	ZINC	24	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0160204	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	ARSENIC	3.3	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0160204	BARIUM	192	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	CALCIUM	349	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	COBALT	9.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0160204	COPPER	18	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	LEAD	14	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	LITHIUM	35.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	MERCURY	0.017	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0160204	NICKEL	20.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	SELENIUM	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	SODIUM	465	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160204	ZINC	67.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0160406	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	ARSENIC	5.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	BARIUM	136	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	CALCIUM	306	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0160406	COBALT	7.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	COPPER	16.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	LEAD	14.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	LITHIUM	33.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	MERCURY	0.012	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0160406	NICKEL	18	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	SELENIUM	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	SODIUM	381	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0160406	ZINC	50.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160006	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160006	ARSENIC	4.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160006	BARIUM	57.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160006	BERYLLIUM	0.65	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0160006	CALCIUM	207	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160006	CHROMIUM	19.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160006	MERCURY	0.054	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0160006	SELENIUM	0.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160006	SODIUM	51.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160006	STRONTIUM	7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160006	VANADIUM	33.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160024	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160024	ARSENIC	2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160024	BARIUM	55.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160024	BERYLLIUM	0.64	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0160024	CALCIUM	125	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160024	CHROMIUM	17	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0160024	MERCURY	0.022	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0160024	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160024	SODIUM	37	MG/KG	K	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0160024	STRONTIUM	5.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0160024	VANADIUM	27.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	ARSENIC	3.3	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0170204	BARIUM	73.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	BERYLLIUM	0.87	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0170204	CALCIUM	122	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	COBALT	18	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	COPPER	12.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0170204	LEAD	12.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	LITHIUM	22.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	NICKEL	17.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	SELENIUM	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	SODIUM	102	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170204	ZINC	45.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	ARSENIC	4.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	BARIUM	61.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	BERYLLIUM	0.77	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0170406	CALCIUM	143	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	COBALT	8.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	COPPER	11.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	LEAD	9.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0170406	LITHIUM	17.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	NICKEL	14.1	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0170406	SELENIUM	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	SODIUM	248	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0170406	ZINC	39	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170006	ALUMINUM	18100	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0170006	ANTIMONY	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170006	BARIUM	28.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170006	BERYLLIUM	0.33	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0170006	CALCIUM	168	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170006	CHROMIUM	13.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170006	MERCURY	0.051	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0170006	SELENIUM	0.075	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0170006	SODIUM	22.2	MG/KG	K	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0170006	STRONTIUM	4.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170006	VANADIUM	24	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170024	ALUMINUM	14100	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0170024	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170024	BARIUM	42	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170024	CALCIUM	164	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170024	CHROMIUM	18.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170024	MERCURY	0.042	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0170024	SODIUM	31	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170024	STRONTIUM	5.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0170024	VANADIUM	29.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0180204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0180204	ARSENIC	3.4	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0180204	MANGANESE	207	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0180204	MERCURY	0.0076	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0180204	POTASSIUM	3640	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0180406	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0180406	ARSENIC	1.8	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0180406	MANGANESE	69.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0180406	MERCURY	0.013	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0180406	POTASSIUM	2270	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180006	ALUMINUM	6970	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0180006	ANTIMONY	0.071	MG/KG	B	A	LAB BLANK CONTAMINATION
X05SS0180006	BARIUM	25.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0180006	BERYLLIUM	0.29	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0180006	CADMIUM	0.11	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0180006	CALCIUM	634	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180006	CHROMIUM	10.8	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0180006	MERCURY	0.075	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180006	SODIUM	27.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180006	STRONTIUM	5.2	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0180006	VANADIUM	16.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180024	ALUMINUM	7070	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0180024	ANTIMONY	0.065	MG/KG	UJ	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180024	BARIUM	35.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180024	BERYLLIUM	0.47	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0180024	CALCIUM	594	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180024	CHROMIUM	15.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0180024	MERCURY	0.066	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180024	SODIUM	49.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180024	STRONTIUM	6.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0180024	VANADIUM	22.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0190204	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0190204	ARSENIC	2.2	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0190204	BERYLLIUM	0.83	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0190204	MANGANESE	154	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0190204	MERCURY	0.019	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0190204	POTASSIUM	2360	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0190406	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0190406	ARSENIC	4.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0190406	BERYLLIUM	0.76	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0190406	MANGANESE	170	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0190406	MERCURY	0.011	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0190406	POTASSIUM	2070	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190006	HMX	0.94	MG/KG	K	E	LCS RECOVERY NONCOMPLIANCE
X05SS0190006	NITROGLYCERIN	0.22	MG/KG	J	PU	PERCENT DIFFERENCE BETWEEN COLUMNS NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0190006	ALUMINUM	10300	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0190006	ANTIMONY	0.078	MG/KG	B	A	LAB BLANK CONTAMINATION
X05SS0190006	BARIUM	37.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190006	BERYLLIUM	0.46	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0190006	CALCIUM	3230	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190006	CHROMIUM	16	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190006	MERCURY	0.16	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0190006	SODIUM	42.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190006	STRONTIUM	11	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0190006	VANADIUM	27.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190024	2,4-DINITROTOLUENE	0.13	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0190024	HMX	4	MG/KG	K	CE	CALIBRATION AND LCS RECOVERY NONCOMPLIANCE
X05SS0190024	NITROGLYCERIN	0.087	MG/KG	J	PU	PERCENT DIFFERENCE BETWEEN COLUMNS NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0190024	ALUMINUM	9090	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0190024	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190024	BARIUM	34.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190024	BERYLLIUM	0.43	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0190024	CALCIUM	2140	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190024	CHROMIUM	15.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190024	MERCURY	0.089	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0190024	SODIUM	35.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0190024	STRONTIUM	8.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0190024	VANADIUM	24.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	2,4-DINITROTOLUENE	0.11	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0200204	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0200204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	BARIUM	41.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	BERYLLIUM	0.72	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	CADMIUM	0.56	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0200204	CALCIUM	2130	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	CHROMIUM	16.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	COBALT	6.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	COPPER	19.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	LEAD	11.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	LITHIUM	8.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	MERCURY	0.043	MG/KG	J	DHK	MATRIX SPIKE RECOVERY, ICP INTERFERENCE, AND HOLD TIME NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0200204	NICKEL	11.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	POTASSIUM	1080	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	SODIUM	36.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	STRONTIUM	10.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	TIN	0.83	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	VANADIUM	28.6	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200204	ZINC	35.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	2,4-DINITROTOLUENE	0.05	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0200406	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0200406	ANTIMONY	0.059	MG/KG	J	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0200406	BARIUM	57.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	BERYLLIUM	0.66	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0200406	CADMIUM	8.5	MG/KG	J	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0200406	CALCIUM	1490	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	CHROMIUM	18.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	COBALT	8.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	COPPER	19.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	LEAD	12.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	LITHIUM	13.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	MERCURY	0.04	MG/KG	J	DHK	MATRIX SPIKE RECOVERY, ICP INTERFERENCE, AND HOLD TIME NONCOMPLIANCE
X05SB0200406	NICKEL	12	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	POTASSIUM	1420	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	SILVER	0.082	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	SODIUM	39.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0200406	STRONTIUM	10	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	VANADIUM	30	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0200406	ZINC	63.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200006	ALUMINUM	11000	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0200006	ANTIMONY	0.063	MG/KG	UJ	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200006	BARIUM	36.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200006	CALCIUM	2830	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200006	CHROMIUM	14.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200006	MERCURY	0.21	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0200006	SELENIUM	0.088	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0200006	SODIUM	28.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200006	STRONTIUM	11	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200006	VANADIUM	26.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0200024	ARSENIC	1.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	BARIUM	39.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	BERYLLIUM	0.69	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	CADMIUM	0.66	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	CALCIUM	2130	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	CHROMIUM	15.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	COBALT	6.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	COPPER	22.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	LEAD	12.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	LITHIUM	7.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	NICKEL	14.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	SELENIUM	0.07	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0200024	SILVER	0.082	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0200024	SODIUM	32.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	STRONTIUM	10.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	VANADIUM	24.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0200024	ZINC	36.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0210204	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0210204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0210204	ARSENIC	1.6	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0210204	BERYLLIUM	0.4	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0210204	MANGANESE	79	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0210204	MERCURY	0.014	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0210204	POTASSIUM	1030	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0210204	SODIUM	21.5	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0210406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0210406	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0210406	ARSENIC	0.61	MG/KG	L	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0210406	CADMIUM	0.38	MG/KG	K	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0210406	MANGANESE	119	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0210406	MERCURY	0.013	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0210406	POTASSIUM	1420	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	ARSENIC	1.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	BARIUM	33.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	BERYLLIUM	0.42	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0210006	CADMIUM	0.14	MG/KG	J	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0210006	CALCIUM	1490	MG/KG	J	DG	MATRIX SPIKE RECOVERY AND FIELD DUPLICATE PRECISION NONCOMPLIANCE
X05SS0210006	CHROMIUM	14.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	COBALT	4.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	COPPER	10	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	LEAD	8.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	LITHIUM	11.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	MERCURY	0.018	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0210006	NICKEL	10.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	SILVER	0.082	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	SODIUM	26.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	STRONTIUM	7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006	VANADIUM	21.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0210006	ZINC	27.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	ARSENIC	1.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	BARIUM	34.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	BERYLLIUM	0.4	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0210006-D	CADMIUM	0.35	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	CALCIUM	2500	MG/KG	J	DG	MATRIX SPIKE RECOVERY AND FIELD DUPLICATE PRECISION NONCOMPLIANCE
X05SS0210006-D	CHROMIUM	13.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	COBALT	4.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	COPPER	11.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	LEAD	9.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	LITHIUM	10.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0210006-D	MERCURY	0.022	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0210006-D	NICKEL	9.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	SILVER	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	SODIUM	29.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	STRONTIUM	8.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	VANADIUM	21.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210006-D	ZINC	30.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	ARSENIC	2.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	BARIUM	35.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	BERYLLIUM	0.41	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0210024	CADMIUM	0.31	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0210024	CALCIUM	2210	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	CHROMIUM	14.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	COBALT	5.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	COPPER	12.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	LEAD	10.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	LITHIUM	11.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	MERCURY	0.03	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0210024	NICKEL	9.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	SILVER	0.083	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	SODIUM	28.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	STRONTIUM	8.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	VANADIUM	23	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0210024	ZINC	30.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0220204	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0220204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204	ARSENIC	3.4	MG/KG	J	DIG	MATRIX SPIKE RECOVERY, FIELD DUPLICATE PRECISION, AND ICP SERIAL DILUTION NONCOMPLIANCE
X05SB0220204	BARIUM	112	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204	CALCIUM	314	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204	COBALT	14.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204	COPPER	11.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204	LEAD	13.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204	LITHIUM	21.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204	MANGANESE	616	MG/KG	J	G	FIELD DUPLICATE PRECISION NONCOMPLIANCE
X05SB0220204	MERCURY	0.025	MG/KG	J	K	ICP INTERFERENCE NONCOMPLIANCE
X05SB0220204	NICKEL	17.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204	SELENIUM	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204	SODIUM	60.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0220204	ZINC	46.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204-D	ANTIMONY	0.032	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204-D	ARSENIC	1.2	MG/KG	J	DGK	MATRIX SPIKE RECOVERY, FIELD DUPLICATE PRECISION, AND ICP INTERFERENCE NONCOMPLIANCE
X05SB0220204-D	BERYLLIUM	0.9	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0220204-D	MANGANESE	288	MG/KG	J	DG	MATRIX SPIKE RECOVERY AND FIELD DUPLICATE PRECISION NONCOMPLIANCE
X05SB0220204-D	POTASSIUM	2630	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204-D	SILVER	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220204-D	TIN	1.7	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0220406	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	ARSENIC	4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	BARIUM	53.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	BERYLLIUM	0.54	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0220406	CALCIUM	130	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	COBALT	4.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	COPPER	11.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	LEAD	8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	LITHIUM	16.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	MERCURY	0.022	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0220406	NICKEL	8.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0220406	SODIUM	49.2	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0220406	ZINC	27	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220006	ANTIMONY	0.12	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220006	ARSENIC	3.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0220006	BARIUM	76.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220006	BERYLLIUM	0.74	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0220006	CALCIUM	488	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220006	CHROMIUM	21.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220006	MERCURY	0.099	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220006	SELENIUM	0.072	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0220006	SODIUM	37.3	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0220006	STRONTIUM	8.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220006	VANADIUM	34.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220024	ALUMINUM	11300	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0220024	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220024	ARSENIC	3.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0220024	BARIUM	113	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220024	BERYLLIUM	0.95	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0220024	CALCIUM	338	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220024	CHROMIUM	22.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220024	MERCURY	0.037	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220024	SELENIUM	0.24	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220024	SILVER	0.19	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0220024	SODIUM	48.7	MG/KG	K	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0220024	STRONTIUM	8.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0220024	VANADIUM	33.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	ARSENIC	3.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	BARIUM	58.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0230204	BERYLLIUM	0.81	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0230204	CALCIUM	171	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	COBALT	13	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	COPPER	11.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	LEAD	10.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	LITHIUM	19.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	MERCURY	0.0083	MG/KG	J	KP	ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0230204	NICKEL	13.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	SELENIUM	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	SODIUM	66.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230204	ZINC	38.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0230406	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0230406	ARSENIC	3.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	BARIUM	72.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	BERYLLIUM	0.88	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0230406	CALCIUM	194	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	COBALT	13.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	COPPER	12.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	LEAD	11.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	LITHIUM	22.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	NICKEL	18.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	SELENIUM	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	SODIUM	116	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0230406	ZINC	49.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230006	ANTIMONY	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230006	ARSENIC	0.88	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0230006	BARIUM	37.4	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230006	BERYLLIUM	0.37	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0230006	CALCIUM	156	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230006	CHROMIUM	13.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230006	MERCURY	0.015	MG/KG	L	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0230006	SELENIUM	0.033	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230006	SODIUM	20.3	MG/KG	K	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0230006	STRONTIUM	4.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230006	VANADIUM	26.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230024	ANTIMONY	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230024	ARSENIC	2.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230024	BARIUM	48.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0230024	BERYLLIUM	0.48	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0230024	CALCIUM	121	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230024	CHROMIUM	14.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230024	MERCURY	0.046	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230024	SELENIUM	0.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230024	SODIUM	33	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230024	STRONTIUM	5.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0230024	VANADIUM	25.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0240204	NITROGLYCERIN	0.084	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0240204	ANTIMONY	0.064	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	BARIUM	35.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	BERYLLIUM	0.59	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0240204	CALCIUM	108	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	CHROMIUM	21.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	COBALT	6.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	COPPER	9.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	LEAD	8.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	LITHIUM	13.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	MERCURY	0.0075	MG/KG	J	DHKP	MATRIX SPIKE RECOVERY, HOLD TIME, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0240204	NICKEL	8.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	POTASSIUM	1410	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	SILVER	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0240204	SODIUM	32.8	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0240204	STRONTIUM	5.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	TIN	1.7	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	VANADIUM	27	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240204	ZINC	26.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0240406	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	BARIUM	39.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	BERYLLIUM	0.65	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0240406	CALCIUM	131	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	CHROMIUM	23.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	COBALT	23.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0240406	COPPER	10	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	LEAD	9.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	LITHIUM	14	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	MERCURY	0.011	MG/KG	J	DHKP	MATRIX SPIKE RECOVERY, HOLD TIME, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0240406	NICKEL	10.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	POTASSIUM	1530	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	SILVER	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	SODIUM	39.7	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0240406	STRONTIUM	5.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	TIN	1.6	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0240406	VANADIUM	30.1	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0240406	ZINC	29.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240006	ALUMINUM	13700	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0240006	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240006	BARIUM	48.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240006	CADMIUM	0.098	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0240006	CALCIUM	247	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240006	CHROMIUM	18	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240006	MERCURY	0.042	MG/KG	K	DK	MATRIX SPIKE RECOVERY AND ICP INTERFERENCE NONCOMPLIANCE
X05SS0240006	SODIUM	47.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240006	STRONTIUM	7.3	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240006	VANADIUM	33.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240024	ALUMINUM	14900	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0240024	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0240024	BARIUM	49.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240024	CALCIUM	183	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240024	CHROMIUM	21.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240024	MERCURY	0.018	MG/KG	K	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0240024	SODIUM	41.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240024	STRONTIUM	6.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0240024	VANADIUM	32.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0250204	TETRYL	0.2	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0250204	ANTIMONY	0.063	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	BARIUM	64.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	BERYLLIUM	0.81	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0250204	CALCIUM	218	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0250204	CHROMIUM	24.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	COBALT	12.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	COPPER	11	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	LEAD	10.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	LITHIUM	18.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	MERCURY	0.028	MG/KG	J	DHKP	MATRIX SPIKE RECOVERY, HOLD TIME, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0250204	NICKEL	15.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	POTASSIUM	1960	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	SILVER	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	SODIUM	57.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	STRONTIUM	8.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0250204	TIN	1.6	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	VANADIUM	39.5	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250204	ZINC	43.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	HMX	0.2	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0250406	TETRYL	0.2	MG/KG	UJ	C	CALIBRATION NONCOMPLIANCE
X05SB0250406	ALUMINUM	13100	MG/KG	J	G	FIELD DUPLICATE PRECISION NONCOMPLIANCE
X05SB0250406	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	BARIUM	63.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	BERYLLIUM	0.73	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0250406	CALCIUM	161	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	CHROMIUM	24.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	COBALT	8.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	COPPER	10.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	LEAD	10	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

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SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0250406	LITHIUM	19.7	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	MERCURY	0.013	MG/KG	J	DHKP	MATRIX SPIKE RECOVERY, HOLD TIME, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0250406	NICKEL	14.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	POTASSIUM	1980	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	SILVER	0.17	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	SODIUM	68.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	STRONTIUM	7.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	TIN	1.7	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	VANADIUM	37.3	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406	ZINC	40.3	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	HMX	0.19	MG/KG	UL	E	LCS RECOVERY NONCOMPLIANCE
X05SB0250406-D	ALUMINUM	25300	MG/KG	J	G	FIELD DUPLICATE PRECISION NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

108 OF 111

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0250406-D	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	BARIUM	52.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	BERYLLIUM	0.63	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0250406-D	CALCIUM	126	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	CHROMIUM	20.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	COBALT	9.1	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	COPPER	10.2	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	LEAD	9.5	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	LITHIUM	17.4	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	MERCURY	0.014	MG/KG	J	DHKP	MATRIX SPIKE RECOVERY, HOLD TIME, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0250406-D	NICKEL	12.9	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

109 OF 111

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SB0250406-D	POTASSIUM	1340	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	SELENIUM	0.16	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	SODIUM	47.8	MG/KG	J	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SB0250406-D	STRONTIUM	5.8	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	VANADIUM	32	MG/KG	J	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SB0250406-D	ZINC	36.6	MG/KG	L	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250006	ALUMINUM	7570	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0250006	ANTIMONY	0.065	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250006	BARIUM	32	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250006	BERYLLIUM	0.33	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0250006	CALCIUM	192	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250006	CHROMIUM	10.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

110 OF 111

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0250006	MERCURY	0.031	MG/KG	K	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0250006	SELENIUM	0.14	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0250006	SODIUM	24.5	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250006	STRONTIUM	5.2	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250006	VANADIUM	21.8	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250024	ALUMINUM	9410	MG/KG	J	I	ICP SERIAL DILUTION NONCOMPLIANCE
X05SS0250024	ANTIMONY	0.066	MG/KG	UL	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250024	BARIUM	46.1	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250024	BERYLLIUM	0.44	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0250024	CALCIUM	168	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250024	CHROMIUM	10.6	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250024	MERCURY	0.014	MG/KG	K	DKP	MATRIX SPIKE RECOVERY, ICP INTERFERENCE NONCOMPLIANCE, AND UNCERTAINITY NEAR THE DETECTION LIMIT

TABLE 1

QUALIFIED DATA
NAVAL SUPPORT FACILITY ADVANCED IED AREA - UXO 05
SITE INVESTIGATION
NSF INDIAN HEAD - STUMP NECK
INDIAN HEAD, MARYLAND

111 OF 111

SAMPLE NUMBER	PARAMETER	SAMPLE RESULT	UNIT	VALIDATION QUALIFIER	QUALIFICATION CODE	REASON FOR QUALIFICATION
X05SS0250024	SELENIUM	0.12	MG/KG	J	P	UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0250024	SODIUM	21.5	MG/KG	K	DP	MATRIX SPIKE RECOVERY NONCOMPLIANCE AND UNCERTAINITY NEAR THE DETECTION LIMIT
X05SS0250024	STRONTIUM	4.9	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE
X05SS0250024	VANADIUM	16.7	MG/KG	K	D	MATRIX SPIKE RECOVERY NONCOMPLIANCE

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

parameter															x01ss00100		x01ss00102		x01ss00200		x01ss00202
nsample															X01SS0010006		X01SS0010024		X01SS0020006		X01SS0020024
location															X01SB001		X01SB001		X01SB002		X01SB002
project_no															00810_2010060		00810_2010060		00810_2010052		00810_2010052
sample_coc															X01SS0010006		X01SS0010024		X01SS0020006		X01SS0020024
gis_date															20100317		20100317		20100316		20100316
qc_type															NM		NM		NM		NM
sacode															NORMAL		NORMAL		NORMAL		NORMAL
matrix															SO		SO		SO		SO
duplicate																					
top_depth																0.00		0.00		0.00	
bottom_dep																0.50		2.00		0.50	
depth_unit															FT		FT		FT		FT
z															001		003		005		007
x	utl95cv	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	lanl	reference	c_001		c_003		c_005		c_007
Explosives (mg/kg)																					
1,3,5-TRINITROBENZENE	NA	9	220	N	NA	NA	NA	NA	NA	NA	9	18	NC	Sunahara Plant	0.19	U	0.19	U	0.2	U	0.2
1,3-DINITROBENZENE	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.19	U	0.19	U	0.2	U	0.2
2,4,6-TRINITROTOLUENE	NA	3.6	3.6		NA	NA	NA	NA	NA	NA	6	12	NC	ORNL-R	0.24	U	0.24	U	0.25	U	0.25
2,4-DINITROTOLUENE	NA	0.57	1.6	C	16	0.57	NA	NA	NA	NA	6	20	NC	MDE Cleanup Standard S-GW	0.19	U	0.19	U	0.2	U	0.2
2,6-DINITROTOLUENE	NA	0.25	6.1	N	7.8	0.25	NA	NA	NA	NA	5	7	NC	MDE Cleanup Standard S-GW	0.19	U	0.19	U	0.2	U	0.2
2-AMINO-4,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NC	NC	80	ORNL-R	0.19	U	0.19	U	0.2	U	0.2
2-NITROTOLUENE	0.15	2.9	2.9	C	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.19	U	0.19	U	0.2	U	0.2
3,5-DINITROANILINE	NA	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	0.24	U	0.24	U	0.25	U	0.25
3-NITROTOLUENE	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.19	U	0.19	U	0.2	U	0.2
4-AMINO-2,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.19	U	0.19	U	0.2	U	0.2
4-NITROTOLUENE	0.21	30	30	C	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.19	U	0.19	U	0.2	U	0.2
HMX	NA	380	380	N	NA	NA	NA	NA	NA	NA	9341	600	NC	ORNL-R	0.19	UL	0.19	UL	0.2	UL	0.2
NITROBENZENE	NA	0.023	4.8	C	3.9	0.023	NA	NA	NA	40	NC	NC	NC	MDE Cleanup Standard S-GW	0.19	U	0.19	U	0.2	U	0.2
NITROGLYCERIN	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	**0.095**	**J**	1.2	U	1.2	U	1.2
PETN	NA	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	1.1	U	1.2	U	1.2	U	1.2
RDX	NA	5.5	5.5	C	NA	NA	NA	NA	NA	NA	9537	98	NC	ORNL-R	0.19	U	0.19	U	0.2	U	0.2
TETRYL	NA	24	24	N	NA	NA	NA	NA	NA	NA	NC	NC	25	ORNL-R	0.19	U	0.19	U	0.2	U	0.2
Miscellaneous																					
CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								
PERCENT MOISTURE (%)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								
PH (s.u.)	8.8	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								
TOTAL ORGANIC CARBON (mg/kg)	57200	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								
TOTAL SOLIDS (%)	79.2	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA								

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is

actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	x01ss00300		x01ss00302		x01ss00400		x01ss00402		x01ss00500		x01ss00502		x01ss00600		x01ss00602		x01ss00700	
	X01SS0030006		X01SS0030024		X01SS0040006		X01SS0040024		X01SS0050006		X01SS0050024		X01SS0060006		X01SS0060024		X01SS0070006	
	X01SB003		X01SB003		X01SB004		X01SB004		X01SB005		X01SB005		X01SB006		X01SB006		X01SB007	
	00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010052		00810_2010052		00810_2010060		00810_2010060		00810_201006(	
	X01SS0030006		X01SS0030024		X01SS0040006		X01SS0040024		X01SS0050006		X01SS0050024		X01SS0060006		X01SS0060024		X01SS0070006	
	20100317		20100317		20100317		20100317		20100316		20100316		20100317		20100317		20100317	
	NM		NM		NM		NM		NM		NM		NM		NM		NM	
	NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	SO		SO		SO		SO		SO		SO		SO		SO		SO	
0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		
	FT		FT		FT		FT		FT		FT		FT		FT		FT	
	009		011		013		015		017		019		021		023		025	
	c_009		c_011		c_013		c_015		c_017		c_019		c_021		c_023		c_025	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.24	U	0.24	U	0.24	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.24	U	0.24	U	0.24	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	U	0.19	UL	0.2	UL	0.19	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	
U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	U	1.2	U	1.1	UJ	1.2	UJ	1.2	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	
U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	x01ss00702		x01ss00800		x01ss00802		x01ss00900		x01ss01000		x01ss01002		x01ss01100		x01ss01102		x01ss01200
	X01SS0070024		X01SS0080006		X01SS0080024		X01SS0090006		X01SS0100006		X01SS0100024		X01SS0110006		X01SS0110024		X01SS0120006
	X01SB007		X01SB008		X01SB008		X01SB009		X01SB010		X01SB010		X01SB011		X01SB011		X01SB012
)	00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010052		00810_2010052		00810_2010052
	X01SS0070024		X01SS0080006		X01SS0080024		X01SS0090006		X01SS0100006		X01SS0100024		X01SS0110006		X01SS0110024		X01SS0120006
	20100317		20100317		20100317		20100317		20100317		20100317		20100316		20100316		20100316
	NM		NM		NM		NM		NM		NM		NM		NM		NM
	NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL
	SO		SO		SO		SO		SO		SO		SO		SO		SO
0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
0.50		2.00		0.50		2.00		0.50		0.50		2.00		0.50		2.00	
	FT		FT		FT		FT		FT		FT		FT		FT		FT
	027		029		031		033		035		037		039		041		043
	c_027		c_029		c_031		c_033		c_035		c_037		c_039		c_041		c_043
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.23	U	0.23	U	0.25	U	0.24	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.23	U	0.23	U	0.25	U	0.24	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
UL	0.19	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	U	0.2	U	0.2
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	1.1	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
UJ	1.1	UJ	1.1	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ	1.2	U	1.2	U	1.2
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
															57.4		
															17		
															4.53		
															3340		
															83 [BKG]		

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	x01ss01202		x01ss01300		x01ss01302		x01ss01400		x01ss01402		x01ss01500		x01ss01502		x01ss01600		x01ss01602
	X01SS0120024		X01SS0130006		X01SS0130024		X01SS0140006		X01SS0140024		X01SS0150006		X01SS0150024		X01SS0160006		X01SS0160024
	X01SB012		X01SB013		X01SB013		X01SB014		X01SB014		X01SB015		X01SB015		X01SB016		X01SB016
	00810_2010052		00810_2010052		00810_2010052		00810_2010060		00810_2010060		00810_2010052		00810_2010052		00810_2010052		00810_2010052
	X01SS0120024		X01SS0130006		X01SS0130024		X01SS0140006		X01SS0140024		X01SS0150006		X01SS0150024		X01SS0160006		X01SS0160024
	20100316		20100316		20100316		20100317		20100317		20100316		20100316		20100316		20100316
	NM		NM		NM		NM		NM		NM		NM		NM		NM
	NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL
	SO		SO		SO		SO		SO		SO		SO		SO		SO
0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50	
	FT		FT		FT		FT		FT		FT		FT		FT		FT
	045		047		049		051		053		055		057		059		061
	c_045		c_047		c_049		c_051		c_053		c_055		c_057		c_059		c_061
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.19	U	0.2	U	0.2	U	0.2
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2
U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ	1.1	U	1.2	U	1.2	U	1.2
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	x01ss01700		x01ss01702		x01ss01800		x01ss01802		x01ss01803		x01ss01805		x01ss01900		x01ss01901		x01ss01903	
	X01SS0170006		X01SS0170024		X01SS0180006		X01SS0180024		X01SS0180024-AVG		X01SS0180024-D		X01SS0190006		X01SS0190006-AVG		X01SS0190006	
	X01SB017		X01SB017		X01SB018		X01SB018		X01SB018		X01SB018		X01SB019		X01SB019		X01SB019	
	00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052	
	X01SS0170006		X01SS0170024		X01SS0180006		X01SS0180024		X01SS0180024-AVG		FD031610-05		X01SS0190006		X01SS0190006-AVG		FD031610-04	
	20100316		20100316		20100316		20100316		20100316		20100316		20100316		20100316		20100316	
	NM		NM		NM		NM		NM		FD		NM		NM		FD	
	NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP		ORIG		AVG		DUP	
	SO		SO		SO		SO		SO		SO		SO		SO		SO	
											X01SS0180024						X01SS0190006	
0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
2.00		0.50		2.00		0.50		2.00		2.00		2.00		0.50		0.50		
	FT		FT		FT		FT		FT		FT		FT		FT		FT	
	063		065		067		069		070		072		075		076		078	
	c_063		c_065		c_067		c_069		c_070		c_072		c_075		c_076		c_078	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	1.2	U	1.2	U	**0.09**	**J**	1.2	U	1.2	U	1.2	U	1.2	U	**0.14**	**J**	**0.14**	
U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
													28.8		28.8			
													17		17			
													4.18		4.18			
													6690		6690			
													83 [BKG]		**83 [BKG]**			

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	x01ss01906		x01ss02000		x01ss02002	
-D	X01SS0190024		X01SS0200006		X01SS0200024	
	X01SB019		X01SB020		X01SB020	
?	00810_2010052		00810_2010052		00810_2010052	
	X01SS0190024		X01SS0200006		X01SS0200024	
	20100316		20100316		20100316	
	NM		NM		NM	
	NORMAL		NORMAL		NORMAL	
	SO		SO		SO	
0.00		0.00		0.00		0.00
0.50		2.00		0.50		2.00
	FT		FT		FT	
	081		083		085	
	c_081		c_083		c_085	
U	0.18	U	0.2	U	0.2	U
U	0.18	U	0.2	U	0.2	U
U	0.23	U	0.24	U	0.25	U
U	0.18	U	0.2	U	0.2	U
U	0.18	U	0.2	U	0.2	U
U	0.18	U	0.2	U	0.2	U
U	0.18	U	0.2	U	0.2	U
U	0.23	U	0.24	U	0.25	U
U	0.18	U	0.2	U	0.2	U
U	0.18	U	0.2	U	0.2	U
U	0.18	U	0.2	U	0.2	U
U	0.18	U	0.2	U	0.2	U
U	0.18	U	0.2	U	0.2	U
J	1.1	U	1.2	U	1.2	U
U	1.1	U	1.2	U	1.2	U
U	0.18	U	0.2	U	0.2	U
U	0.18	U	0.2	U	0.2	U

TABLE 4-4

SURFACE SOIL RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

TABLE 4-5

SUBSURFACE SOIL SAMPLING RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample															X01SB0020204		X01SB0030204		X01S
	location															X01SB002		X01SB003		X0
	project_no															00810_2010052		00810_2010052		0081
	sample_coc															X01SB0020204		X01SB0030204		X01S
	gis_date															20100316		20100316		2(
	qc_type															NM		NM		
	sacode															NORMAL		NORMAL		
	matrix															SO		SO		
	duplicate																			
	top_depth																2.00		2.00	
	bottom_dep																4.00		4.00	
	depth_unit															FT		FT		
	submatrix															SB		SB		
	z															001		003		
cas	x	utl95	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	lanl	reference	c_001		c_003		
	Explosives (mg/kg)																			
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	N	NA	NA	NA	NA	NA	NA	9	18	NA	Sunahara Plant	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	ORNL-R	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	3.6		NA	NA	NA	NA	NA	NA	6	12	NA	ORNL-R	0.25	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	C	16	0.57	NA	NA	NA	NA	6	20	NA	MDE Cleanup Standard S-GW	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	N	7.8	0.25	NA	NA	NA	NA	5	7	NA	MDE Cleanup Standard S-GW	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NA	NA	80	ORNL-R	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	C	NA	NA	NA	NA	NA	NA	NA	NA	NA	ORNL-R	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.25	U	0.25	U	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	ORNL-R	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	ORNL-R	0.2	U	0.2	U	0.2
99-99-0	4-NITROTOLUENE	NA	30	30	C	NA	NA	NA	NA	NA	NA	NA	NA	NA	ORNL-R	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	380	N	NA	NA	NA	NA	NA	NA	9341	600	NA	ORNL-R	0.2	UL	0.2	UL	0.2
98-95-3	NITROBENZENE	NA	0.023	4.8	C	3.9	0.023	NA	NA	NA	40	NA	NA	NA	MDE Cleanup Standard S-GW	0.2	U	0.2	U	0.2
55-63-0	NITROGLYCERIN	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA	NA	ORNL-R	1.2	U	1.2	U	1.2
78-11-5	PETN	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.2	U	1.2	U	1.2
121-82-4	RDX	NA	5.5	5.5	C	NA	NA	NA	NA	NA	NA	9537	98	NA	ORNL-R	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	24	N	NA	NA	NA	NA	NA	NA	NA	NA	25	ORNL-R	0.2	U	0.2	U	0.2
	Miscellaneous																			
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		42.4				
TTNUS288	PERCENT MOISTURE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		17.1				
TTNUS002	PH (s.u.)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		4.85				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		919				
TTNUS046	TOTAL SOLIDS (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		82.9				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present

in the sample. The laboratory reported concentration is an estimate of the true concentration.

TABLE 4-5

SUBSURFACE SOIL SAMPLING RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample													SB0110204	X01SB0110204-AVG	X01SB0110204-D	X01S
	location													01SB011	X01SB011	X01SB011	X(
	project_no													0_2010052	00810_2010052	00810_2010052	0081
	sample_coc													SB0110204	X01SB0110204-AVG	FD031610-01	X01S
	gis_date													0100316	20100316	20100316	2(
	qc_type													NM	NM	FD	
	sacode													DUP	AVG	DUP	N
	matrix													SO	SO	SO	
	duplicate															X01SB0110204	
	top_depth													2.00	2.00	2.00	
	bottom_dep													4.00	4.00	4.00	
	depth_unit													FT	FT	FT	
	submatrix													SB	SB	SB	
	z													005	006	008	
cas	x	utl95	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	c_005	c_006	c_008	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	N	NA	NA	NA	NA	NA	NA	9	18	U	0.20	U 0.2	U 0.2
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.20	U 0.2	U 0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	3.6		NA	NA	NA	NA	NA	NA	6	12	U	0.25	U 0.25	U 0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	C	16	0.57	NA	NA	NA	NA	6	20	U	0.20	U 0.2	U 0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	N	7.8	0.25	NA	NA	NA	NA	5	7	U	0.20	U 0.2	U 0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.20	U 0.2	U 0.2
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	C	NA	NA	NA	NA	NA	NA	NA	NA	U	0.20	U 0.2	U 0.2
618-87-1	3,5-DINITROANILINE	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	U	0.25	U 0.25	U 0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.20	U 0.2	U 0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.20	U 0.2	U 0.2
99-99-0	4-NITROTOLUENE	NA	30	30	C	NA	NA	NA	NA	NA	NA	NA	NA	U	0.20	U 0.2	U 0.2
2691-41-0	HMX	NA	380	380	N	NA	NA	NA	NA	NA	NA	9341	600	UL	0.20	UL 0.2	UL 0.2
98-95-3	NITROBENZENE	NA	0.023	4.8	C	3.9	0.023	NA	NA	NA	40	NA	NA	U	0.20	U 0.2	U 0.2
55-63-0	NITROGLYCERIN	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA	U	1.2	U 1.2	U 1.2
78-11-5	PETN	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	U	1.2	U 1.2	U 1.2
121-82-4	RDX	NA	5.5	5.5	C	NA	NA	NA	NA	NA	NA	9537	98	U	0.20	U 0.2	U 0.2
479-45-8	TETRYL	NA	24	24	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.20	U 0.2	U 0.2
	Miscellaneous																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
TTNUS288	PERCENT MOISTURE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
TTNUS002	PH (s.u.)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				
TTNUS046	TOTAL SOLIDS (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present

in the sample. The laboratory reported concentration is an estimate of the true concentration.

TABLE 4-5

SUBSURFACE SOIL SAMPLING RESULTS
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample													SB0120204		X01SB0180204		X01SB0190204	
	location													01SB012		X01SB018		X01SB019	
	project_no													0_2010052		00810_2010052		00810_2010052	
	sample_coc													SB0120204		X01SB0180204		X01SB0190204	
	gis_date													0100316		20100316		20100316	
	qc_type													NM		NM		NM	
	sacode													ORMAL		NORMAL		NORMAL	
	matrix													SO		SO		SO	
	duplicate																		
	top_depth														2.00		2.00		2.00
	bottom_dep														4.00		4.00		4.00
	depth_unit													FT		FT		FT	
	submatrix													SB		SB		SB	
	z													011		013		015	
cas	x	utl95	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	c_011		c_013		c_015	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	N	NA	NA	NA	NA	NA	NA	9	18	U	0.2	U	0.2	U	
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.2	U	0.2	U	
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	3.6		NA	NA	NA	NA	NA	NA	6	12	U	0.25	U	0.25	U	
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	C	16	0.57	NA	NA	NA	NA	6	20	U	0.2	U	0.2	U	
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	N	7.8	0.25	NA	NA	NA	NA	5	7	U	0.2	U	0.2	U	
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.2	U	0.2	U	
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	C	NA	NA	NA	NA	NA	NA	NA	NA	U	0.2	U	0.2	U	
618-87-1	3,5-DINITROANILINE	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	U	0.25	U	0.25	U	
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.2	U	0.2	U	
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.2	U	0.2	U	
99-99-0	4-NITROTOLUENE	NA	30	30	C	NA	NA	NA	NA	NA	NA	NA	NA	U	0.2	U	0.2	U	
2691-41-0	HMX	NA	380	380	N	NA	NA	NA	NA	NA	NA	9341	600	UL	0.2	UL	0.2	UL	
98-95-3	NITROBENZENE	NA	0.023	4.8	C	3.9	0.023	NA	NA	NA	40	NA	NA	U	0.2	U	0.2	U	
55-63-0	NITROGLYCERIN	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA	U	1.2	U	1.2	U	
78-11-5	PETN	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	U	1.2	U	1.2	U	
121-82-4	RDX	NA	5.5	5.5	C	NA	NA	NA	NA	NA	NA	9537	98	U	0.2	U	0.2	U	
479-45-8	TETRYL	NA	24	24	N	NA	NA	NA	NA	NA	NA	NA	NA	U	0.2	U	0.2	U	
	Miscellaneous																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						
TTNUS288	PERCENT MOISTURE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						
TTNUS002	PH (s.u.)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						
TTNUS046	TOTAL SOLIDS (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present

in the sample. The laboratory reported concentration is an estimate of the true concentration.

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA B (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter													x02ss00100		x02ss00102		x02ss00200		x02ss00202		x02ss00300		x02ss00302		x02ss00400		x02ss00402	
	nsample													X02SS0010006		X02SS0010024		X02SS0020006		X02SS0020024		X02SS0030006		X02SS0030024		X02SS0040006		X02SS0040024	
	location													X02SB001		X02SB001		X02SB002		X02SB002		X02SB003		X02SB003		X02SB004		X02SB004	
	project_no													00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc													X02SS0010006		X02SS0010024		X02SS0020006		X02SS0020024		X02SS0030006		X02SS0030024		X02SS0040006		X02SS0040024	
	sample_date													20100203		20100203		20100203		20100203		20100203		20100203		20100203		20100203	
	sacode													NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix													SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																												
	top_depth													0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep													0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit													FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix													SS		SS		SS		SS		SS		SS		SS		SS	
	z													001		003		005		007		009		011		013		015	
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	anlplant	c_001		c_003		c_005		c_007		c_009		c_011		c_013		c_015	
	Explosives (mg/kg)																												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	3.6	NA	NA	NA	NA	NA	NA	6	12	NC	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NC	NC	80	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	NA	NA	NA	NA	NA	NC	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.25	UL	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	**NITROBENZENE**	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UR	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																												
7429-90-5	ALUMINUM	19700	7700	7700	7800	NA	10	NC	NC	NC	NC	NC	NC	5120 [SSL]		6140 [SSL]		4670 [SSL]		8450 [PAL] [ORNL] [MDRES] [SSL]		4580 [SSL]		6850 [SSL]		7220 [SSL]		7110 [SSL]	
7440-36-0	ANTIMONY	NA	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	0.17	L	0.051	J	0.033	UL	0.032	UL	0.033	UL	0.038	J	0.10	L	0.072	J
7440-38-2	ARSENIC	14.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	1.2 [PAL] [ORNL] [MDRES] [MDSGW]		0.61 [PAL] [ORNL] [MDRES] [MDSGW]		1 [PAL] [ORNL] [MDRES] [MDSGW]		1.1 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	43.8	K	21.2	K	18.5	K	31.2	K	18.7	K	23.7	K	44.1	K	36.5	K
7440-41-7	BERYLLIUM	1.1	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	0.24	J	1.1		0.17	J	0.30	J	0.24	J	0.29	J	0.30	J	0.28	J
7440-43-9	CADMIUM	2.5	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	0.11	J	0.081	U	0.081	U	0.082	U	0.082	U	0.082	U	0.082	U	0.083	U
7440-70-2	CALCIUM	2060	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	175		243		62		70		105		73.9		354		245	
7440-47-3	**CHROMIUM**	33.4	26	12000	12000	200000000	26	NC	NC	NC	NC	NC	NC	5.5	K	9.8	K	6	K	10	K	10.1	K	12.6	K	10.2	K	10.4	K
7440-48-4	COBALT	22.3	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	2.9 [PAL] [ORNL]		2.3		2.2		3.7 [PAL] [ORNL]		3.8 [PAL] [ORNL]		4.8 [PAL] [ORNL]		3.1 [PAL] [ORNL]		2.7 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	12.6		22.1 [BKG]		2		3		3.1		3.7		12.7		7.4	
7439-89-6	IRON	38500	5500	5500	5500	NA	11	NC	NC	NC	NC	NC	NC	3460 [SSL]		5340 [SSL]		5080 [SSL]		8070 [PAL] [ORNL] [MDRES] [SSL]		10000 [PAL] [ORNL] [MDRES] [SSL]		12000 [PAL] [ORNL] [MDRES] [SSL]		6570 [PAL] [ORNL] [MDRES] [SSL]		6020 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	18.8 [PAL] [SSL]		14.4 [PAL] [SSL]		7.2		6.1		6.1		5.6		19.7 [PAL] [SSL]		14.1 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	3 [PAL] [OPLNT]		3.9 [PAL] [OPLNT]		3.3 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]		3.6 [PAL] [OPLNT]		4.9 [PAL] [OPLNT]		5.3 [PAL] [OPLNT]		4.9 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	295	K	265	K	244	K	424	K	274	K	332	K	546	K	473	K
7439-96-5	MANGANESE	1390	160	180	160	950	220	NC	NC	NC	NC	NC	NC	30.5		18.3		28.6		33.9		133		97.7		35.3		32.5	
7439-97-6	**MERCURY**	0.16	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	0.064 [PAL] [BTAG]		0.023		0.016	J	0.013	J	0.013	J	0.014	J	0.053		0.037	
7440-02-0	NICKEL	15.4	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	5		4.3		3.8		8.1		4.1		7.9		7.6		8.2	
7440-09-7	POTASSIUM	1470	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	535	K	424	K	354	K	590	K	464	K	518	K	582	K	552	K
7782-49-2	SELENIUM	1.2	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	0.41	L	0.15	L	0.11	L	0.12	L	0.083	J	0.10	L	0.43	L	0.42	L
7440-22-4	SILVER	0.84	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	0.083	U	0.081	U	0.081	U	0.082	U	0.082	U	0.082	U	0.082	U	0.083	U
7440-23-5	SODIUM	120	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	20.2	J	23.4	J	11.2	J	17.7	J	11.5	J	13	J	71.5		52.4	
7440-24-6	STRONTIUM	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	4.6	K	3.7	K	2.4	K	3.4	K	2.7	K	2.5	K	5.3	K	4.3	K
7440-31-5	**TIN**	NA	0.89	4700	4700	NA	NA	0.89	NC	NC	NC	NC	NC	0.83	U	0.81	U	0.81	U	0.82	U	0.83	U	0.82	U	0.82	U	0.83	U
7440-62-2	VANADIUM	53.3	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	13.7 [PAL] [MDRES] [SSL]	K	17.1 [PAL] [MDRES] [SSL]	K	9.6 [PAL] [MDRES] [SSL]	K	13.9 [PAL] [MDRES] [SSL]	K	12.2 [PAL] [MDRES] [SSL]	K	14.5 [PAL] [MDRES] [SSL]	K	18.1 [PAL] [MDRES] [SSL]	K	15.8 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	18		12.7		10.8		18.3		10.5		12.8		19		16.7	
	Miscellaneous Parameters																												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC																
TTNUS288	PERCENT MOISTURE (%)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC																
TTNUS002	PH (S.U.)	8.8	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC																
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC																
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC																

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss00500		x02ss00501		x02ss00503		x02ss00506		x02ss00600		x02ss00602		x02ss00700		x02ss00702		x02ss00800		x02ss00802	
	nsample			X02SS0050006		X02SS0050006-AVG		X02SS0050006-D		X02SS0050024		X02SS0060006		X02SS0060024		X02SS0070006		X02SS0070024		X02SS0080006		X02SS0080024	
	location			X02SB005		X02SB005		X02SB005		X02SB005		X02SB006		X02SB006		X02SB007		X02SB007		X02SB008		X02SB008	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0050006		X02SS0050006-AVG		FD020410-01		X02SS0050024		X02SS0060006		X02SS0060024		X02SS0070006		X02SS0070024		X02SS0080006		X02SS0080024	
	sample_date			20100204		20100204		20100204		20100204		20100203		20100203		20100203		20100203		20100203		20100203	
	sacode			ORG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate							x02SS0050006															
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		0.50		0.00		2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			017		018		020		023		025		027		029		031		033		035	
cas	x	utl95val	minorpal	c_017		c_018		c_020		c_023		c_025		c_027		c_029		c_031		c_033		c_035	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
2691-41-0	HMX	NA	380	0.2	UL	0.20	UL	0.2	UL	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
121-82-4	RDX	NA	5.5	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
479-45-8	TETRYL	NA	24	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	19700	7700	8910 [PAL] [ORNL] [MDRES] [SSL]		9025 [PAL] [ORNL] [MDRES] [SSL]		9140 [PAL] [ORNL] [MDRES] [SSL]		8020 [PAL] [ORNL] [MDRES] [SSL]		4910 [SSL]		8840 [PAL] [ORNL] [MDRES] [SSL]		7690 [SSL]		9060 [PAL] [ORNL] [MDRES] [SSL]		9830 [PAL] [ORNL] [MDRES] [SSL]		11900 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.058	J	0.0425	J	0.053	B	0.032	UL	0.053	J	0.032	UL	0.092	J	0.032	UL	0.054	J	0.033	
7440-38-2	ARSENIC	14.9	0.026	1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.55 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		0.77 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.4 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.4 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	45.8	K	45	K	44.2	K	54.1	K	20.4	K	35	K	32.2	K	33.6	K	44.7	K	44.4	
7440-41-7	BERYLLIUM	1.1	16	0.37	J	0.365	J	0.36	J	0.37	J	0.22	J	0.33	J	0.21	J	0.26	J	0.36	J	0.40	
7440-43-9	CADMIUM	2.5	0.36	0.081	U	0.082	U	0.083	U	0.082	U	0.082	U	0.08	U	0.081	U	0.081	U	0.083	U	0.082	
7440-70-2	CALCIUM	2060	NA	136		127.5		119		120		69.3		66		107		100		258		210	
7440-47-3	CHROMIUM	33.4	26	11.3	K	11.1	K	10.9	K	11.2	K	6.4	K	12.7	K	9.7	K	9.9	K	10.9	K	13.7	
7440-48-4	COBALT	22.3	2.3	5.7 [PAL] [ORNL]		5.35 [PAL] [ORNL]		5 [PAL] [ORNL]		5.3 [PAL] [ORNL]		7 [PAL] [ORNL]		5.6 [PAL] [ORNL]		2.2		2.1		3.2 [PAL] [ORNL]		3 [PAL] [ORNL]	
7440-50-8	COPPER	20.3	28	8.1		7.8		7.5		4.7		4.4		6.4		4.9		4.2		7.8		6	
7439-89-6	IRON	38500	5500	7680 [PAL] [ORNL] [MDRES] [SSL]		7600 [PAL] [ORNL] [MDRES] [SSL]		7520 [PAL] [ORNL] [MDRES] [SSL]		6720 [PAL] [ORNL] [MDRES] [SSL]		4690 [SSL]		8140 [PAL] [ORNL] [MDRES] [SSL]		7570 [PAL] [ORNL] [MDRES] [SSL]		7630 [PAL] [ORNL] [MDRES] [SSL]		9190 [PAL] [ORNL] [MDRES] [SSL]		11400 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	11	17.9 [PAL] [SSL]		17 [PAL] [SSL]		16.1 [PAL] [SSL]		9.8		19.5 [PAL] [SSL]		12.9 [PAL] [SSL]		16.1 [PAL] [SSL]		9.3		16.2 [PAL] [SSL]		10.4	
7439-93-2	LITHIUM	NA	2	7.1 [PAL] [OPLNT]		7 [PAL] [OPLNT]		6.9 [PAL] [OPLNT]		9 [PAL] [OPLNT]		6 [PAL] [OPLNT]		13.1 [PAL] [OPLNT]		4.6 [PAL] [OPLNT]		6.3 [PAL] [OPLNT]		6.9 [PAL] [OPLNT]		8.4 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620	4400	519	K	511	K	503	K	540	K	273	K	567	K	359	K	421	K	552	K	609	
7439-96-5	MANGANESE	1390	160	203 [PAL] [ORNL] [MDRES]		181.5 [PAL] [ORNL] [MDRES]		160		157		130		77.8		25.4		22.9		46.3		36.1	
7439-97-6	MERCURY	0.16	0.058	0.081 [PAL] [BTAG]		0.078 [PAL] [BTAG]		0.075 [PAL] [BTAG]		0.03		0.04		0.018	J	0.034		0.015	J	0.079 [PAL] [BTAG]		0.034	
7440-02-0	NICKEL	15.4	38	7.2		7.05		6.9		8		4.4		9.1		5.2		5.8		6.1		7	
7440-09-7	POTASSIUM	1470	NA	650	K	647.5	K	645	K	756	K	460	K	1020	K	474	K	632	K	764	K	971	
7782-49-2	SELENIUM	1.2	0.52	0.25	L	0.25	L	0.25	L	0.16	L	0.25		0.25	L	0.30	L	0.17	L	0.23	L	0.10	
7440-22-4	SILVER	0.84	4.2	0.081	U	0.082	U	0.083	U	0.082	U	0.082	U	0.08	U	0.081	U	0.081	U	0.083	U	0.082	
7440-23-5	SODIUM	120	NA	23.6	J	23.35	J	23.1	J	26.5	J	27.5	J	35.8	J	19.3	J	31	J	25.2	J	32.6	
7440-24-6	STRONTIUM	NA	120	3.9	K	4	K	4.1	K	4.3	K	2.8	K	4.7	K	3.1	K	3.8	K	5.2	K	5.7	
7440-31-5	TIN	NA	0.89	0.81	U	0.82	U	0.83	U	0.82	U	0.82	U	0.80	U	0.82	U	0.81	U	0.83	U	0.82	
7440-62-2	VANADIUM	53.3	7.8	18.9 [PAL] [MDRES] [SSL]	K	18.55 [PAL] [MDRES] [SSL]	K	18.2 [PAL] [MDRES] [SSL]	K	17.4 [PAL] [MDRES] [SSL]	K	14.6 [PAL] [MDRES] [SSL]	K	19.4 [PAL] [MDRES] [SSL]	K	17.1 [PAL] [MDRES] [SSL]	K	17.2 [PAL] [MDRES] [SSL]	K	20.7 [PAL] [MDRES] [SSL]	K	22.9 [PAL] [MDRES] [SSL]	
7440-66-6	ZINC	37.5	46	23.2		22.6		22		22.7		14.7		22.7		13.9		13.4		36.6		28.2	
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U.)	8.8	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																				
TTNUS046	TOTAL SOLIDS (%)	79.2	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter				x02ss00900		x02ss00902		x02ss01000		x02ss01002		x02ss01100		x02ss01102		x02ss01200		x02ss01202		x02ss01300		x02ss01302	
	nsample				X02SS0090006		X02SS0090024		X02SS0100006		X02SS0100024		X02SS0110006		X02SS0110024		X02SS0120006		X02SS0120024		X02SS0130006		X02SS0130024	
	location				X02SB009		X02SB009		X02SB010		X02SB010		X02SB011		X02SB011		X02SB012		X02SB012		X02SB013		X02SB013	
	project_no				00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc				X02SS0090006		X02SS0090024		X02SS0100006		X02SS0100024		X02SS0110006		X02SS0110024		X02SS0120006		X02SS0120024		X02SS0130006		X02SS0130024	
	sample_date				20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204	
	sacode				NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix				SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																							
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00
	depth_unit				FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix				SS		SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z				037		039		041		043		045		047		049		051		053		055	
cas	x	utl95val	minorpal		c_027		c_039		c_041		c_043		c_045		c_047		c_049		c_051		c_053		c_055	
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	NA	9	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.67	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	**NITROBENZENE**	NA	0.023	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																							
7429-90-5	ALUMINUM	19700	7700		13900 [PAL] [ORNL] [MDRES] [SSL]	J	17400 [PAL] [ORNL] [MDRES] [SSL]	J	9290 [PAL] [ORNL] [MDRES] [SSL]	J	15900 [PAL] [ORNL] [MDRES] [SSL]	J	12500 [PAL] [ORNL] [MDRES] [SSL]	J	10900 [PAL] [ORNL] [MDRES] [SSL]	J	9480 [PAL] [ORNL] [MDRES] [SSL]	J	8330 [PAL] [ORNL] [MDRES] [SSL]	J	11500 [PAL] [ORNL] [MDRES] [SSL]	J	11500 [PAL] [ORNL] [MDRES] [SSL]	J
7440-36-0	ANTIMONY	NA	0.27	UL	0.054	J	0.034	J	0.041	J	0.075	J	0.036	J	0.032	UL	0.058	J	0.033	UL	0.056	J	0.046	J
7440-38-2	ARSENIC	14.9	0.026		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.3 [PAL] [ORNL] [MDRES] [MDSGW]		1.1 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	K	95.8 [BKG]	K	55.9	K	19.8	K	53.7	K	42	K	18.8	K	24.6	K	28.4	K	17	K	28.3	K
7440-41-7	BERYLLIUM	1.1	16	J	0.99		0.57		0.16	U	0.33	J	0.32	J	0.17	J	0.18	J	0.21	J	0.16	U	0.23	J
7440-43-9	CADMIUM	2.5	0.36	U	0.081	UL	0.08	UL	0.082	U	0.16	UL	0.082	U	0.081	U	0.081	UL	0.083	UL	0.082	U	0.082	U
7440-70-2	CALCIUM	2060	NA		380	K	189	K	57.6	K	172	K	158	K	67.7	K	84.4	K	98.1	K	113	K	139	K
7440-47-3	**CHROMIUM**	33.4	26	K	18.9	K	10.7	K	4.4	K	**1570 [BKG] [PAL] [SSL]**	K	8.1	K	4.3	K	11.6	K	12	K	7.7	K	8.4	K
7440-48-4	COBALT	22.3	2.3		12.8 [PAL] [ORNL]		6.7 [PAL] [ORNL]		1.3		8.4 [PAL] [ORNL]		2.4 [PAL] [ORNL]		1.1		1.6		1.8		1.3		1.8	
7440-50-8	**COPPER**	20.3	28		10.7		4.7		12.9		13.1		3.8		1.5		5		4.2		3.6		3.3	
7439-89-6	IRON	38500	5500		15100 [PAL] [ORNL] [MDRES] [SSL]		8310 [PAL] [ORNL] [MDRES] [SSL]		3590 [SSL]		15900 [PAL] [ORNL] [MDRES] [SSL]		4270 [SSL]		2460 [SSL]		7440 [PAL] [ORNL] [MDRES] [SSL]		6570 [PAL] [ORNL] [MDRES] [SSL]		5000 [SSL]		4700 [SSL]	
7439-92-1	**LEAD**	62.5	11		**72.1 [BKG] [PAL] [SSL]**		20.2 [PAL] [SSL]		9.9		9.2		14.3 [PAL] [SSL]		4.9		14.6 [PAL] [SSL]		9.4		14.4 [PAL] [SSL]		13.1 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2		12.8 [PAL] [OPLNT]		6.4 [PAL] [OPLNT]		2.6 [PAL] [OPLNT]		6.2 [PAL] [OPLNT]		5.8 [PAL] [OPLNT]		3 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]		6.2 [PAL] [OPLNT]		3.1 [PAL] [OPLNT]		4 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	K	1120	K	635	K	191	K	445	K	490	K	218	K	430	K	439	K	282	K	365	K
7439-96-5	MANGANESE	1390	160		567 [PAL] [ORNL] [MDRES] [SSL]	K	258 [PAL] [ORNL] [MDRES] [SSL]	K	27.2	K	138	K	28.3	K	14.2	K	27	K	26.4	K	21.4	K	24.9	K
7439-97-6	**MERCURY**	0.16	0.058		0.028		0.025		0.068 [PAL] [BTAG]		0.028		0.033		0.014	J	0.043		0.028		0.03		0.021	
7440-02-0	NICKEL	15.4	38		15.6 [BKG]		9.3		2.8		18.1 [BKG]		5.1		2.4		5.3		5.9		4.3		5.3	
7440-09-7	POTASSIUM	1470	NA	K	1060	K	619	K	242	K	1330	K	639	K	340	K	569	K	639	K	354	K	480	K
7782-49-2	SELENIUM	1.2	0.52	L	0.077	J	0.15	L	0.18	L	0.11	L	0.24	L	0.13	L	0.22	L	0.099	L	0.091	J	0.18	L
7440-22-4	SILVER	0.84	4.2	U	0.12	J	0.08	U	0.082	U	0.16	U	0.082	U	0.081	U	0.081	U	0.083	U	0.082	U	0.082	U
7440-23-5	SODIUM	120	NA	J	34.1	K	18.7	J	8.2	U	87.1	K	26.3	K	11.4	J	17.4	J	18.9	J	15.2	J	19.6	J
7440-24-6	STRONTIUM	NA	120	K	7.2	K	4.4	K	1.9	K	6.4	K	4.7	K	2.5	K	2.9	K	3.1	K	2.3	K	3.4	K
7440-31-5	TIN	NA	0.89	U	0.81 [PAL] [BTAG]	J	0.86	U	0.82	U	1.6	U	0.82	U	0.81	U	0.81	U	0.83	U	0.82	U	0.82	U
7440-62-2	VANADIUM	53.3	7.8	K	34.3 [PAL] [MDRES] [SSL]	K	17.6 [PAL] [MDRES] [SSL]	K	9.3 [PAL] [MDRES] [SSL]	K	22.5 [PAL] [MDRES] [SSL]	K	16.6 [PAL] [MDRES] [SSL]	K	8.1 [PAL] [MDRES] [SSL]	K	20.1 [PAL] [MDRES] [SSL]	K	17.5 [PAL] [MDRES] [SSL]	K	13.1 [PAL] [MDRES] [SSL]	K	13.4 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46		**52.7 [BKG] [PAL] [SSL]**		25.1		8.2		12.9	K	13.4		5.9		13.8		14.5		10.2		12	
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																					
TTNUS288	PERCENT MOISTURE (%)	NA	NA																					
TTNUS002	PH (S.U.)	8.8	NA																					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																					
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																					

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA B (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss01400		x02ss01402		x02ss01500		x02ss01502		x02ss01600		x02ss01602		x02ss01700		x02ss01702		x02ss01800		x02ss01802	
	nsample			X02SS0140006		X02SS0140024		X02SS0150006		X02SS0150024		X02SS0160006		X02SS0160024		X02SS0170006		X02SS0170024		X02SS0180006		X02SS0180024	
	location			X02SB014		X02SB014		X02SB015		X02SB015		X02SB016		X02SB016		X02SB017		X02SB017		X02SB018		X02SB018	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0140006		X02SS0140024		X02SS0150006		X02SS0150024		X02SS0160006		X02SS0160024		X02SS0170006		X02SS0170024		X02SS0180006		X02SS0180024	
	sample_date			20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																						
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			057		059		061		063		065		067		069		071		073		075	
cas	x	utl95val	minorpal	c_057		c_059		c_061		c_063		c_065		c_067		c_069		c_071		c_073		c_075	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UL	0.2	U	0.19	U	0.19	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UL	0.2	U	0.19	U	0.19	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	UR	0.25	U	0.24	U	0.24	U	0.24	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U	0.19	UJ	0.2	UJ
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	UL	0.25	U	0.24	U	0.24	U	0.24	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UL	0.2	U	0.19	U	0.19	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.19	U	0.19	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.1	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.1	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UL	0.2	U	0.19	U	0.19	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UR	0.2	U	0.19	UR	0.19	U	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	19700	7700	11100 [PAL] [ORNL] [MDRES] [SSL]	J	12200 [PAL] [ORNL] [MDRES] [SSL]	J	13000 [PAL] [ORNL] [MDRES] [SSL]	J	19300 [PAL] [ORNL] [MDRES] [SSL]	J	12800 [PAL] [ORNL] [MDRES] [SSL]	J	6690 [SSL]		8390 [PAL] [ORNL] [MDRES] [SSL]		7320 [SSL]		4050 [SSL]		6940 [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.036	J	0.032	UL	0.034	J	0.033	UL	0.035	J	0.032	UL	0.051	J	0.033	J	0.033	UL	0.032	UL
7440-38-2	ARSENIC	14.9	0.026	1.7 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	80.4	330	52.3	K	56.1	K	40.4	K	36.7	K	39.8	K	52.9	K	44.7	K	50.4		29.7	K	33.2	K
7440-41-7	BERYLLIUM	1.1	16	0.54		0.55		0.47	J	0.39	J	0.38	J	0.50		0.47	J	0.47	J	0.23	J	0.28	J
7440-43-9	CADMIUM	2.5	0.36	0.079	UL	0.08	UL	0.081	UL	0.081	UL	0.081	UL	0.082	UL	0.083	UL	0.083	U	0.083	UL	0.083	UL
7440-70-2	CALCIUM	2060	NA	213	K	177	K	148	K	106	K	115	K	134	K	148	K	133		20300 [BKG]	K	6930 [BKG]	K
7440-47-3	CHROMIUM	33.4	26	12.6	K	14.4	K	9.7	K	7.2	K	10.2	K	12.5	K	10.5	K	9.5		7.2	K	9.7	K
7440-48-4	COBALT	22.3	2.3	8.7 [PAL] [ORNL]		10.3 [PAL] [ORNL]		7.4 [PAL] [ORNL]		5.7 [PAL] [ORNL]		3.7 [PAL] [ORNL]		4.6 [PAL] [ORNL]		5.2 [PAL] [ORNL]		4.7 [PAL] [ORNL]		3 [PAL] [ORNL]		2.8 [PAL] [ORNL]	
7440-50-8	COPPER	20.3	28	4.5		4.5		3.6		2.3		4.3		4.5		4.6		3.7		3.2		3.3	
7439-89-6	IRON	38500	5500	9540 [PAL] [ORNL] [MDRES] [SSL]		11300 [PAL] [ORNL] [MDRES] [SSL]		7220 [PAL] [ORNL] [MDRES] [SSL]		5600 [PAL] [ORNL] [MDRES] [SSL]		7750 [PAL] [ORNL] [MDRES] [SSL]		9130 [PAL] [ORNL] [MDRES] [SSL]		8560 [PAL] [ORNL] [MDRES] [SSL]		7530 [PAL] [ORNL] [MDRES] [SSL]		5520 [PAL] [ORNL] [MDRES] [SSL]		7220 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	11	14.3 [PAL] [SSL]		11.7 [PAL] [SSL]		13.5 [PAL] [SSL]		5.5		12.5 [PAL] [SSL]		9.1		29.9 [PAL] [SSL]		12.1 [PAL] [SSL]		13.7 [PAL] [SSL]		8	
7439-93-2	LITHIUM	NA	2	6.9 [PAL] [OPLNT]		8.1 [PAL] [OPLNT]		4.7 [PAL] [OPLNT]		4.1 [PAL] [OPLNT]		4.9 [PAL] [OPLNT]		6 [PAL] [OPLNT]		5.6 [PAL] [OPLNT]		5.5 [PAL] [OPLNT]		3.7 [PAL] [OPLNT]		5.4 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620	4400	680	K	782	K	477	K	433	K	455	K	532	K	527	K	509		11700 [BKG] [PAL] [BTAG]	K	4320 [BKG]	K
7439-96-5	MANGANESE	1390	160	245 [PAL] [ORNL] [MDRES] [SSL]	K	197 [PAL] [ORNL] [MDRES]	K	243 [PAL] [ORNL] [MDRES] [SSL]	K	159	K	130	K	180 [PAL] [MDRES]		175 [PAL] [MDRES]		187 [PAL] [ORNL] [MDRES]		204 [PAL] [ORNL] [MDRES]		106	
7439-97-6	MERCURY	0.16	0.058	0.03		0.02		0.022		0.017	J	0.029		0.011	J	0.025	L	0.016	J	0.023	L	0.012	J
7440-02-0	NICKEL	15.4	38	8.3		9.4		7.5		6.2		6		7.6		6.9		8		4.7		5.8	
7440-09-7	POTASSIUM	1470	NA	724	K	855	K	472	K	417	K	522	K	690	K	558	K	590	K	496	K	645	K
7782-49-2	SELENIUM	1.2	0.52	0.097	J	0.099	L	0.14	L	0.14	L	0.17	L	0.14	J	0.17	J	0.22	L	0.11	J	0.034	J
7440-22-4	SILVER	0.84	4.2	0.079	U	0.08	U	0.081	U	0.081	U	0.081	U	0.082	U	0.083	U	0.083	U	0.083	U	0.083	U
7440-23-5	SODIUM	120	NA	22.4	J	25	K	14.2	J	10.7	J	15	J	17.9	J	12.6	J	19.8	J	25.4		19.4	J
7440-24-6	STRONTIUM	NA	120	5	K	5.1	K	3.7	K	3	K	3.5	K	4.1	K	3.8	K	4		10	K	6.4	K
7440-31-5	TIN	NA	0.89	0.80	U	0.80	U	0.81	U	0.81	U	0.82	U	0.82	U	0.83	U	0.83	U	0.83	U	0.83	U
7440-62-2	VANADIUM	53.3	7.8	20.8 [PAL] [MDRES] [SSL]	K	22.5 [PAL] [MDRES] [SSL]	K	16.7 [PAL] [MDRES] [SSL]	K	11.7 [PAL] [MDRES] [SSL]	K	16.5 [PAL] [MDRES] [SSL]	K	17.4 [PAL] [MDRES] [SSL]	K	17.9 [PAL] [MDRES] [SSL]	K	15.3 [PAL] [MDRES] [SSL]		12.2 [PAL] [MDRES] [SSL]	K	14.7 [PAL] [MDRES] [SSL]	K
7440-66-6	ZINC	37.5	46	22.3		23.1		19.2		13.4		16.1		19.2		20.7		18.9		16.1		15.3	
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U.)	8.8	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																				
TTNUS046	TOTAL SOLIDS (%)	79.2	NA																				

mg/kg = milligram per kilogram
meq/100 = milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA B (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss01900		x02ss01902		x02ss02000		x02ss02002		x02ss02100		x02ss02102		x02ss02200		x02ss02202		x02ss02300		x02ss02302	
	nsample			X02SS0190006		X02SS0190024		X02SS0200006		X02SS0200024		X02SS0210006		X02SS0210024		X02SS0220006		X02SS0220024		X02SS0230006		X02SS0230024	
	location			X02SB019		X02SB019		X02SB020		X02SB020		X02SB021		X02SB021		X02SB022		X02SB022		X02SB023		X02SB023	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0190006		X02SS0190024		X02SS0200006		X02SS0200024		X02SS0210006		X02SS0210024		X02SS0220006		X02SS0220024		X02SS0230006		X02SS0230024	
	sample_date			20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																						
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			077		079		081		083		085		087		089		091		093		095	
cas	x	utl95val	minorpal	c_077		c_079		c_081		c_083		c_085		c_087		c_089		c_091		c_093		c_095	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	UJ	0.2	U	0.2	UJ	0.2	U	0.19	U	0.2	U	0.2	
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.24	UL	0.25	UL	0.25	
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	K	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	
2691-41-0	HMX	NA	380	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	
98-95-3	**NITROBENZENE**	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
121-82-4	RDX	NA	5.5	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	19700	7700	6910 [SSL]		5950 [SSL]		3830 [SSL]		3110 [SSL]		7830 [PAL] [ORNL] [MDRES] [SSL]		14700 [PAL] [ORNL] [MDRES] [SSL]		7030 [SSL]		7860 [PAL] [ORNL] [MDRES] [SSL]		8980 [PAL] [ORNL] [MDRES] [SSL]		8270 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.055	J	0.033	UL	0.032	UL	0.032	UL	0.099	L	0.052	J	0.054	J	0.036	J	0.045	J	0.032	
7440-38-2	ARSENIC	14.9	0.026	1.3 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.1 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.80 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.53 [PAL] [ORNL] [MDRES] [MDSGW]	J	4.5 [PAL] [ORNL] [MDRES] [MDSGW]	J	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.5 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	39	K	41.4	K	18.7	K	14.4	K	27.8	K	39.9	K	32.4	K	52.8	K	47.1	K	53.5	
7440-41-7	BERYLLIUM	1.1	16	0.30	U	0.33	J	0.17	U	0.16	U	0.26	J	0.37	J	0.31	J	0.42	J	0.40	J	0.49	
7440-43-9	CADMIUM	2.5	0.36	0.083	U	0.081	U	0.083	U	0.082	U	0.082	UL	0.081	UL	0.082	UL	0.082	UL	0.081	UL	0.082	
7440-70-2	CALCIUM	2060	NA	120	K	202	K	102	K	67.3	K	157	K	143	K	158	K	132	K	448	K	220	
7440-47-3	**CHROMIUM**	33.4	26	9.3	K	9.9	K	4.7	K	4	K	11.7	K	14.9	K	11.9	K	14.1	K	11.5	K	12.2	
7440-48-4	COBALT	22.3	2.3	3 [PAL] [ORNL]		3.1 [PAL] [ORNL]		1.1		0.79		2.2		3.4 [PAL] [ORNL]		3.2 [PAL] [ORNL]		4.1 [PAL] [ORNL]		5.9 [PAL] [ORNL]		7.6 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	**65.5 [BKG] [PAL] [SSL]**		**77.4 [BKG] [PAL] [SSL]**		10.7		7.9		4.9		5.7		6.4		6		5		4.1	
7439-89-6	IRON	38500	5500	4000 [SSL]		4550 [SSL]		3530 [SSL]		2380 [SSL]		9290 [PAL] [ORNL] [MDRES] [SSL]		12000 [PAL] [ORNL] [MDRES] [SSL]		9430 [PAL] [ORNL] [MDRES] [SSL]		12200 [PAL] [ORNL] [MDRES] [SSL]		9230 [PAL] [ORNL] [MDRES] [SSL]		9100 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	21.5 [PAL] [SSL]		22.8 [PAL] [SSL]		11		7.3		15.7 [PAL] [SSL]		15.3 [PAL] [SSL]		18 [PAL] [SSL]		11.5 [PAL] [SSL]		13.1 [PAL] [SSL]		10.2	
7439-93-2	**LITHIUM**	NA	2	5.9 [PAL] [OPLNT]		6.2 [PAL] [OPLNT]		3.2 [PAL] [OPLNT]		2.7 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]		8.9 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]		8.5 [PAL] [OPLNT]		6.6 [PAL] [OPLNT]		7.1 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	414	K	451	K	262	K	190	K	530	K	776	K	564	K	816	K	633	K	695	
7439-96-5	MANGANESE	1390	160	26.7		28.3		24.7		20.2		51.1		51.8		70.7		76.8		198 [PAL] [ORNL] [MDRES]		150	
7439-97-6	**MERCURY**	0.16	0.058	**0.32 [BKG] [PAL] [BTAG]**	L	**0.18 [BKG] [PAL] [BTAG]**	L	0.042	L	0.023	L	0.023	L	0.018	J	0.027	L	0.01	J	0.027	L	0.013	
7440-02-0	NICKEL	15.4	38	8		8.1		3.5		2.7		6.6		8		6.8		8.5		7.5		9.4	
7440-09-7	POTASSIUM	1470	NA	544	K	607	K	393	K	296	K	704	K	1010	K	699	K	812	K	757	K	770	
7782-49-2	SELENIUM	1.2	0.52	0.20	J	0.12	J	0.11	J	0.13	J	0.032	UJ	0.032	UJ	0.056	J	0.032	UJ	0.05	J	0.032	
7440-22-4	SILVER	0.84	4.2	0.083	U	0.081	U	0.083	U	0.082	U	0.082	U	0.081	U	0.082	U	0.082	U	0.081	U	0.082	
7440-23-5	SODIUM	120	NA	16.5	J	15.2	J	9.6	J	8.2	U	18	J	24.5		12.8	J	12.3	J	13.7	J	16.3	
7440-24-6	STRONTIUM	NA	120	3.7	K	4.3	K	2.5	K	2.1	K	3.9	K	4.7	K	4.5	K	4.6	K	5.6	K	4.8	
7440-31-5	TIN	NA	0.89	0.83	U	0.82	U	0.83	U	0.82	U	0.82	U	0.82	U	0.82	U	0.83	U	0.81	U	0.82	
7440-62-2	VANADIUM	53.3	7.8	15.3 [PAL] [MDRES] [SSL]	K	16.8 [PAL] [MDRES] [SSL]	K	11.5 [PAL] [MDRES] [SSL]	K	8.5 [PAL] [MDRES] [SSL]	K	20.5 [PAL] [MDRES] [SSL]	K	24.4 [PAL] [MDRES] [SSL]	K	21.2 [PAL] [MDRES] [SSL]	K	23.2 [PAL] [MDRES] [SSL]	K	20.4 [PAL] [MDRES] [SSL]	K	18.6 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	17.5		18.4		10.2	K	7.4		16.8		20.9		19.2		24.4		21.2		21.5	
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U.)	8.8	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																				
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss02400		x02ss02402		x02ss02403		x02ss02405		x02ss02500		x02ss02502		x02ss02600		x02ss02601		x02ss02603	
	nsample			X02SS0240006		X02SS0240024		X02SS0240024-AVG		X02SS0240024-D		X02SS0250006		X02SS0250024		X02SS0260006		X02SS0260006-AVG		X02SS0260006-D	
	location			X02SB024		X02SB024		X02SB024		X02SB024		X02SB025		X02SB025		X02SB026		X02SB026		X02SB026	
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010052		00810_2010052		00810_2010052	
	sample_coc			X02SS0240006		X02SS0240024		X02SS0240024-AVG		FD020410-02		X02SS0250006		X02SS0250024		X02SS0260006		X02SS0260006-AVG		FD031010-03	
	sample_date			20100204		20100204		20100204		20100204		20100204		20100204		20100310		20100310		20100310	
	sacode			NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL		ORIG		AVG		DUP	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate									X02SS0240024										X02SS0260006	
	top_depth			0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	bottom_dep			0.00	0.50		2.00	2.00		2.00	2.00		0.50		2.00		0.50	0.50			0.50
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			097		099		100		102		105		107		109		110		112	
cas	x	utl95val	minorpal	c_097		c_099		c_100		c_102		c_105		c_107		c_109		c_110		c_112	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	UL	0.2	UL	0.195	UL	0.19	U	0.2	UL	0.2	UL	0.2	U	0.20	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	UL	0.2	UL	0.195	UL	0.19	U	0.2	UL	0.2	UL	0.2	U	0.20	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.245	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	UL	0.25	UL	0.245	UL	0.24	U	0.24	UL	0.25	UL	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.195	UL	0.19	U	0.2	UL	0.2	UL	0.2	U	0.20	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.15	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.15	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	UL	0.2	UL	0.195	UL	0.19	U	0.2	UL	0.2	UL	0.2	U	0.20	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	3740 [SSL]		4190 [SSL]		4170 [SSL]		4150 [SSL]		2570 [SSL]		2270 [SSL]		12700 [PAL] [ORNL] [MDRES] [SSL]		11145 [PAL] [ORNL] [MDRES] [SSL]		9590 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.039	UL	0.039	J	0.032	UL	0.0325	UL	0.033	UL	0.032	UL	0.058	J	0.098	UJ	0.056	J	0.056	J
7440-38-2	ARSENIC	14.9	0.026	1.5 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.25 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.4 [PAL] [ORNL] [MDRES] [MDSGW]		2.25 [PAL] [ORNL] [MDRES] [MDSGW]		2.1 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	330	27.8	K	32.9	K	32.45	K	32		14.3	K	12.2	K	71.6		59.8		48	
7440-41-7	BERYLLIUM	1.1	16	0.28	J	0.36	J	0.35	J	0.34	J	0.16	U	0.17	U	0.65		0.56	J	0.46	J
7440-43-9	CADMIUM	2.5	0.36	0.081	UL	0.082	UL	0.0825	UL	0.083	U	0.082	UL	0.083	UL	0.082000	U	0.0815	U	0.081000	U
7440-70-2	CALCIUM	2060	NA	100	K	81.3	K	81.15	K	81		88.6	K	90.9	K	564	J	386	J	208	J
7440-47-3	CHROMIUM	33.4	26	7.3	K	7.3	K	7.2	K	7.1		7.7	K	6.7	K	12.7		12.4		12.1	
7440-48-4	COBALT	22.3	2.3	3.1 [PAL] [ORNL]		4.7 [PAL] [ORNL]		4.5 [PAL] [ORNL]		4.3 [PAL] [ORNL]		1.9		1.5		6.1 [PAL] [ORNL]		5.4 [PAL] [ORNL]		4.7 [PAL] [ORNL]	
7440-50-8	COPPER	20.3	28	12.8		3.6		4.05		4.5		10.8		11.6		17.5	J	11.25	J	5	J
7439-89-6	IRON	38500	5500	6840 [PAL] [ORNL] [MDRES] [SSL]		7090 [PAL] [ORNL] [MDRES] [SSL]		6880 [PAL] [ORNL] [MDRES] [SSL]		6670 [PAL] [ORNL] [MDRES] [SSL]		7430 [PAL] [ORNL] [MDRES] [SSL]		6430 [PAL] [ORNL] [MDRES] [SSL]		9520 [PAL] [ORNL] [MDRES] [SSL]		9910 [PAL] [ORNL] [MDRES] [SSL]		10300 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	11	10.9		5.7		5.8		5.9		7.3		10.6		19.2 [PAL] [SSL]		24.35 [PAL] [SSL]		29.5 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	2	3.5 [PAL] [OPLNT]		3.6 [PAL] [OPLNT]		3.65 [PAL] [OPLNT]		3.7 [PAL] [OPLNT]		1.7		1.4		7.2 [PAL] [OPLNT]		6.85 [PAL] [OPLNT]		6.5 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620	4400	271	K	283	K	286.5	K	290		194	K	180	K	783		678		573	
7439-96-5	MANGANESE	1390	160	49.3		62.6		58.15		53.7		50.5		46.6		354 [PAL] [ORNL] [MDRES] [SSL]	J	276.5 [PAL] [ORNL] [MDRES] [SSL]	J	199 [PAL] [ORNL] [MDRES]	J
7439-97-6	MERCURY	0.16	0.058	0.022	J	0.011	L	0.013	J	0.015	J	0.017	J	0.038	L	0.059 [PAL] [BTAG]	K	0.0475	J	0.036	J
7440-02-0	NICKEL	15.4	38	5.2		6.3		6.4		6.5		4.5		3.2		11		9.75		8.5	
7440-09-7	POTASSIUM	1470	NA	326	K	300	K	304.5	K	309	K	227	K	320	K	677	K	672.5	K	668	K
7782-49-2	SELENIUM	1.2	0.52	0.19	UJ	0.079	J	0.0605	J	0.042	J	0.13	J	0.12	J	0.032000	U	0.032	U	0.032000	U
7440-22-4	SILVER	0.84	4.2	0.081	U	0.082	U	0.0825	U	0.083	U	0.082	U	0.083	U	0.082000	U	0.0815	U	0.081000	U
7440-23-5	SODIUM	120	NA	8.1	U	8.2	U	8.3	J	8.5	J	8.2	U	8.3	U	24.9		19.95	J	15	J
7440-24-6	STRONTIUM	NA	120	2.8	K	2.6	K	2.75	K	2.9		3.3	K	2.8	K	6.7	K	5.7	K	4.7	K
7440-31-5	TIN	NA	0.89	0.81	U	0.82	U	0.825	U	0.83	U	0.82	U	0.83	U	0.820000	U	0.815	U	0.810000	U
7440-62-2	VANADIUM	53.3	7.8	13.7 [PAL] [MDRES] [SSL]	K	10.5 [PAL] [MDRES] [SSL]	K	10.4 [PAL] [MDRES] [SSL]	K	10.3 [PAL] [MDRES] [SSL]		12.7 [PAL] [MDRES] [SSL]	K	16.7 [PAL] [MDRES] [SSL]	K	21.8 [PAL] [MDRES] [SSL]		21.75 [PAL] [MDRES] [SSL]		21.7 [PAL] [MDRES] [SSL]	
7440-66-6	ZINC	37.5	46	13.3		14.1		13.85		13.6		9.2		9.6		32.8		27.65		22.5	
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA																		
TTNUS002	PH (S.U.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	TOTAL SOLIDS (%)	79.2	NA																		

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA B (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss02606		x02ss02700		x02ss02702		x02ss02800		x02ss02802		x02ss02900		x02ss02902		x02ss03000		x02ss03002		x02ss03100	
	nsample			X02SS0260024		X02SS0270006		X02SS0270024		X02SS0280006		X02SS0280024		X02SS0290006		X02SS0290024		X02SS0300006		X02SS0300024		X02SS0310006	
	location			X02SB026		X02SB027		X02SB027		X02SB028		X02SB028		X02SB029		X02SB029		X02SB030		X02SB030		X02SB031	
	project_no			00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010042	
	sample_coc			X02SS0260024		X02SS0270006		X02SS0270024		X02SS0280006		X02SS0280024		X02SS0290006		X02SS0290024		X02SS0300006		X02SS0300024		X02SS0310006	
	sample_date			20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																						
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			115		117		119		121		123		125		127		129		131		133	
cas	x	utl95val	minorpal	c_115		c_117		c_119		c_121		c_123		c_125		c_127		c_129		c_131		c_133	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.05	J	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	UL
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.05 [PAL] [MDSGW]	J	0.2	U
55-63-0	NITROGLYCERIN	NA	1.2	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UL	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	19700	7700	13900 [PAL] [ORNL] [MDRES] [SSL]		9230 [PAL] [ORNL] [MDRES] [SSL]		9950 [PAL] [ORNL] [MDRES] [SSL]		8530 [PAL] [ORNL] [MDRES] [SSL]		8040 [PAL] [ORNL] [MDRES] [SSL]		6410 [SSL]		6110 [SSL]		9440 [PAL] [ORNL] [MDRES] [SSL]		6820 [SSL]		5890 [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.099	UJ	0.1	UJ	0.099	UJ	0.1	UJ	0.099	UJ	0.098	UJ	0.062	J	0.058	J	0.045	J	0.05	J
7440-38-2	ARSENIC	14.9	0.026	2 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.5 [PAL] [ORNL] [MDRES] [MDSGW]		2.1 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		2.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.2 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	80.4	330	55.1		51.9		49.9		43		38.2		21		23.1		39.9		31.1		37.2	K
7440-41-7	BERYLLIUM	1.1	16	0.53		0.5	J	0.47	J	0.34	J	0.37	J	0.21	J	0.23	J	0.25	J	0.22	J	0.38	J
7440-43-9	CADMIUM	2.5	0.36	0.082000	U	0.081000	U	0.080000	U	0.082000	U	0.083000	U	0.082000	U	0.083000	U	0.082000	U	0.082000	U	0.082	UL
7440-70-2	CALCIUM	2060	NA	298	J	495	J	234	J	381	J	209	J	96.2	J	83.5	J	2240 [BKG]	J	1230	J	130	K
7440-47-3	CHROMIUM	33.4	26	12.5		8.9		8.8		9		7.8		8.7		8.4		20.6		13.5		9.7	K
7440-48-4	COBALT	22.3	2.3	5.7 [PAL] [ORNL]		4.8 [PAL] [ORNL]		4.8 [PAL] [ORNL]		5.4 [PAL] [ORNL]		4.8 [PAL] [ORNL]		1.8		1.9		3.9 [PAL] [ORNL]		2.5 [PAL] [ORNL]		3.3 [PAL] [ORNL]	
7440-50-8	COPPER	20.3	28	7.1	J	4.1	J	3.8	J	3.4	J	3.2	J	7.4	J	5.8	J	12.3	J	9.3	J	6.4	
7439-89-6	IRON	38500	5500	8410 [PAL] [ORNL] [MDRES] [SSL]		6950 [PAL] [ORNL] [MDRES] [SSL]		6510 [PAL] [ORNL] [MDRES] [SSL]		6960 [PAL] [ORNL] [MDRES] [SSL]		5680 [PAL] [ORNL] [MDRES] [SSL]		6910 [PAL] [ORNL] [MDRES] [SSL]		6640 [PAL] [ORNL] [MDRES] [SSL]		9690 [PAL] [ORNL] [MDRES] [SSL]		7810 [PAL] [ORNL] [MDRES] [SSL]		9890 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	11	10.8		15.1 [PAL] [SSL]		9		13.7 [PAL] [SSL]		8.1		24.2 [PAL] [SSL]		20.2 [PAL] [SSL]		41 [PAL] [SSL]		38.5 [PAL] [SSL]		16.3 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	2	7.3 [PAL] [OPLNT]		4.7 [PAL] [OPLNT]		4.9 [PAL] [OPLNT]		4.1 [PAL] [OPLNT]		3.7 [PAL] [OPLNT]		3.7 [PAL] [OPLNT]		3.8 [PAL] [OPLNT]		5 [PAL] [OPLNT]		4.5 [PAL] [OPLNT]		5.5 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620	4400	694		474		496		408		376		339		354		2260 [BKG]		1150		426	K
7439-96-5	MANGANESE	1390	160	190 [PAL] [ORNL] [MDRES]	J	403 [PAL] [ORNL] [MDRES] [SSL]	J	203 [PAL] [ORNL] [MDRES]	J	225 [PAL] [ORNL] [MDRES] [SSL]	J	154	J	34.8	J	30.7	J	371 [PAL] [ORNL] [MDRES] [SSL]	J	215 [PAL] [ORNL] [MDRES]	J	45.7	
7439-97-6	MERCURY	0.16	0.058	0.026	J	0.051	K	0.023	K	0.034	K	0.022	K	0.039	K	0.03	L	0.051	K	0.034	L	0.027	L
7440-02-0	NICKEL	15.4	38	9.1		7.2		6.8		6		6.5		5.1		6		21.8 [BKG]		12.5		7.1	
7440-09-7	POTASSIUM	1470	NA	614	K	439	K	458	K	366	K	337	K	397	K	393	K	527	K	422	K	720	K
7782-49-2	SELENIUM	1.2	0.52	0.033000	U	0.044	J	0.033000	U	0.033000	U	0.033000	U	0.032000	U	0.041	J	0.062	J	0.032000	U	0.14	J
7440-22-4	SILVER	0.84	4.2	0.082000	U	0.081000	U	0.080000	U	0.082000	U	0.083000	U	0.082000	U	0.083000	U	0.082000	U	0.082000	U	0.082	U
7440-23-5	SODIUM	120	NA	19.8	J	10.5	J	11.5	J	12.2	J	10.2	J	16.2	J	12.9	J	90.8	J	36.2	J	13.4	J
7440-24-6	STRONTIUM	NA	120	5.1	K	5.4	K	4.6	K	5	K	3.6	K	2.5	K	2.4	K	10.4	K	6.2	K	4.3	K
7440-31-5	TIN	NA	0.89	0.83 [PAL] [UTAG]	J	0.83	J	0.810000	U	0.88	J	0.830000	U	0.82 [PAL] [UTAG]	J	0.830000	U	1.3 [PAL] [UTAG]	J	0.8 [PAL] [UTAG]	J	0.83	U
7440-62-2	VANADIUM	53.3	7.8	18 [PAL] [MDRES] [SSL]		15.9 [PAL] [MDRES] [SSL]		13.6 [PAL] [MDRES] [SSL]		15.2 [PAL] [MDRES] [SSL]		11.7 [PAL] [MDRES] [SSL]		15.8 [PAL] [MDRES] [SSL]		14.4 [PAL] [MDRES] [SSL]		21.1 [PAL] [MDRES] [SSL]		15.5 [PAL] [MDRES] [SSL]		19.7 [PAL] [MDRES] [SSL]	K
7440-66-6	ZINC	37.5	46	23.2		21.1		17.1		16.1		15		11.8		12.2		22.2		16.9		20.6	
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U.)	8.8	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																				
TTNUS046	TOTAL SOLIDS (%)	79.2	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA B (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss03102		x02ss03200		x02ss03202		x02ss03300		x02ss03301		x02ss03303		x02ss03306		x02ss03400		x02ss03402		x02ss03500	
	nsample			X02SS0310024		X02SS0320006		X02SS0320024		X02SS0330006		X02SS0330006-AVG		X02SS0330006-D		X02SS0330024		X02SS0340006		X02SS0340024		X02SS0350006	
	location			X02SB031		X02SB032		X02SB032		X02SB033		X02SB033		X02SB033		X02SB033		X02SB034		X02SB034		X02SB035	
	project_no			00810_2010042		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052	
	sample_coc			X02SS0310024		X02SS0320006		X02SS0320024		X02SS0330006		X02SS0330006-AVG		FD031010-02		X02SS0330024		X02SS0340006		X02SS0340024		X02SS0350006	
	sample_date			20100204		20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310	
	sacode			NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate													X02SS0330006									
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00		0.50		0.50		0.50		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			135		137		139		141		142		144		147		149		151		153	
cas	x	utl95val	minorpal	c_135		c_137		c_139		c_141		c_142		c_144		c_147		c_149		c_151		c_153	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.20	UL	0.2	UL	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	19700	7700	11800 [PAL] [ORNL] [MDRES] [SSL]		13100 [PAL] [ORNL] [MDRES] [SSL]		13100 [PAL] [ORNL] [MDRES] [SSL]		11500 [PAL] [ORNL] [MDRES] [SSL]		11150 [PAL] [ORNL] [MDRES] [SSL]		10800 [PAL] [ORNL] [MDRES] [SSL]		11600 [PAL] [ORNL] [MDRES] [SSL]		11000 [PAL] [ORNL] [MDRES] [SSL]		10900 [PAL] [ORNL] [MDRES] [SSL]		11300 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.065	UL	0.1	UJ	0.099	UJ	0.1	UJ	0.099	UJ	0.098	UJ	0.099	UJ	0.099	UJ	0.098	UJ	0.099	UJ
7440-38-2	ARSENIC	14.9	0.026	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.3 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.3 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.3 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.1 [PAL] [ORNL] [MDRES] [MDSGW]	K	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.1 [PAL] [ORNL] [MDRES] [MDSGW]	K
7440-39-3	BARIUM	80.4	330	56.5	K	66.9		82.1 [BKG]		42.7		56.15		69.6		59.1		48.6		79.3		38.1	
7440-41-7	BERYLLIUM	1.1	16	0.89	J	0.52	J	0.7	J	0.42	J	0.525	J	0.63	J	0.53	J	0.5	J	0.6	J	0.4	J
7440-43-9	CADMIUM	2.5	0.36	0.16	UL	0.083000	U	0.083000	U	0.081000	U	0.082	U	0.083000	U	0.082000	U	0.082000	U	0.083000	U	0.082000	U
7440-70-2	CALCIUM	2060	NA	113	K	1180	J	1060	J	186	J	378	J	570	J	161	J	300	J	190	J	299	J
7440-47-3	CHROMIUM	33.4	26	18.6	K	14.7		13.1		11.2		11.65		12.1		11.9		11.1		11.1		11.7	
7440-48-4	COBALT	22.3	2.3	6.7 [PAL] [ORNL]		5.3 [PAL] [ORNL]		6.4 [PAL] [ORNL]		4.7 [PAL] [ORNL]		5.35 [PAL] [ORNL]		6 [PAL] [ORNL]		5.3 [PAL] [ORNL]		6.3 [PAL] [ORNL]		6.9 [PAL] [ORNL]		4.7 [PAL] [ORNL]	
7440-50-8	COPPER	20.3	28	12.1		8.4	J	7	J	4.6	J	8.5	J	12.4	J	4.8	J	4.8	J	4.7	J	5.8	J
7439-89-6	IRON	38500	5500	24100 [PAL] [ORNL] [MDRES] [SSL]		11800 [PAL] [ORNL] [MDRES] [SSL]		9680 [PAL] [ORNL] [MDRES] [SSL]		9120 [PAL] [ORNL] [MDRES] [SSL]		9290 [PAL] [ORNL] [MDRES] [SSL]		9460 [PAL] [ORNL] [MDRES] [SSL]		9690 [PAL] [ORNL] [MDRES] [SSL]		9900 [PAL] [ORNL] [MDRES] [SSL]		9160 [PAL] [ORNL] [MDRES] [SSL]		9430 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	11	13 [PAL] [SSL]		30.2 [PAL] [SSL]		18.2 [PAL] [SSL]		26.2 [PAL] [SSL]		22.25 [PAL] [SSL]		18.3 [PAL] [SSL]		18.4 [PAL] [SSL]		11.5 [PAL] [SSL]		8.9		15.4 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	2	13.8 [PAL] [OPLNT]		7.5 [PAL] [OPLNT]		7.3 [PAL] [OPLNT]		5.8 [PAL] [OPLNT]		6.45 [PAL] [OPLNT]		7.1 [PAL] [OPLNT]		6.1 [PAL] [OPLNT]		5.7 [PAL] [OPLNT]		5.8 [PAL] [OPLNT]		6.5 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620	4400	848	K	791		939		500		643.5		787		537		511		520		639	
7439-96-5	MANGANESE	1390	160	65.2		605 [PAL] [ORNL] [MDRES] [SSL]	J	538 [PAL] [ORNL] [MDRES] [SSL]	J	180 [PAL] [MDRES]	J	270 [PAL] [ORNL] [MDRES] [SSL]	J	360 [PAL] [ORNL] [MDRES] [SSL]	J	186 [PAL] [ORNL] [MDRES]	J	393 [PAL] [ORNL] [MDRES] [SSL]	J	495 [PAL] [ORNL] [MDRES] [SSL]	J	91.1	J
7439-97-6	MERCURY	0.16	0.058	0.015	J	0.058	K	0.037	K	0.037	K	0.0485	J	0.06 [PAL] [BTAG]	J	0.027	K	0.03	K	0.021	K	0.042	K
7440-02-0	NICKEL	15.4	38	16.5 [BKG]		10.3		11.3		7.7		9.25		10.8		9.1		8.2		10.9		8.8	
7440-09-7	POTASSIUM	1470	NA	1510 [BKG]	K	765	K	689	K	570	K	617	K	664	K	552	K	556	K	525	K	544	K
7782-49-2	SELENIUM	1.2	0.52	0.065	UJ	0.033000	U	0.033000	U	0.033000	U	0.0325	U	0.032000	U	0.033000	U	0.038	J	0.033000	U	0.049	J
7440-22-4	SILVER	0.84	4.2	0.16	U	0.083000	U	0.083000	U	0.081000	U	0.082	U	0.083000	U	0.082000	U	0.082000	U	0.083000	U	0.082000	U
7440-23-5	SODIUM	120	NA	26.5	J	31.1	J	21.2	J	13.9	J	18.3	J	22.7	J	15.8	J	14.3	J	14.2	J	12.2	J
7440-24-6	STRONTIUM	NA	120	8.4	K	11.3	K	7.6	K	4.3	K	5.45	K	6.6	K	4.6	K	4.7	K	4.2	K	4.7	K
7440-31-5	TIN	NA	0.89	1.6	U	0.89	J	0.830000	U	0.820000	U	0.825	U	0.830000	U	0.820000	U	0.820000	U	0.830000	U	0.830000	U
7440-62-2	VANADIUM	53.3	7.8	29.1 [PAL] [MDRES] [SSL]	K	26.5 [PAL] [MDRES] [SSL]		21.2 [PAL] [MDRES] [SSL]		18.9 [PAL] [MDRES] [SSL]		20.05 [PAL] [MDRES] [SSL]		21.2 [PAL] [MDRES] [SSL]		18 [PAL] [MDRES] [SSL]		17.9 [PAL] [MDRES] [SSL]		16.3 [PAL] [MDRES] [SSL]		20.6 [PAL] [MDRES] [SSL]	
7440-66-6	ZINC	37.5	46	44.9 [BKG]		30.1		28.8		20.4		26.5		32.6		21.9		23.4		23.4		22.3	
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U.)	8.8	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																				
TTNUS046	TOTAL SOLIDS (%)	79.2	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-4

SURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x02ss03502		x02ss03600		x02ss03602		x02ss03700		x02ss03702		x02ss03800		x02ss03802		x02ss03900		x02ss03902		x02ss04000	
	nsample			X02SS0350024		X02SS0360006		X02SS0360024		X02SS0370006		X02SS0370024		X02SS0380006		X02SS0380024		X02SS0390006		X02SS0390024		X02SS0400006	
	location			X02SB035		X02SB036		X02SB036		X02SB037		X02SB037		X02SB038		X02SB038		X02SB039		X02SB039		X02SB040	
	project_no			00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010052		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X02SS0350024		X02SS0360006		X02SS0360024		X02SS0370006		X02SS0370024		X02SS0380006		X02SS0380024		X02SS0390006		X02SS0390024		X02SS0400006	
	sample_date			20100310		20100310		20100310		20100310		20100310		20100204		20100204		20100204		20100204		20100204	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																						
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			155		157		159		161		163		165		167		169		171		173	
cas	x	utl95val	minorpal	c_155		c_157		c_159		c_161		c_163		c_165		c_167		c_169		c_171		c_173	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.028	J	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	UJ	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	0.086	J	1.1	U	1.2	U	1.2	U	1.2	U	0.17	J
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	19700	7700	16800 [PAL] [ORNL] [MDRES] [SSL]		7120 [SSL]		11700 [PAL] [ORNL] [MDRES] [SSL]		6490 [SSL]		8070 [PAL] [ORNL] [MDRES] [SSL]		5610 [SSL]		4770 [SSL]		6260 [SSL]		5730 [SSL]		12200 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.099	UJ	0.1	UJ	0.1	UJ	0.046	J	0.042	J	0.032	UL	0.032	UL	0.037	J	0.032	UL	0.038	J
7440-38-2	ARSENIC	14.9	0.026	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.1 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.6 [PAL] [ORNL] [MDRES] [MDSGW]		3.3 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	80.4	330	59.4		31.7		40.2		34.6		54		29.9		27.5		18.1		19.4		28.1	
7440-41-7	BERYLLIUM	1.1	16	0.64		0.51		0.6		0.41	J	0.55		0.42	J	0.50	J	0.17	J	0.18	J	0.21	J
7440-43-9	CADMIUM	2.5	0.36	0.083000	U	0.083000	U	0.082000	U	0.082000	U	0.083000	U	0.083	U	0.083	U	0.082	U	0.081	U	0.083	U
7440-70-2	CALCIUM	2060	NA	191	J	90.6	J	93	J	138	J	87.6	J	89.2		68.7		60.2		36.7		128	
7440-47-3	CHROMIUM	33.4	26	16.9		9		12.3		10.1		11.2		8.9		8.3		9.1		8.6		14.6	
7440-48-4	COBALT	22.3	2.3	7.8 [PAL] [ORNL]		6.6 [PAL] [ORNL]		6.5 [PAL] [ORNL]		9.9 [PAL] [ORNL]		10.5 [PAL] [ORNL]		4.7 [PAL] [ORNL]		5.2 [PAL] [ORNL]		1.2		1.4		2	
7440-50-8	COPPER	20.3	28	6.8	J	5.3	J	5.6	J	28.8 [BKG] [PAL] [SSL]	J	16.4	J	4.3		3.1		18.6		2.8		7.2	
7439-89-6	IRON	38500	5500	14100 [PAL] [ORNL] [MDRES] [SSL]		9920 [PAL] [ORNL] [MDRES] [SSL]		12600 [PAL] [ORNL] [MDRES] [SSL]		11600 [PAL] [ORNL] [MDRES] [SSL]		13600 [PAL] [ORNL] [MDRES] [SSL]		8590 [PAL] [ORNL] [MDRES] [SSL]		8210 [PAL] [ORNL] [MDRES] [SSL]		8960 [PAL] [ORNL] [MDRES] [SSL]		8330 [PAL] [ORNL] [MDRES] [SSL]		12900 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	11	13.7 [PAL] [SSL]		13 [PAL] [SSL]		7.8		15.2 [PAL] [SSL]		8.4		12.4 [PAL] [SSL]		6.2		10.2		6.5		17 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	2	11 [PAL] [OPLNT]		3.8 [PAL] [OPLNT]		5.9 [PAL] [OPLNT]		3.2 [PAL] [OPLNT]		3.6 [PAL] [OPLNT]		3.9 [PAL] [OPLNT]		2.6 [PAL] [OPLNT]		4.5 [PAL] [OPLNT]		3.8 [PAL] [OPLNT]		8.2 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620	4400	1110		389		577		313		332		346		256		336		301		516	
7439-96-5	MANGANESE	1390	160	110	J	90.3	J	89.1	J	271 [PAL] [ORNL] [MDRES] [SSL]	J	358 [PAL] [ORNL] [MDRES] [SSL]	J	88		70		34.3		33		47.7	
7439-97-6	MERCURY	0.16	0.058	0.03	K	0.027	K	0.021	K	0.045	K	0.028	K	0.025		0.014	J	0.022		0.0098	J	0.029	
7440-02-0	NICKEL	15.4	38	14.5		6.8		10.7		7.1		9.3		6.2		6.3		4.2		4.4		6.3	
7440-09-7	POTASSIUM	1470	NA	960	K	344	K	493	K	387	K	528	K	463	K	277	K	631	K	479	K	1070	K
7782-49-2	SELENIUM	1.2	0.52	0.033000	U	0.07	J	0.033000	U	0.18		0.14		0.15	L	0.14	L	0.063	J	0.042	J	0.038	J
7440-22-4	SILVER	0.84	4.2	0.083000	U	0.083000	U	0.082000	U	0.082000	U	0.083000	U	0.083	U	0.083	U	0.082	U	0.081	U	0.083	U
7440-23-5	SODIUM	120	NA	21.1	J	9.1	J	8.9	J	11.2	J	12.2	J	13.3	J	8.3	U	13.5	J	10.2	J	25.8	J
7440-24-6	STRONTIUM	NA	120	5.4	K	3.4	K	3.5	K	4	K	3.9	K	2.9		2.1		2.8		2.4		4.2	
7440-31-5	TIN	NA	0.89	0.830000	U	0.830000	U	0.820000	U	0.820000	U	0.830000	U	0.83	U	0.83	U	0.82	U	0.81	U	0.83	U
7440-62-2	VANADIUM	53.3	7.8	27.9 [PAL] [MDRES] [SSL]		16.1 [PAL] [MDRES] [SSL]		18.9 [PAL] [MDRES] [SSL]		21.6 [PAL] [MDRES] [SSL]		18.8 [PAL] [MDRES] [SSL]		15.8 [PAL] [MDRES] [SSL]		10.7 [PAL] [MDRES] [SSL]		16.3 [PAL] [MDRES] [SSL]		13 [PAL] [MDRES] [SSL]		25.2 [PAL] [MDRES] [SSL]	
7440-66-6	ZINC	37.5	46	33.6		19.4		22.4		16.8		18.9		19.5		16.3		15.2		11.5		20.9	
	Miscellaneous Parameters																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA																	52.7			
TTNUS288	PERCENT MOISTURE (%)	NA	NA																	13.7			
TTNUS002	PH (S.U.)	8.8	NA																	4.59	J		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																	3800			
TTNUS046	TOTAL SOLIDS (%)	79.2	NA																	86.3 [BKG]			

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

	parameter			x02ss04002	
	nsample			X02SS0400024	
	location			X02SB040	
	project_no			00810_2010042	
	sample_coc			X02SS0400024	
	sample_date			20100204	
	sacode			NORMAL	
	matrix			SO	
	duplicate				
	top_depth			0.00	
	bottom_dep			2.00	
	depth_unit			FT	
	submatrix			SS	
	z			175	
cas	x	utl95val	minorpal	c_175	
	Explosives (mg/kg)				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U
2691-41-0	HMX	NA	380	0.2	U
98-95-3	**NITROBENZENE**	NA	0.023	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U
78-11-5	PETN	NA	NA	1.2	U
121-82-4	RDX	NA	5.5	0.2	U
479-45-8	TETRYL	NA	24	0.2	U
	Inorganics (mg/kg)				
7429-90-5	ALUMINUM	19700	7700	12500 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.27	0.035	J
7440-38-2	ARSENIC	14.9	0.026	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	80.4	330	36.3	
7440-41-7	BERYLLIUM	1.1	16	0.30	J
7440-43-9	CADMIUM	2.5	0.36	0.082	U
7440-70-2	CALCIUM	2060	NA	75.3	
7440-47-3	**CHROMIUM**	33.4	26	15.4	
7440-48-4	COBALT	22.3	2.3	2.6 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	6.4	
7439-89-6	IRON	38500	5500	13100 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	**LEAD**	62.5	11	10	
7439-93-2	**LITHIUM**	NA	2	8.9 [PAL] [OPLNT]	
7439-95-4	**MAGNESIUM**	1620	4400	559	
7439-96-5	MANGANESE	1390	160	88.1	
7439-97-6	**MERCURY**	0.16	0.058	0.02	J
7440-02-0	NICKEL	15.4	38	6.9	
7440-09-7	POTASSIUM	1470	NA	1060	K
7782-49-2	SELENIUM	1.2	0.52	0.033	UL
7440-22-4	SILVER	0.84	4.2	0.082	U
7440-23-5	SODIUM	120	NA	23.7	J
7440-24-6	STRONTIUM	NA	120	3.9	
7440-31-5	**TIN**	NA	0.89	0.83	U
7440-62-2	VANADIUM	53.3	7.8	23.5 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	19.8	
	Miscellaneous Parameters				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)	NA	NA		
TTNUS288	PERCENT MOISTURE (%)	NA	NA		
TTNUS002	PH (S.U.)	8.8	NA		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA		

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
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K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column2		column4		column6		column8		column10		column12		column14		column16		column18		column20	
	nsample			X02SB0010204		X02SB0010406		X02SB0020204		X02SB0020406		X02SB0030204		X02SB0030406		X02SB0040204		X02SB0040406		X02SB0050204		X02SB0050406	
	location			X02SB001		X02SB001		X02SB002		X02SB002		X02SB003		X02SB003		X02SB004		X02SB004		X02SB005		X02SB005	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X02SB0010204		X02SB0010406		X02SB0020204		X02SB0020406		X02SB0030204		X02SB0030406		X02SB0040204		X02SB0040406		X02SB0050204		X02SB0050406	
	gis_date			20100312		20100312		20100312		20100312		20100312		20100312		20100315		20100315		20100312		20100312	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																						
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			001		003		005		007		009		011		013		015		017		019	
cas	r	utl95conv	minorpal	c_001		c_003		c_005		c_007		c_009		c_011		c_013		c_015		c_017		c_019	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	35400	7700	10800 [PAL] [ORNL] [MDRES]		13100 [PAL] [ORNL] [MDRES]		11500 [PAL] [ORNL] [MDRES]		12000 [PAL] [ORNL] [MDRES]		13200 [PAL] [ORNL] [MDRES]		30100 [PAL] [ORNL] [MDRES]		11600 [PAL] [ORNL] [MDRES]		15600 [PAL] [ORNL] [MDRES]		10600 [PAL] [ORNL] [MDRES]		10700 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.17	UL	0.032	UL	0.033	UL	0.032	UL	0.16	UL	0.033	UL	0.032	UL	0.033	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	0.96 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.1 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	2 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.1 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.4 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	134	330	50.2		43.8		36.5		50.4		83.8		99.8		44.3		38.3		52.8		37.7	
7440-41-7	BERYLLIUM	3.3	16	0.36	J	0.49	J	0.36	J	0.58	J	0.78	J	0.98	L	0.31	J	0.22	J	0.46	J	0.82	J
7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.17	U	0.17	U	0.17	U	0.083	U	0.16	U	0.081	U	0.082	U	0.17	U	0.16	U
7440-70-2	CALCIUM	2990	NA	57.2		67.2		56.7		241		165		121		92	L	65.4	L	59.4		36.4	
7440-47-3	CHROMIUM	60.1	26	12.8	K	21.4	K	14.7	K	18.3	K	19.9	K	30.1 [PAL] [SSL]	K	10.7	L	14.1	L	12	K	16.4	K
7440-48-4	COBALT	133	2.3	4 [PAL] [ORNL]		3.5 [PAL] [ORNL]		3.4 [PAL] [ORNL]		7.1 [PAL] [ORNL]		8 [PAL] [ORNL]		6.9 [PAL] [ORNL]		3.2 [PAL] [ORNL]		3.4 [PAL] [ORNL]		6.8 [PAL] [ORNL]		11.7 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	4.7		9		3.9		8.5		9.4		18.2	L	3.6	L	3.5	L	3.1		7.3	
7439-89-6	IRON	83100	5500	9060 [PAL] [ORNL] [MDRES]		26700 [PAL] [ORNL] [MDRES]		14100 [PAL] [ORNL] [MDRES]		20800 [PAL] [ORNL] [MDRES]		11700 [PAL] [ORNL] [MDRES]		18200 [PAL] [ORNL] [MDRES]		8410 [PAL] [ORNL] [MDRES]		10900 [PAL] [ORNL] [MDRES]		9940 [PAL] [ORNL] [MDRES]		25300 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	8.2		9		6.9		9.3		7.6		15.6 [PAL] [SSL]		6.8		9.1		8		11.2 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	**9 [PAL] [OPLNT]**		**12.4 [PAL] [OPLNT]**		**13.7 [PAL] [OPLNT]**		**14.1 [PAL] [OPLNT]**		**19.4 [PAL] [ORNL] [OPLNT]**		**36.8 [PAL] [ORNL] [OPLNT]**		**6.8 [PAL] [OPLNT]**		**9.3 [PAL] [OPLNT]**		**10.5 [PAL] [OPLNT]**		**9.9 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	590		825		780		1110		1250		1970		517		669		543		622	
7439-96-5	MANGANESE	4130	160	23.1	J	39.9	J	44.7	J	60.4	J	151	J	43.6	J	115		55.1		149	J	216 [PAL] [ORNL] [MDRES]	J
7439-97-6	MERCURY	0.18	0.058	0.009	J	0.014	UL	0.0068	UL	0.014	UL	0.01	J	0.034	UL	0.019	J	0.014	J	0.0083	J	0.015	J
7440-02-0	NICKEL	18.2	38	7.4		8.2		6.4		11.4		14		21.4 [BKG]		4.8	L	6.3	L	6.3		8.1	
7440-09-7	POTASSIUM	2610	NA	828		1400		1030		1990		2150		3300 [BKG]		698		1110		619		1170	
7782-49-2	SELENIUM	13.3	0.52	0.032	UL	0.044	J	0.032	UL	0.033	UL	0.032	UL	0.16	UL	0.088	J	0.032	UL	0.033	UL	0.27	L
7440-22-4	SILVER	11.4	4.2	0.16	UL	0.17	UL	0.17	UL	0.17	UL	0.083	UL	0.16	UL	0.081	UL	0.082	UL	0.17	UL	0.16	UL
7440-23-5	SODIUM	258	NA	16.5	J	28.9	J	21.3	J	43.5	J	71.5		104		15.4	J	30.5		16.6	U	23.9	J
7440-24-6	STRONTIUM	NA	120	3.9	K	5.1	K	4.5	K	8.8	K	10.5	K	15.2	K	3.6		5.1		2.8	K	3.8	K
7440-31-5	**TIN**	NA	0.89	1.6	U	1.7	U	1.7	U	1.7	U	0.83	U	1.6	U	0.82	U	1.7	U	1.7	U	1.6	U
7440-62-2	VANADIUM	194	7.8	21.2 [PAL] [MDRES] [SSL]	K	34.7 [PAL] [MDRES] [SSL]	K	23.5 [PAL] [MDRES] [SSL]	K	27.9 [PAL] [MDRES] [SSL]	K	30.9 [PAL] [MDRES] [SSL]	K	45.8 [PAL] [ORNL] [MDRES] [SSL]	K	17.8 [PAL] [MDRES] [SSL]	J	24.8 [PAL] [MDRES] [SSL]	J	21.5 [PAL] [MDRES] [SSL]	K	32.7 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	70.4	46	24.3		22.5		21.5		28.9		38.4		62.8 [PAL] [SSL]		16.2	L	20.8	J	21.9		22.5	
	Miscellaneous																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U)	NA	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																				
TTNUS046	TOTAL SOLIDS(%)	NA	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column22		column24		column26		column28		column30		column32		column34		column36		column38		column40	
	nsample			X02SB0060204		X02SB0060406		X02SB0070204		X02SB0070406		X02SB0080204		X02SB0080406		X02SB0090204		X02SB0090406		X02SB0100204		X02SB0100406	
	location			X02SB006		X02SB006		X02SB007		X02SB007		X02SB008		X02SB008		X02SB009		X02SB009		X02SB010		X02SB010	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X02SB0060204		X02SB0060406		X02SB0070204		X02SB0070406		X02SB0080204		X02SB0080406		X02SB0090204		X02SB0090406		X02SB0100204		X02SB0100406	
	gis_date			20100312		20100312		20100312		20100312		20100312		20100312		20100312		20100312		20100312		20100312	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																						
	top_depth			2.00	4.00	2.00	4.00	2.00	4.00	2.00	4.00	2.00	4.00	2.00	4.00	2.00	4.00	2.00	4.00	2.00	4.00	2.00	4.00
	bottom_dep			4.00	6.00	4.00	6.00	4.00	6.00	4.00	6.00	4.00	6.00	4.00	6.00	4.00	6.00	4.00	6.00	4.00	6.00	4.00	6.00
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			021		023		025		027		029		031		033		035		037		039	
cas	r	utl95conv	minorpal	c_021		c_023		c_025		c_027		c_029		c_031		c_033		c_035		c_037		c_039	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UR	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	35400	7700	19500 [PAL] [ORNL] [MDRES]		11300 [PAL] [ORNL] [MDRES]		29800 [PAL] [ORNL] [MDRES]		7940 [PAL] [ORNL] [MDRES]		30900 [PAL] [ORNL] [MDRES]		27000 [PAL] [ORNL] [MDRES]		11500 [PAL] [ORNL] [MDRES]		15500 [PAL] [ORNL] [MDRES]		16800 [PAL] [ORNL] [MDRES]		11800 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.16	UL	0.065	UL	0.16	UL	0.17	UL	0.065	U	0.064	U	0.032	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	1.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	6.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	6.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.1 [PAL] [ORNL] [MDRES] [MDSGW]		3.7 [PAL] [ORNL] [MDRES] [MDSGW]		3.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	5.7 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	134	330	83.4		51.7		58.9		29.1		74.6		73.8		74.8		30		51.9		29.7	
7440-41-7	BERYLLIUM	3.3	16	0.95	J	0.63	L	0.7	L	0.77	J	0.62	J	0.87	J	0.64	J	0.4	J	0.8	J	0.46	J
7440-43-9	CADMIUM	0.61	0.36	0.17	U	0.083	U	0.082	U	0.16	U	0.16	U	0.33	U	0.16	U	0.16	U	0.16	U	0.16	U
7440-70-2	CALCIUM	2990	NA	86.3		116		72.9		66.6		164		115		115		26.2		44.7		31.2	
7440-47-3	CHROMIUM	60.1	26	28.4 [PAL] [SSL]	K	17	K	34.2 [PAL] [SSL]	K	37.4 [PAL] [SSL]	K	33.8 [PAL] [SSL]	K	32.9 [PAL] [SSL]	K	20		19.1		20.7	K	20.2	K
7440-48-4	COBALT	133	2.3	8.2 [PAL] [ORNL]		8 [PAL] [ORNL]		3.4 [PAL] [ORNL]		2.6 [PAL] [ORNL]		3.8 [PAL] [ORNL]		3.5 [PAL] [ORNL]		8 [PAL] [ORNL]		3.8 [PAL] [ORNL]		5.2 [PAL] [ORNL]		2.8 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	14.9		7		6.7		2.7		13.5		11.3		7.4		8.8		11.9		7.6	
7439-89-6	IRON	83100	5500	17500 [PAL] [ORNL] [MDRES]		10600 [PAL] [ORNL] [MDRES]		11500 [PAL] [ORNL] [MDRES]		26000 [PAL] [ORNL] [MDRES]		33000 [PAL] [ORNL] [MDRES]		42600 [PAL] [ORNL] [MDRES]		17200 [PAL] [ORNL] [MDRES]		20500 [PAL] [ORNL] [MDRES]		22000 [PAL] [ORNL] [MDRES]		18800 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	14.2 [PAL] [SSL]		8		9.9		5.4		14.2 [PAL] [SSL]		14 [PAL] [SSL]		8.5		8.2		10.6		7.5	
7439-93-2	**LITHIUM**	NA	2	**29.4 [PAL] [ORNL] [OPLNT]**		**10.9 [PAL] [OPLNT]**		**18.7 [PAL] [ORNL] [OPLNT]**		**6.8 [PAL] [OPLNT]**		**22 [PAL] [ORNL] [OPLNT]**		**20.9 [PAL] [ORNL] [OPLNT]**		**12 [PAL] [OPLNT]**		**12.4 [PAL] [OPLNT]**		**17.1 [PAL] [ORNL] [OPLNT]**		**10.1 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1810		1150		2110		1990		1630		1470		1180		799		1060		610	
7439-96-5	MANGANESE	4130	160	32.5	J	17.5	J	26.2	J	16.1	J	46.5	J	24.2	J	148		50.7		38.1	J	28.2	J
7439-97-6	MERCURY	0.18	0.058	0.0069	UL	0.0069	UL	0.035	UL	0.014	UL	0.035	UL	0.038	J	0.027	J	0.018	J	0.024	J	0.012	J
7440-02-0	NICKEL	18.2	38	15.2		10.8		10.2		4.8	K	12.7		13.3		11.5		8.8		13.3		7.3	
7440-09-7	POTASSIUM	2610	NA	2790 [BKG]		1440		3070 [BKG]		3460 [BKG]		2940 [BKG]		3080 [BKG]		1380		1210		1350		1140	
7782-49-2	SELENIUM	13.3	0.52	0.033	UL	0.032	UL	0.16	UL	0.16	UL	0.16	UL	0.17	UL	0.16	U	0.16	U	0.096	J	0.096	J
7440-22-4	SILVER	11.4	4.2	0.17	UL	0.083	UL	0.082	UL	0.16	UL	0.16	UL	0.33	UL	0.16	U	0.16	U	0.16	UL	0.16	UL
7440-23-5	SODIUM	258	NA	132		144		212		113		85.4		76.4	J	33.6	J	28.2	J	26	J	25.7	J
7440-24-6	STRONTIUM	NA	120	12.2	K	7	K	8.1	K	4.1	K	10.8	K	10.1	K	5.9		3.8		5.8	K	3.5	K
7440-31-5	**TIN**	NA	0.89	1.7	U	0.83	U	**0.97 [PAL] [BTAG]**	J	1.7	U	1.6	U	3.3	U	1.6	U	1.6	U	1.6	U	1.6	U
7440-62-2	VANADIUM	194	7.8	42.9 [PAL] [ORNL] [MDRES] [SSL]	K	23.7 [PAL] [MDRES] [SSL]	K	41.8 [PAL] [ORNL] [MDRES] [SSL]	K	28.5 [PAL] [MDRES] [SSL]	K	59 [PAL] [ORNL] [MDRES] [SSL]	K	61.3 [PAL] [ORNL] [MDRES] [SSL]	K	32.2 [PAL] [MDRES] [SSL]		31.2 [PAL] [MDRES] [SSL]		35.7 [PAL] [MDRES] [SSL]	K	30 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	70.4	46	45.4		36		22.1		18.2	K	32.7		29.8		29.4		24.1		37.9		20.1	
	Miscellaneous																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U)	NA	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																				
TTNUS046	TOTAL SOLIDS(%)	NA	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column42		column44		column46		column48		column50		column52		column54		column56		column58		column60	
	nsample			X02SB0120204		X02SB0120406		X02SB0140204		X02SB0140406		X02SB0160204		X02SB0160406		X02SB0180204		X02SB0180406		X02SB0240204		X02SB0240406	
	location			X02SB012		X02SB012		X02SB014		X02SB014		X02SB016		X02SB016		X02SB018		X02SB018		X02SB024		X02SB024	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X02SB0120204		X02SB0120406		X02SB0140204		X02SB0140406		X02SB0160204		X02SB0160406		X02SB0180204		X02SB0180406		X02SB0240204		X02SB0240406	
	gis_date			20100312		20100312		20100315		20100315		20100312		20100312		20100312		20100312		20100315		20100315	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																						
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			041		043		045		047		049		051		053		055		057		059	
cas	r	utl95conv	minorpal	c_041		c_043		c_045		c_047		c_049		c_051		c_053		c_055		c_057		c_059	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.19	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.1	U	0.11	J	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	35400	7700	11900 [PAL] [ORNL] [MDRES]		13000 [PAL] [ORNL] [MDRES]		19900 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]		14500 [PAL] [ORNL] [MDRES]		34700 [PAL] [ORNL] [MDRES]		15700 [PAL] [ORNL] [MDRES]		16300 [PAL] [ORNL] [MDRES]		13700 [PAL] [ORNL] [MDRES]		9390 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.033	UL	0.032	UL	0.033	UL	0.047	J	0.033	UL	0.033	UL	0.033	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	2.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	0.72 [PAL] [ORNL] [MDRES] [MDSGW]	J	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	6.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	134	330	23.8		33.1		34.5	J	30.7	J	41.5	J	63.1	J	26.7	J	33.6	J	74.1	J	42.6	J
7440-41-7	BERYLLIUM	3.3	16	0.18	J	0.29	J	0.33	UJ	0.23	J	0.33	J	0.75	J	0.32	UL	0.45	J	0.63	J	0.43	J
7440-43-9	CADMIUM	0.61	0.36	0.081	U	0.081	U	0.16	U	0.081	U	0.082	U	0.33	U	0.16	U	0.16	U	0.16	U	0.083	U
7440-70-2	CALCIUM	2990	NA	22.6		51.3		39.4	L	47.6	L	85.9	L	154	L	77.8	L	40.6	L	55.9	L	46.9	L
7440-47-3	CHROMIUM	60.1	26	12.5	K	14.4	K	14.2	L	12.3	L	17.2	L	32.3 [PAL] [SSL]	L	18.3	L	18.8	L	17.8	L	13.3	L
7440-48-4	COBALT	133	2.3	0.88		1.8		11.1 [PAL] [ORNL]		2.1		2.6 [PAL] [ORNL]		4.2 [PAL] [ORNL]		2.2		2.4 [PAL] [ORNL]		9.2 [PAL] [ORNL]		7.1 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	2.4		4.4		6.6	L	5.5	L	7.1	L	15.6	L	9.1	L	9.7	L	10.8	L	7	L
7439-89-6	IRON	83100	5500	5250		6550 [PAL] [ORNL] [MDRES]		18600 [PAL] [ORNL] [MDRES]		11400 [PAL] [ORNL] [MDRES]		11500 [PAL] [ORNL] [MDRES]		46900 [PAL] [ORNL] [MDRES]		18900 [PAL] [ORNL] [MDRES]		21100 [PAL] [ORNL] [MDRES]		23700 [PAL] [ORNL] [MDRES]		16500 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	5.9		8.2		7.7		5.3		8.3		15.4 [PAL] [SSL]		8.3		9.5		11.3 [PAL] [SSL]		7.9	
7439-93-2	**LITHIUM**	NA	2	**7.5 [PAL] [OPLNT]**		**10.1 [PAL] [OPLNT]**		**9.5 [PAL] [OPLNT]**		**7.6 [PAL] [OPLNT]**		**13.2 [PAL] [OPLNT]**		**23.2 [PAL] [ORNL] [OPLNT]**		**11.5 [PAL] [OPLNT]**		**11.3 [PAL] [OPLNT]**		**13.3 [PAL] [OPLNT]**		**8.6 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	381		585		688		556		817		1440		652		594		885		650	
7439-96-5	MANGANESE	4130	160	10.9	J	15.9	J	357 [PAL] [ORNL] [MDRES] [SSL]		31.6		24.9		42.7		13.8		17.8		220 [PAL] [ORNL] [MDRES]		104	
7439-97-6	MERCURY	0.18	0.058	0.0088	J	0.014	J	0.027	J	0.02	J	0.015	J	0.043	J	0.011	J	0.0085	J	0.018	J	0.012	J
7440-02-0	NICKEL	18.2	38	3.3		5.4		6.1	L	4.9	L	7.5	L	13.9	L	6.5	L	7.1	L	13.6	L	9.7	L
7440-09-7	POTASSIUM	2610	NA	932		1190		851		854		1300		1780		992		998		1200		849	
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	UL	0.092	J	0.032	UL	0.085	J	0.098	J	0.14	L	0.26	L	0.12	L	0.086	J
7440-22-4	SILVER	11.4	4.2	0.081	UL	0.081	UL	0.16	UL	0.081	UL	0.082	UL	0.33	UL	0.16	UL	0.16	UL	0.16	UL	0.083	UL
7440-23-5	SODIUM	258	NA	23.3	J	31.8		16.5	U	15.5	J	32.8		35	J	16.8	J	16.4	J	20.5	J	14.7	J
7440-24-6	STRONTIUM	NA	120	3.7	K	4.8	K	2.8	K	2.9		5.5		7.9		4.1		4.2		6.3		5.1	
7440-31-5	**TIN**	NA	0.89	0.82	U	0.82	U	1.7	U	0.82	U	0.82	U	3.3	U	1.6	U	1.6	U	1.6	U	0.83	U
7440-62-2	VANADIUM	194	7.8	27.1 [PAL] [MDRES] [SSL]	K	20 [PAL] [MDRES] [SSL]	K	24.8 [PAL] [MDRES] [SSL]	J	21.2 [PAL] [MDRES] [SSL]	J	29.6 [PAL] [MDRES] [SSL]	J	57.9 [PAL] [ORNL] [MDRES] [SSL]	J	29.1 [PAL] [MDRES] [SSL]	J	30.9 [PAL] [MDRES] [SSL]	J	26.8 [PAL] [MDRES] [SSL]	J	20.3 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	8.7		13.6		18.3	L	13.6	L	21.9	L	43.3	L	19.6	L	22.1	L	34.4	L	24.3	L
	Miscellaneous																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U)	NA	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																				
TTNUS046	TOTAL SOLIDS(%)	NA	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column62		column64		column66		column68		column70		column71		column73		column76		column78		column79	
	nsample			X02SB0260204		X02SB0260406		X02SB0270204		X02SB0270406		X02SB0310204		X02SB0310204-AVG		X02SB0310204-D		X02SB0310406		X02SB0320204		X02SB0320204-AVG	
	location			X02SB026		X02SB026		X02SB027		X02SB027		X02SB031		X02SB031		X02SB031		X02SB031		X02SB032		X02SB032	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X02SB0260204		X02SB0260406		X02SB0270204		X02SB0270406		X02SB0310204		X02SB0310204-AVG		FD031510-03		X02SB0310406		X02SB0320204		X02SB0320204-AVG	
	gis_date			20100312		20100312		20100312		20100312		20100315		20100315		20100315		20100315		20100313		20100313	
	qc_type			NM		NM		NM		NM		NM		NM		FD		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL		ORIG		AVG	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate															X02SB0310204							
	top_depth			2.00		4.00		2.00		4.00		2.00		2.00		2.00		4.00		2.00		2.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		4.00		4.00		6.00		4.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			061		063		065		067		069		070		072		075		077		078	
cas	r	utl95conv	minorpal	c 061		c 063		c 065		c 067		c 069		c 070		c 072		c 075		c 077		c 078	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.245	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.245	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	ALUMINUM	35400	7700	31400 [PAL] [ORNL] [MDRES]		17800 [PAL] [ORNL] [MDRES]		21400 [PAL] [ORNL] [MDRES]		11700 [PAL] [ORNL] [MDRES]		25300 [PAL] [ORNL] [MDRES]		21650 [PAL] [ORNL] [MDRES]		18000 [PAL] [ORNL] [MDRES]		18700 [PAL] [ORNL] [MDRES]		12500 [PAL] [ORNL] [MDRES]		13400 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.16	UL	0.16	UL	0.033	J	0.032	UL	0.033	UL	0.0325	UL	0.032	UL	0.065	UL	0.032	UL	0.032	UL
7440-38-2	ARSENIC	18.9	0.026	5.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	2 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	4 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	2 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	134	330	68.1		31.3		63	J	27.2	J	81.5	J	74.2	J	66.9	J	102	J	61.3	J	60.75	J
7440-41-7	BERYLLIUM	3.3	16	0.67	J	0.55	J	0.63	J	0.25	J	1.3	L	1.2	L	1.1	L	1.7	L	0.55	L	0.535	L
7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.16	U	0.16	U	0.082	U	0.16	U	0.16	U	0.16	U	0.16	U	0.082	U	0.0815	U
7440-70-2	CALCIUM	2590	NA	265		179		315	L	73.8	L	30.5	L	28.45	L	26.4	L	53.1	L	136	L	149	L
7440-47-3	CHROMIUM	60.1	26	32.5 [PAL] [SSL]	K	21.8	K	28 [PAL] [SSL]	L	13.1	L	26.2 [PAL] [SSL]	L	23.85	L	21.5	L	24.1	L	12	L	13.05	L
7440-48-4	COBALT	133	2.3	5.5 [PAL] [ORNL]		2.8 [PAL] [ORNL]		5 [PAL] [ORNL]		1.9		8.1 [PAL] [ORNL]		7.55 [PAL] [ORNL]		7 [PAL] [ORNL]		11.2 [PAL] [ORNL]		4.1 [PAL] [ORNL]		4.25 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	15.6		7.3		9.7	L	5.8	L	20	L	18.35	L	16.7	L	20.3	L	4.6	L	4.6	L
7439-89-6	IRON	83100	5500	21400 [PAL] [ORNL] [MDRES]		18900 [PAL] [ORNL] [MDRES]		22900 [PAL] [ORNL] [MDRES]		5320		33300 [PAL] [ORNL] [MDRES]		31050 [PAL] [ORNL] [MDRES]		28900 [PAL] [ORNL] [MDRES]		33700 [PAL] [ORNL] [MDRES]		9130 [PAL] [ORNL] [MDRES]		9815 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	12.5 [PAL] [SSL]		7		12.9 [PAL] [SSL]		6.4		14.2 [PAL] [SSL]		13.3 [PAL] [SSL]		12.4 [PAL] [SSL]		15.6 [PAL] [SSL]		8.3		9.4	
7439-93-2	**LITHIUM**	NA	2	**22.4 [PAL] [ORNL] [OPLNT]**		**9.2 [PAL] [OPLNT]**		**19.8 [PAL] [ORNL] [OPLNT]**		**8.8 [PAL] [OPLNT]**		**25.3 [PAL] [ORNL] [OPLNT]**		**23.1 [PAL] [ORNL] [OPLNT]**		**20.9 [PAL] [ORNL] [OPLNT]**		**23.2 [PAL] [ORNL] [OPLNT]**		**8.1 [PAL] [OPLNT]**		**8.95 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1630		709		1650		632		1640		1475		1310		1760		720		769	
7439-96-5	MANGANESE	4130	160	56.2	J	52.5	J	39.5		15.5		66		62.3		58.6		72.2		121		114	
7439-97-6	MERCURY	0.18	0.058	0.035	UJ	0.034	UJ	0.026	J	0.013	J	0.039	J	0.0425	J	0.046	J	0.036	J	0.015	J	0.016	J
7440-02-0	NICKEL	18.2	38	15.2		6.6		13.2	L	5.6	L	23 [BKG]	L	21.35 [BKG]	L	19.7 [BKG]	L	28.9 [BKG]	L	7.8	L	8.25	L
7440-09-7	POTASSIUM	2610	NA	2300		1010		2090		1040		2380		2060		1740		2040		729		864.5	
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	UL	0.032	UL	0.032	UL	0.13	L	0.1095	J	0.089	J	0.14	L	0.032	UL	0.032	UL
7440-22-4	SILVER	11.4	4.2	0.16	UL	0.16	UL	0.16	UL	0.082	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.082	UL	0.0815	UL
7440-23-5	SODIUM	258	NA	59.5		17.2	J	39.7	J	20.8	J	47.9	J	41.75	J	35.6	J	54.6		13.7	J	17.2	J
7440-24-6	STRONTIUM	NA	120	8.5	K	4.8	K	9.9		4.3		10.1		9.4		8.7		12.3		5		5.6	
7440-31-5	TIN	NA	0.89	1.7	U	1.6	U	1.6	U	0.82	U	1.6	U	1.6	U	1.6	U	1.7	U	0.82	U	0.815	U
7440-62-2	VANADIUM	194	7.8	54.6 [PAL] [ORNL] [MDRES] [SSL]	K	28.8 [PAL] [MDRES] [SSL]	K	47.4 [PAL] [ORNL] [MDRES] [SSL]	J	21 [PAL] [MDRES] [SSL]	J	40.8 [PAL] [ORNL] [MDRES] [SSL]	J	36.8 [PAL] [MDRES] [SSL]	J	32.8 [PAL] [MDRES] [SSL]	J	37 [PAL] [MDRES] [SSL]	J	23.4 [PAL] [MDRES] [SSL]	J	24.3 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	39.8		19.5		36.2	L	15.2	L	64.2 [PAL] [SSL]	L	59.25 [PAL] [SSL]	L	54.3 [PAL] [SSL]	L	**77.8 [BKG] [PAL] [SSL]**	L	26.6	L	28.4	L
	Miscellaneous																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U)	NA	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																				
TTNUS046	TOTAL SOLIDS(%)	NA	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 5-5

SUBSURFACE SOIL SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column81		column84		column86		column88	
	nsample			X02SB0320204-D		X02SB0320406		X02SB0350204		X02SB0350406	
	location			X02SB032		X02SB032		X02SB035		X02SB035	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			FD031310-01		X02SB0320406		X02SB0350204		X02SB0350406	
	gis_date			20100313		20100313		20100315		20100315	
	qc_type			FD		NM		NM		NM	
	sacode			DUP		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO	
	duplicate			X02SB0320204							
	top_depth			2.00		4.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB	
	z			080		083		085		087	
cas	f	utl95conv	minorpal	c_080		c_083		c_085		c_087	
	Explosives (mg/kg)										
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.19	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.19	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.24	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.19	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.19	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.19	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.24	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.19	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.19	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.19	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.19	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.19	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.19	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.19	U	0.2	U	0.2	U
	Inorganics (mg/kg)										
7429-90-5	ALUMINUM	35400	7700	14300 [PAL] [ORNL] [MDRES]		12000 [PAL] [ORNL] [MDRES]		20800 [PAL] [ORNL] [MDRES]		14600 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.033	UL	0.033	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	134	330	60.2	J	23.3	J	66.7	J	26.6	J
7440-41-7	BERYLLIUM	3.3	16	0.52	L	0.24	J	0.65	L	0.26	J
7440-43-9	CADMIUM	0.61	0.36	0.081	U	0.083	U	0.082	U	0.083	U
7440-70-2	CALCIUM	2590	NA	162	L	162	L	121	L	35.3	L
7440-47-3	CHROMIUM	60.1	26	14.1	L	16.5	L	18.4	L	13	L
7440-48-4	COBALT	133	2.3	4.4 [PAL] [ORNL]		2.2		7.3 [PAL] [ORNL]		2.8 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	4.6	L	8.5	L	7.1	L	7.1	L
7439-89-6	IRON	83100	9500	10500 [PAL] [ORNL] [MDRES]		9870 [PAL] [ORNL] [MDRES]		16600 [PAL] [ORNL] [MDRES]		10900 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	10.5		8.6		10.8		6.9	
7439-93-2	**LITHIUM**	NA	2	**9.8 [PAL] [OPLNT]**		**10.3 [PAL] [OPLNT]**		**13.1 [PAL] [OPLNT]**		**9.7 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	858		688		1280		626	
7439-96-5	MANGANESE	4130	160	107		19.8		91.8		24.5	
7439-97-6	MERCURY	0.18	0.058	0.017	J	0.016	J	0.034	J	0.015	J
7440-02-0	NICKEL	18.2	38	8.7	L	6.7	L	11.9	L	6.7	L
7440-09-7	POTASSIUM	2610	NA	1000		970		1180		882	
7782-49-2	SELENIUM	13.3	0.52	0.032	UL	0.033	UL	0.033	UL	0.033	UL
7440-22-4	SILVER	11.4	4.2	0.081	UL	0.083	UL	0.082	UL	0.083	UL
7440-23-5	SODIUM	258	NA	20.7	J	14.7	J	21.5	J	12	J
7440-24-6	STRONTIUM	NA	120	6.2		4.8		5.2		3.1	
7440-31-5	TIN	NA	0.89	0.81	U	0.83	U	0.82	U	0.83	U
7440-62-2	VANADIUM	194	7.8	25.2 [PAL] [MDRES] [SSL]	J	25.5 [PAL] [MDRES] [SSL]	J	30 [PAL] [MDRES] [SSL]	J	23.9 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	30.2	L	19.1	L	36.3	L	19.7	L
	Miscellaneous										
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA					36.7		43.9	
TTNUS288	PERCENT MOISTURE (%)	NA	NA					18.8		15.6	
TTNUS002	PH (S.U)	NA	NA					4.43		4.76	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA					2520		633	J
TTNUS046	TOTAL SOLIDS(%)	NA	NA					81.2		84.4	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

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TABLE 5-6

SEDIMENT SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter		column2		column4	column5	column6	column11	column7	column8	column9	column10	column12	column13	column14	column15	column16	column17	column18	column19
	nsample		X02SD001		X02SD002	X02SD002-QUAL	X02SD003	X02SD003-QUAL	X02SD003-AVG	X02SD003-AVG-QUAL	X02SD003-D	X02SD003-D-QUAL	X02SD004	X02SD004-QUAL	X02SD005	X02SD005-QUAL	X02SD006	X02SD006-QUAL	X02SD007	X02SD007-QUAL
	location		X02SD001		X02SD002	X02SD002	X02SD003	X02SD003	X02SD003	X02SD003	X02SD003	X02SD003	X02SD004	X02SD004	X02SD005	X02SD005	X02SD006	X02SD006	X02SD007	X02SD007
	project_no		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc		X02SD001		X02SD002		X02SD003		X02SD003-AVG		FD020310-01		X02SD004		X02SD005		X02SD006		X02SD007	
	gis_date		20100203		20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203	20100203
	matrix		SD		SD		SD		SD		SD		SD		SD		SD		SD	
	duplicate										X02SD003									
	top_depth		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50	
	depth_unit		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	z		001		003	004	005	010	006	007	008	009	011	012	013	014	015	016	017	018
cas	x	utl95	c 001		c 003	c 004	c 005	c 010	c 006	c 007	c 008	c 009	c 011	c 012	c 013	c 014	c 015	c 016	c 017	c 018
	Explosives (mg/kg)																			
99-35-4	1,3,5-TRINITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.20	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.20	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	0.25	U	0.25	U	0.25	U	0.25	UL	0.25	UL	0.24	UL	0.25	UL	0.25	UL	0.25	UL
99-08-1	3-NITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	0.2	U	0.2	U	0.2	U	0.20	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL
479-45-8	TETRYL	NA	0.2	U	0.2	U	0.2	U	0.20	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																			
7429-90-5	ALUMINUM	52362	4650		15200		14000	J	19450	J	24900	J	17200	J	26800	J	19700	J	23800	J
7440-36-0	ANTIMONY	NA	0.037	B	0.21	B	0.21	B	0.205	B	0.20	B	0.092	B	0.055	B	0.054	B	0.23	B
7440-38-2	ARSENIC	63	1.3		6.2 [PAL] [ORNL]		6.5 [PAL] [ORNL]		6.9 [PAL] [ORNL]		7.3 [PAL] [ORNL]		2.1		2		2.5		1.9	
7440-39-3	BARIUM	577	37.3	K	114 [PAL] [NOAA]	K	101 [PAL] [NOAA]	K	97.85 [PAL] [NOAA]	K	94.7 [PAL] [NOAA]	K	115 [PAL] [NOAA]	K	124 [PAL] [NOAA]	K	105 [PAL] [NOAA]	K	78.3 [PAL] [NOAA]	K
7440-41-7	BERYLLIUM	10.9	0.24	J	2.3		0.97		0.935		0.90		1.1		1.2		0.96		0.79	
7440-43-9	CADMIUM	1.85	0.082	U	1.2 [PAL] [BTAG]		0.54		0.53		0.52		1.1 [PAL] [BTAG]		1 [PAL] [BTAG]		0.90		0.97	
7440-70-2	CALCIUM	88137	139		5710		4380		4300	K	4220	K	875	K	1010	K	629	K	785	K
7440-47-3	CHROMIUM	79.2	7.7	K	16.1	K	15.1	K	14.55	K	14	K	29	K	29.4	K	31.5	K	19.2	K
7440-48-4	COBALT	118	2.8		43.1 [PAL] [ORNL]		15		14.45		13.9		5.9		5.9		6.2		4.1	
7440-50-8	COPPER	297	5.3		25.9		23.2		21.1		19		30.4		41.6 [PAL] [BTAG]		24.9		25.7	
7439-89-6	IRON	193218	3760		17300		14100		13200		12300		8810		7830		10700		6930	
7439-92-1	LEAD	476	9.4		48.8 [PAL] [BTAG]		44.1 [PAL] [BTAG]		44.85 [PAL] [BTAG]		45.6 [PAL] [BTAG]		36.7 [PAL] [BTAG]		32.2		36.3 [PAL] [BTAG]		42 [PAL] [BTAG]	
7439-93-2	LITHIUM	NA	5.6		14.9		13.5		13.2		12.9		18.2		18		20.2		11.3	
7439-95-4	MAGNESIUM	19043	398	K	2250	K	1910	K	1890	K	1870	K	1050	K	1090	K	1190	K	719	K
7439-96-5	MANGANESE	2561	31.4		234		143		141	K	139	K	47.6	K	53.2	K	50	K	40.6	K
7439-97-6	MERCURY	0.778	0.071		0.24 [PAL] [BTAG]		0.20 [PAL] [BTAG]		0.175	J	0.15	J	0.18		0.16		0.20 [PAL] [BTAG]	J	0.42 [PAL] [BTAG]	
7440-02-0	NICKEL	382	6.3		37.1 [PAL] [BTAG]		21.2		20.4		19.6		18.6		19.4		18.6		13.5	
7440-09-7	POTASSIUM	5061	698	K	1160	K	958	K	949.5	K	941	K	1220	K	1310	K	1490	K	909	K
7782-49-2	SELENIUM	6.45	0.16		1.2	L	0.99	L	1.145	L	1.3	L	0.76	L	0.91	L	0.43	L	0.50	L
7440-22-4	SILVER	0.92	0.082	U	0.083	U	0.085	J	0.0975	J	0.11	J	0.083	U	0.083	U	0.081	U	0.083	U
7440-23-5	SODIUM	472	23	J	763 [BKG]		700 [BKG]		702 [BKG]	K	704 [BKG]	K	77.9	K	84.2	K	67.1	K	51.4	K
7440-24-6	STRONTIUM	NA	5.2	K	50.6	K	40.4	K	39.8	K	39.2	K	10.2	K	11.4	K	9.3	K	9	K
7440-31-5	TIN	NA	0.82	U	2	J	1.6	J	1.5	J	1.4	J	1	J	1.2	J	1.4	J	1	J
7440-62-2	VANADIUM	196	12.5	K	53.1	K	43.4	K	41.75	K	40.1	K	34.4	K	32.9	K	40.2	K	29.5	K
7440-66-6	ZINC	1660	17.7		215 [PAL] [BTAG]		129 [PAL] [BTAG]		124.5 [PAL] [BTAG]		120		79.8		75.3		73		63.7	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported

TABLE 5-6

SEDIMENT SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased l

K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased h

TABLE 5-7

GROUNDWATER SAMPLING RESULTS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter							column2		column3		column5		column8		column10		column12		column14		column16	
	rnsample							X02GW001		X02GW001-AVG		X02GW001-D		X02GW002		X02GW003		X02TW001/SB032		X02TW002/SB029		X02GW006	
	location							25MW01		25MW01		25MW01		25MW02		25MW03		X02TW001/SB032		X02TW002/SB029		X02TW003/SB012	
	project_no							00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010051		00810_2010051	
	sample_coc							X02GW001		X02GW001-AVG		FD031410-03		X02GW002		X02GW003		X02GW004		X02GW005		X02GW006	
	gis_date							20100314		20100314		20100314		20100315		20100315		20100315		20100316		20100316	
	qc_type							NM		NM		FD		NM		NM		NM		NM		NM	
	sacode							ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix							GW		GW		GW		GW		GW		GW		GW		GW	
	duplicate											X02GW001											
	top_depth							-9999		-9999		-9999		-9999		-9999		-9999		-9999		-9999	
	bottom_dep							-9999		-9999		-9999		-9999		-9999		-9999		-9999		-9999	
	z							001		002		004		007		009		011		013		015	
cas	x	minorpal	omitap	omitap_b	mcl	mde	reference	c_001		c_002		c_004		c_007		c_009		c_011		c_013		c_015	
	Explosives (ug/L)																						
99-35-4	1,3,5-TRINITROBENZENE	110	110	N	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
99-65-0	1,3-DINITROBENZENE	0.37	0.37	N	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	2.2	2.2	C	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
121-14-2	2,4-DINITROTOLUENE	0.22	0.22	C	NA	7.3	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	3.7	3.7	N	NA	3.7	MDE Cleanup Standard			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUE	7.3	7.3	N	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
88-72-2	2-NITROTOLUENE	0.31	0.31	C	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA		NA	NA	NA			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
99-08-1	3-NITROTOLUENE	0.37	0.37	N	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUE	7.3	7.3	N	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
99-99-0	4-NITROTOLUENE	4.2	4.2	C	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
2691-41-0	HMX	180	180	N	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
98-95-3	NITROBENZENE	0.12	0.12	C	NA	0.35	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
55-63-0	NITROGLYCERIN	0.37	0.37	N	NA	NA	ORNL-R			1.4	UJ	1.4	UJ	1.4	UJ	1.4	UJ	1.5	UJ	1.5	UJ	1.4	UJ
78-11-5	PETN	NA	NA		NA	NA	NA			1.4	U	1.4	U	1.4	U	1.4	U	1.5	U	1.5	U	1.4	U
121-82-4	RDX	0.61	0.61	C	NA	NA	ORNL-R			0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
479-45-8	TETRYL	15	15	N	NA	NA	ORNL-R			0.29	U	0.29	U	0.29	U	0.28	U	0.3	U	0.29	U	0.29	U
	Inorganics (ug/L)																						
7429-90-5	**ALUMINUM**	50	3700	N	50	50	MDE Cleanup Standard	**910 [PAL] [MCL] [MDE]**	J	**485.5 [PAL] [MCL] [MDE]**	J	**61.0 [PAL] [MCL] [MDE]**	J	**140 [PAL] [MCL] [MDE]**	J	**60.0 [PAL] [MCL] [MDE]**	J	**200 [PAL] [MCL] [MDE]**	J	**4300 [PAL] [ORNLTAP] [MCL] [MDE]**		**120 [PAL] [MCL] [MDE]**	
7440-36-0	ANTIMONY	1.5	1.5	N	6	6	ORNL-R	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U
7440-38-2	**ARSENIC**	0.045	0.045	C	10	10	ORNL-R	1	U	1	U	1	U	1	U	1	U	1	U	**2.2 [PAL] [ORNLTAP]**	K	**1.4 [PAL] [ORNLTAP]**	K
7440-39-3	BARIUM	730	730	N	2000	2000	ORNL-R	29	J	54.5	J	80	J	44	J	35	J	34	J	47		20	
7440-41-7	BERYLLIUM	4	7.3	N	4	4	MDE Cleanup Standard	0.3	UL	0.235	JL	0.32	J	0.3	UL	0.3	UL	0.3	UL	0.3	U	0.3	U
7440-43-9	CADMIUM	1.8	1.8	N	5	5	ORNL-R	0.37	U	0.2825	J	0.38	J	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U
7440-70-2	CALCIUM	NA	NA		NA	NA	NA	1300	J	1350	J	1400		420		2300		2600		1000		1500	
7440-47-3	CHROMIUM	100	5500	N	100	100	MDE Cleanup Standard	6.7		3.85		2	U	2	U	2	U	2	U	5.7	J	2	U
7440-48-4	**COBALT**	1.1	1.1	N	NA	NA	ORNL-R	**16.0 [PAL] [ORNLTAP]**		**10.3 [PAL] [ORNLTAP]**	J	**4.6 [PAL] [ORNLTAP]**	J	2	U	2	U	2	U	**3.1 [PAL] [ORNLTAP]**	J	**4.7 [PAL] [ORNLTAP]**	J
7440-50-8	COPPER	150	150	N	1300	1300	ORNL-R	8.7	J	4.25	J	3.6	U	7.4	J	3.6	U	22		6.3	B	4	B
7439-89-6	**IRON**	300	2600	N	300	300	MDE Cleanup Standard	**1200 [PAL] [MCL] [MDE]**	J	**631.5 [PAL] [MCL] [MDE]**	J	63	J	130	J	91	J	**720 [PAL] [MCL] [MDE]**	J	**5300 [PAL] [ORNLTAP] [MCL] [MDE]**	J	**930 [PAL] [MCL] [MDE]**	J
7439-92-1	LEAD	15	NA		15	15	MDE Cleanup Standard	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	2.2	U	3	J
7439-93-2	LITHIUM	7.3	7.3	N	NA	NA	ORNL-R	36	U	36	U	36	U	36	U	36	U	36	U	36	U	36	U
7439-95-4	MAGNESIUM	NA	NA		NA	NA	NA	740	J	2520	J	4300	J	980	J	720	J	2100	J	910		790	
7439-96-5	**MANGANESE**	50	88	N	50	50	MDE Cleanup Standard	47	J	**78.5 [PAL] [MCL] [MDE]**	J	**110 [PAL] [ORNLTAP] [MCL] [MDE]**	J	**150 [PAL] [ORNLTAP] [MCL] [MDE]**	J	8.3	J	31	J	**51.0 [PAL] [MCL] [MDE]**		48	
7439-97-6	MERCURY	1.1	1.1	N	2	2	ORNL-R	0.077	UL	0.077	UL	0.077	UL	0.077	UL	0.077	UL	0.077	UL	0.077	U	0.077	U
7440-02-0	NICKEL	73	73	N	NA	73	MDE Cleanup Standard	9.7	J	15.85	J	22		7.3	U	7.3	U	7.3	U	7.3	U	7.3	U
7440-09-7	POTASSIUM	NA	NA		NA	NA	NA	2200		2550		2900		790		1500		1200		1500	J	1100	J
7782-49-2	SELENIUM	18	18	N	50	50	ORNL-R	3.5	J	3.8	J	4.1	J	3.5	J	4.1	J	4	J	3.9	B	3.5	B
7440-22-4	SILVER	18	18	N	100	100	ORNL-R	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U	1.4	U
7440-23-5	SODIUM	NA	NA		NA	NA	NA	3400		4800		6200		3000		2600		5000		4100		3500	
7440-24-6	STRONTIUM	2200	2200	N	NA	NA	ORNL-R	10		13		16		8		15		21		11		10	
7440-31-5	TIN	2200	2200	N	NA	2200	MDE Cleanup Standard	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U
7440-62-2	**VANADIUM**	3.7	18	N	NA	3.7	MDE Cleanup Standard	**6.0 [PAL] [MDE]**	J	3.5	J	2	U	2	U	2	U	2	U	**10.0 [PAL] [MDE]**		2	U
7440-66-6	ZINC	1100	1100	N	5000	5000	ORNL-R	13	J	31.5	J	50		15	J	7.3	U	41		12	J	8.9	J
	Inorganics, Filtered (ug/L)																						
7429-90-5	**ALUMINUM**	50	3700	N	50	50	MDE Cleanup Standard	**140 [PAL] [MCL] [MDE]**	J	**190 [PAL] [MCL] [MDE]**	J	**240 [PAL] [MCL] [MDE]**	J							**63 [PAL] [MCL] [MDE]**	J	26	U
7440-36-0	ANTIMONY	1.5	1.5	N	6	6	ORNL-R	0.66	U	0.52	J	0.71	J							0.66	U	0.66	U
7440-38-2	**ARSENIC**	0.045	0.045	C	10	10	ORNL-R	1	U	1	U	1	U							**1.2 [PAL] [ORNLTAP]**	J	1	U
7440-39-3	BARIUM	730	730	N	2000	2000	ORNL-R	22		19		16								28		17	
7440-41-7	BERYLLIUM	4	7.3	N	4	4	MDE Cleanup Standard	0.72	B	0.86	B	1	B							0.49	B	0.33	U
7440-43-9	CADMIUM	1.8	1.8	N	5	5	ORNL-R	0.33	U	0.33	U	0.33	U							0.33	U	0.33	U
7440-70-2	CALCIUM	NA	NA		NA	NA	NA	1200		1200		1200								1100		1400	
7440-47-3	CHROMIUM	100	5500	N	100	100	MDE Cleanup Standard	4.8	J	2.8	J	1.6	U							1.6	U	1.6	U
7440-48-4	**COBALT**	1.1	1.1	N	NA	NA	ORNL-R	**15 [PAL] [ORNLTAP]**		**15.5 [PAL] [ORNLTAP]**		**16 [PAL] [ORNLTAP]**								**3 [PAL] [ORNLTAP]**	J	**4.9 [PAL] [ORNLTAP]**	J
7440-50-8	COPPER	150	150	N	1300	1300	ORNL-R	4.8	J	4.5	J	4.2	J							3.3	U	3.3	U
7439-89-6	**IRON**	300	2600	N	300	300	MDE Cleanup Standard	**730 [PAL] [MCL] [MDE]**	J	**490 [PAL] [MCL] [MDE]**	J	250	J							**3600 [PAL] [ORNLTAP] [MCL] [MDE]**		**610 [PAL] [MCL] [MDE]**	J
7439-92-1	LEAD	15	NA		15	15	MDE Cleanup Standard	2	UL	2	UL	2	UL							2	UL	2	UL
7439-93-2	LITHIUM	7.3	7.3	N	NA	NA	ORNL-R	33	U	33	U	33	U							33	U	33	U
7439-95-4	MAGNESIUM	NA	NA		NA	NA	NA	680		615		550								710		760	
7439-96-5	MANGANESE	50	88	N	50	50	MDE Cleanup Standard	37		38		39								49		47	
7439-97-6	MERCURY	1.1	1.1	N	2	2	ORNL-R	0.066	U	0.2015	U	0.037	U							0.066	U	0.066	U
7440-02-0	NICKEL	73	73	N	NA	73	MDE Cleanup Standard	11	J	11	J	11	J							6.6	U	6.6	U
7440-09-7	POTASSIUM	NA	NA		NA	NA	NA	2000		1800		1600								880		1100	
7782-49-2	SELENIUM	18	18	N	50	50	ORNL-R	1.6	U	1.6	U	1.6	U							1.6	U	1.6	U
7440-22-4	SILVER	18	18	N	100	100	ORNL-R	1.3	U	1.3	U	1.3	U							1.3	U	1.3	U
7440-23-5	**SODIUM**	**NA**	**NA**		**NA**	**NA**	**NA**	**3500**		**3500**		**3500**								**4400**		**3700**	
7440-24-6	STRONTIUM	2200	2200	N	NA	NA	ORNL-R	9.2		8.55		7.9								9.1		10	
7440-31-5	TIN	2200	2200	N	NA	2200	MDE Cleanup Standard	6.6	U	6.6	U	6.6	U							6.6	U	6.6	U
7440-62-2	VANADIUM	3.7	18	N	NA	3.7	MDE Cleanup Standard	3.5	J	2.15	J	1.6	U							1.6	U	1.6	U
7440-66-6	ZINC	1100	1100	N	5000	5000	ORNL-R	9.6	J	8.8	J	8	J							6.6	U	6.6	U

ug/L = micrograms per liter
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 6-4

SURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

																x04ss00100		x04ss00102		x04ss00200		x04ss00202		x04ss00300		x04ss00302	
	nsample															X04SS0010006		X04SS0010024		X04SS0020006		X04SS0020024		X04SS0030006		X04SS0030024	
	location															X04SB001		X04SB001		X04SB002		X04SB002		X04SB003		X04SB003	
	project_no															00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc															X04SS0010006		X04SS0010024		X04SS0020006		X04SS0020024		X04SS0030006		X04SS0030024	
	gis_date															20100318		20100318		20100318		20100318		20100317		20100317	
	qc_type															NM		NM		NM		NM		NM		NM	
	sacode															NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix															SO		SO		SO		SO		SO		SO	
	duplicate																										
	top_depth															0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep															0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit															FT		FT		FT		FT		FT		FT	
	submatrix															SS		SS		SS		SS		SS		SS	
	z															001		003		005		007		009		011	
cas	x	utl95cv	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	lanl	reference	c_001		c_003		c_005		c_007		c_009		c_011	
	Explosives (mg/kg)																										
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	N	NA	NA	NA	NA	NA	NA	9	18	NC	Sunahara Plant	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	3.6		NA	NA	NA	NA	NA	NA	6	12	NC	ORNL-R	0.25	U	0.24	U	0.23	U	0.23	U	0.24	U	0.23	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	C	16	0.57	NA	NA	NA	NA	6	20	NC	MDE Cleanup Standard S-GW	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	N	7.8	0.25	NA	NA	NA	NA	5	7	NC	MDE Cleanup Standard S-GW	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NC	NC	80	ORNL-R	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	C	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	0.25	U	0.24	U	0.23	U	0.23	U	0.24	U	0.23	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
99-99-0	4-NITROTOLUENE	0.21	30	30	C	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
2691-41-0	HMX	NA	380	380	N	NA	NA	NA	NA	NA	NA	9341	600	NC	ORNL-R	0.2	U	0.19	U	0.18	U	0.18	UL	0.19	U	0.19	U
98-95-3	NITROBENZENE	NA	0.023	4.8	C	3.9	0.023	NA	NA	NA	40	NC	NC	NC	MDE Cleanup Standard S-GW	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	1.2	U	0.13	J	1.1	U	1.1	U	1.2	U	1.1	U
78-11-5	PETN	NA	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	1.2	U	1.2	U	1.1	U	1.1	U	1.2	U	1.1	U
121-82-4	RDX	NA	5.5	5.5	C	NA	NA	NA	NA	NA	NA	9537	98	NC	ORNL-R	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
479-45-8	TETRYL	NA	24	24	N	NA	NA	NA	NA	NA	NA	NC	NC	25	ORNL-R	0.2	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U
	Inorganics (mg/kg)																										
7429-90-5	**ALUMINUM**	19700	7700	7700	N	7800	NA	NA	NC	NC	NC	NC	NC	NC	ORNL-R	**26000 [BKG] [PAL] [ORNL] [MDRES]**		**23600 [BKG] [PAL] [ORNL] [MDRES]**		212		19700 [PAL] [ORNL] [MDRES]		18000 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]	
7440-36-0	**ANTIMONY**	NA	0.27	3.1	N	3.1	13	0.27	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.16	UL	**0.45 [PAL] [SSL]**	B	0.16	UL	0.16	UL	0.082	J	0.042	J
7440-38-2	ARSENIC	14.9	0.026	0.39	C	0.43	0.026	18	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW	5.1 [PAL] [ORNL] [MDRES] [MDSGW]	K	9.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.7 [PAL] [ORNL] [MDRES] [MDSGW]		3.8 [PAL] [ORNL] [MDRES] [MDSGW]		5 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.3 [PAL] [ORNL] [MDRES] [MDSGW]	K
7440-39-3	BARIUM	80.4	330	1500	N	1600	6000	330	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	76.9		86.8 [BKG]		54		60.5		73.4		79.2	
7440-41-7	BERYLLIUM	1.1	16	16	N	16	1200	21	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	0.76	J	0.72	J	0.58	J	0.58	J	0.65	J	0.69	J
7440-43-9	CADMIUM	2.5	0.36	7	N	3.9	27	0.36	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.16	U	0.2	J	0.16	U	0.17	J	0.3	J	0.17	J
7440-70-2	CALCIUM	2060	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	199		1710		2100 [BKG]		9230 [BKG]		1280		855	
7440-47-3	CHROMIUM	33.4	26	12000		NA	NA	26	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	26.2 [PAL] [SSL]		25.8		20.5		22.5		26.1 [PAL] [SSL]		28.9 [PAL] [SSL]	
7440-48-4	COBALT	22.3	2.3	2.3	N	NA	NA	13	NC	NC	NC	NC	NC	NC	ORNL-R	16.3 [PAL] [ORNL] [SSL]		12.8 [PAL] [ORNL]		5.3 [PAL] [ORNL]		5.5 [PAL] [ORNL]		6.5 [PAL] [ORNL]		6.6 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	310	N	310	11000	28	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	10.2		11.9		11.6		14.2		13.2		**29 [BKG] [PAL] [SSL]**	
7439-89-6	IRON	38500	5500	5500	N	5500	NA	NA	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	22200 [PAL] [ORNL] [MDRES]		19600 [PAL] [ORNL] [MDRES]		14600 [PAL] [ORNL] [MDRES]		17200 [PAL] [ORNL] [MDRES]		19900 [PAL] [ORNL] [MDRES]		29300 [PAL] [ORNL] [MDRES]	
7439-92-1	**LEAD**	62.5	11	400		400	NA	11	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	36.3 [PAL] [SSL]		**122 [BKG] [PAL] [SSL]**		11.9 [PAL] [SSL]		22.9 [PAL] [SSL]		**102 [BKG] [PAL] [SSL]**	K	**94.2 [BKG] [PAL] [SSL]**	K
7439-93-2	**LITHIUM**	NA	2	16	N	NA	NA	NA	NA	2	NA	NC	NC	NC	ORNL Plant	**16.5 [PAL] [ORNL] [OPLNT]**		**15.2 [PAL] [OPLNT]**		**18.1 [PAL] [ORNL] [OPLNT]**		**18.3 [PAL] [ORNL] [OPLNT]**		**18.1 [PAL] [ORNL] [OPLNT]**		**23.7 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	1620	4400	NA		NA	NA	NA	4400	NC	NC	NC	NC	NC	R3BTAG	1370		1460		1680 [BKG]		2280 [BKG]		1670 [BKG]		1620	
7439-96-5	MANGANESE	1390	160	180	N	160	950	220	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	610 [PAL] [ORNL] [MDRES] [SSL]		562 [PAL] [ORNL] [MDRES] [SSL]		72.3		134		297 [PAL] [ORNL] [MDRES] [SSL]		180 [PAL] [MDRES]	
7439-97-6	**MERCURY**	0.16	0.058	2.3	N	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	R3BTAG	0.057	J	0.048	J	0.035	UL	0.035	UL	0.10 [PAL] [BTAG]	J	0.066 [PAL] [BTAG]	J
7440-02-0	**NICKEL**	15.4	38	150	N	160	NA	38	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	14.4		14.1		12.1		15.5 [BKG]		18.4 [BKG]		17.8 [BKG]	
7440-09-7	POTASSIUM	1470	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	1260		1570 [BKG]		1550 [BKG]		1380		1340		2020 [BKG]	
7782-49-2	SELENIUM	1.2	0.52	39	N	39	19	0.52	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.16	UL	0.16	UL	0.16	U	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	0.84	4.2	39	N	39	31	4.2	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.17	U
7440-23-5	SODIUM	120	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	22.9	J	39.8	J	46.6	J	49.8		48.7	J	65.4	
7440-24-6	STRONTIUM	NA	120	4700	N	NA	NA	NA	120	NC	NC	NC	NC	NC	R3BTAG	5.8		23		10.6		20.9		10.2		9.9	
7440-31-5	**TIN**	NA	0.89	4700	N	4700	NA	NA	0.89	NC	NC	NC	NC	NC	R3BTAG	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.7	U
7440-62-2	VANADIUM	53.3	7.8	39	N	7.8	730	7.8	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	40.6 [PAL] [ORNL] [MDRES] [SSL]		36.6 [PAL] [MDRES] [SSL]		27.7 [PAL] [MDRES] [SSL]		30.9 [PAL] [MDRES] [SSL]		32.5 [PAL] [MDRES] [SSL]	K	40.8 [PAL] [ORNL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	2300	N	2300	14000	46	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	40.8 [BKG]		**113 [BKG] [PAL] [SSL]**		38.4 [BKG]		42.8 [BKG]		**239 [BKG] [PAL] [SSL]**		**206 [BKG] [PAL] [SSL]**	
	Miscellaneous																										
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC													
TTNUS288	PERCENT MOISTURE (%)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		16.7		22.8		17.9		19.8		22.4		21	
TTNUS002	PH (s.u.)	8.8	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC													
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC													
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		**83.3**		77.2		**82.1**		**80.2**		77.6		79	
	Volatile Organics (ug/kg)																										
71-43-2	**BENZENE**	NA	1.9	1100	C	12000	1.9	NA	100	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW	**2 [PAL] [MDSGW]**		2.2	U	0.54	J	1.6	U	1.6	U	1.9	U
75-15-0	CARBON DISULFIDE	NA	19000	82000	N	780000	19000	NA	NA	NA	NA	NC	NC	NC	MDE Cleanup Standard S-GW	1.9	U	2.2	U	1.5	B	1.6	U	1.6	U	1.9	U
67-66-3	CHLOROFORM	NA	0.91	290	C	78000	0.91	NA	300	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW	1.9	U	2.2	U	1.6	U	1.6	U	1.6	U	1.9	U
60-29-7	DIETHYL ETHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		1.9	U	2.2	U	1.6	U	1.6	U	1.6	U	1.9	U
75-09-2	METHYLENE CHLORIDE	NA	19	11000	C	85000	19	NA	300	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW	3.4	B	4.4	B	3.9	B	2.1	B	1.8	B	1.2	B
108-88-3	TOLUENE	140	100	500000	N	630000	27000	NA	100	NC	NC	NC	NC	NC	R3BTAG	3.3	J	2.2	U	1.6	U	1.6	U	1.9	B	1.9	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 6-4

SURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	nsample			x04ss00400		x04ss00402		x04ss00500		x04ss00502		x04ss00600		x04ss00602		x04ss00700		x04ss00702		x04ss00703	
	location			X04SS0040006		X04SS0040024		X04SS0050006		X04SS0050024		X04SS0060006		X04SS0060024		X04SS0070006		X04SS0070024		X04SS0070024-AVG	
	project_no			X04SB004		X04SB004		X04SB005		X04SB005		X04SB006		X04SB006		X04SB007		X04SB007		X04SB007	
	sample_coc			00810_20100061		00810_20100061		00810_20100061		00810_20100061		00810_20100061		00810_20100061		00810_20100061		00810_20100061		00810_20100061	
	gis_date			X04SS0040006		X04SS0040024		X04SS0050006		X04SS0050024		X04SS0060006		X04SS0060024		X04SS0070006		X04SS0070024		X04SS0070024-AVG	
	qc_type			20100318		20100318		20100318		20100318		20100318		20100318		20100318		20100318		20100318	
	sacode			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	matrix			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG	
	duplicate			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			013		015		017		019		021		023		025		027		028	
cas	x	utl95cv	minorpal	c_013		c_015		c_017		c_019		c_021		c_023		c_025		c_027		c_028	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.23	U	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.23	U	0.24	U	0.23	U	0.24	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	0.089	J	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	19700	7700	**21700 [BKG] [PAL] [ORNL] [MDRES]**		256		**21200 [BKG] [PAL] [ORNL] [MDRES]**		**24900 [BKG] [PAL] [ORNL] [MDRES]**		**20600 [BKG] [PAL] [ORNL] [MDRES]**		19400 [PAL] [ORNL] [MDRES]		14700 [PAL] [ORNL] [MDRES]		16300 [PAL] [ORNL] [MDRES]		16500 [PAL] [ORNL] [MDRES]	
7440-36-0	**ANTIMONY**	NA	0.27	0.16	UL	0.16	UL	0.17	UL	**0.33 [PAL] [SSL]**	B	0.16	UL	0.17	UL	0.13	B	0.18	B	0.17	U
7440-38-2	ARSENIC	14.9	0.026	4.5 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.3 [PAL] [ORNL] [MDRES] [MDSGW]	K	4.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	5 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.9 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.7 [PAL] [ORNL] [MDRES] [MDSGW]	K	5.1 [PAL] [ORNL] [MDRES] [MDSGW]	K
7440-39-3	BARIUM	80.4	330	71		82.9 [BKG]		64.5		72.2		57.9		67.9		67.3		60.7		61	
7440-41-7	BERYLLIUM	1.1	16	0.69	J	0.8	J	0.71	J	0.76	J	0.62	J	0.69	J	0.6	J	0.59	J	0.595	J
7440-43-9	CADMIUM	2.5	0.36	0.16	U	0.16	U	0.17	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
7440-70-2	CALCIUM	2060	NA	199		213		202		280		173		186		227		260		219.5	
7440-47-3	CHROMIUM	33.4	26	25.7		26.9 [PAL] [SSL]		28 [PAL] [SSL]		28.6 [PAL] [SSL]		23		24.8		18.7		23.7		22.6	
7440-48-4	COBALT	22.3	2.3	19.7 [PAL] [ORNL] [SSL]		17.3 [PAL] [ORNL] [SSL]		17.6 [PAL] [ORNL] [SSL]		14.4 [PAL] [ORNL] [SSL]		15.2 [PAL] [ORNL] [SSL]		16.8 [PAL] [ORNL] [SSL]		11.2 [PAL] [ORNL]		11.8 [PAL] [ORNL]		11.5 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	10.2		10.5		10		11		14		14.5		10.7		10.4		9.55	
7439-89-6	IRON	38500	5500	19100 [PAL] [ORNL] [MDRES]		22300 [PAL] [ORNL] [MDRES]		21600 [PAL] [ORNL] [MDRES]		23900 [PAL] [ORNL] [MDRES]		22600 [PAL] [ORNL] [MDRES]		23800 [PAL] [ORNL] [MDRES]		15300 [PAL] [ORNL] [MDRES]		16500 [PAL] [ORNL] [MDRES]		17050 [PAL] [ORNL] [MDRES]	
7439-92-1	**LEAD**	62.5	11	**85.7 [BKG] [PAL] [SSL]**		40.1 [PAL] [SSL]		19.7 [PAL] [SSL]		16.6 [PAL] [SSL]		24.4 [PAL] [SSL]		24.5 [PAL] [SSL]		35.3 [PAL] [SSL]		36.5 [PAL] [SSL]	J	28.35 [PAL] [SSL]	J
7439-93-2	**LITHIUM**	NA	2	**13.6 [PAL] [OPLNT]**		**17.5 [PAL] [ORNL] [OPLNT]**		**16.8 [PAL] [ORNL] [OPLNT]**		**21.2 [PAL] [ORNL] [OPLNT]**		**16.9 [PAL] [ORNL] [OPLNT]**		**17.3 [PAL] [ORNL] [OPLNT]**		**12.2 [PAL] [OPLNT]**		**12.4 [PAL] [OPLNT]**		**13.35 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	1620	4400	1110		1450		1290		1560		1040		1120		805		816		896.5	
7439-96-5	MANGANESE	1390	160	842 [PAL] [ORNL] [MDRES] [SSL]		643 [PAL] [ORNL] [MDRES] [SSL]		680 [PAL] [ORNL] [MDRES] [SSL]		503 [PAL] [ORNL] [MDRES] [SSL]		474 [PAL] [ORNL] [MDRES] [SSL]		564 [PAL] [ORNL] [MDRES] [SSL]		605 [PAL] [ORNL] [MDRES] [SSL]		632 [PAL] [ORNL] [MDRES] [SSL]		529 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	**MERCURY**	0.16	0.058	0.063 [PAL] [BTAG]	J	0.065 [PAL] [BTAG]	J	0.056	J	0.066 [PAL] [BTAG]	J	0.052	J	0.054	J	0.051	J	0.049	J	0.03325	JL
7440-02-0	**NICKEL**	15.4	38	13		15.2		13.9		15.4		14.1		15.5 [BKG]		10.7		10.9		10.85	
7440-09-7	POTASSIUM	1470	NA	1190		1460		1370		1810 [BKG]		1340		1370		931		989		1214.5	
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.16	U	0.17	UL	0.16	UL	0.16	UL	0.17	UL	0.16	UL	0.17	UL	0.165	UL
7440-22-4	SILVER	0.84	4.2	0.16	U	0.16	U	0.17	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U
7440-23-5	SODIUM	120	NA	23.6	J	28.8	J	26.2	J	43	J	26.2	J	27	J	19.7	J	21.2	J	26.55	J
7440-24-6	STRONTIUM	NA	120	5.3		6.6		5.9		8.1		5.7		5.9		7.7		7.9		7.9	
7440-31-5	**TIN**	NA	0.89	1.6	U	1.6	U	1.7	U	1.6	U	1.6	U	1.6	U	1.7	U	1.6	U	1.6	U
7440-62-2	VANADIUM	53.3	7.8	39.6 [PAL] [ORNL] [MDRES] [SSL]		42.2 [PAL] [ORNL] [MDRES] [SSL]		42.8 [PAL] [ORNL] [MDRES] [SSL]		44.9 [PAL] [ORNL] [MDRES] [SSL]		32.6 [PAL] [MDRES] [SSL]		34.2 [PAL] [MDRES] [SSL]		26.9 [PAL] [MDRES] [SSL]		27.2 [PAL] [MDRES] [SSL]		27.75 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	38.3 [BKG]		42.5 [BKG]		43.7 [BKG]		44.7 [BKG]		45.5 [BKG]		**47.7 [BKG] [PAL] [SSL]**		**54.1 [BKG] [PAL] [SSL]**		**64.6 [BKG] [PAL] [SSL]**		**57.3 [BKG] [PAL] [SSL]**	
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA	27.3		23.4		22.5		21.1		23		22.2		25.6		17.6		17.6	
TTNUS002	PH (s.u.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS048	**TOTAL SOLIDS (%)**	79.2	NA	72.7		76.6		77.5		78.9		77		77.8		74.4		**82.4**		**82.4**	
	Volatile Organics (ug/kg)																				
71-43-2	**BENZENE**	NA	1.9	1.8	U	1.8	U	2	U	1.3	U	1.8	U	1.8	U	2.1	U	1.9	UJ	**6.675 [PAL] [MDSGW]**	J
75-15-0	CARBON DISULFIDE	NA	19000	1.8	U	1.8	U	2	U	1.3	U	1.8	U	1.8	U	2.1	U	1.9	U	1.7	U
67-66-3	CHLOROFORM	NA	0.91	1.8	U	1.8	U	2	U	1.3	U	1.8	U	1.8	U	2.1	U	1.9	U	1.7	U
60-29-7	DIETHYL ETHER	NA	NA	1.8	U	1.8	U	2	U	1.3	U	1.8	U	1.8	U	2.1	U	1.9	U	1.7	U
75-09-2	METHYLENE CHLORIDE	NA	19	2.8	B	4.1	B	4.5	B	3	B	4	B	3.8	B	3.9	B	2.5	B	3	B
108-88-3	TOLUENE	140	100	1.8	U	0.76	J	2	U	1.3	U	1.8	U	1.8	U	2.1	U	1.9	UJ	64.975	J

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit
laboratory are reported in this manner. This qualifier is also added to a positive r

UJ – The analytical method could not detect the analyte at the sample specific de
inaccurate or imprecise based on validation review criteria. The associated num

J –The chemical was present; however, the associated numerical result is not a p
sample. The laboratory reported concentration is an estimate of the true concent

L –The chemical was present; however, the associated numerical
result is not a precise representation of the concentration that is
actually present in the sample. The laboratory reported concentration
is an estimate of the true concentration and biased low.

TABLE 6-4

SURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

cas	x	utl95cv	minorpal																
				x04ss00705		x04ss00800		x04ss00801		x04ss00803		x04ss00806		x04ss00900		x04ss00902		x04ss01000	
	nsample			X04SS0070024-D		X04SS0080006		X04SS0080006-AVG		X04SS0080006-D		X04SS0080024		X04SS0090006		X04SS0090024		X04SS0100006	
	location			X04SB007		X04SB008		X04SB008		X04SB008		X04SB008		X04SB009		X04SB009		X04SB010	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			FD031810-02		X04SS0080006		X04SS0080006-AVG		FD031810-01		X04SS0080024		X04SS0090006		X04SS0090024		X04SS0100006	
	gis_date			20100318		20100318		20100318		20100318		20100318		20100318		20100318		20100317	
	qc_type			FD		NM		NM		FD		NM		NM		NM		NM	
	sacode			DUP		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate			X04SS0070024						X04SS0080006									
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		0.50		0.50		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS	
	z			030		033		034		036		039		041		043		045	
cas	x	utl95cv	minorpal	c_030		c_033		c_034		c_036		c_039		c_041		c_043		c_045	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.245	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.245	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	U	0.195	UL	0.19	UL	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																		
7429-90-5	**ALUMINUM**	19700	7700	16700 [PAL] [ORNL] [MDRES]		13800 [PAL] [ORNL] [MDRES]		14600 [PAL] [ORNL] [MDRES]		15400 [PAL] [ORNL] [MDRES]		14800 [PAL] [ORNL] [MDRES]		17600 [PAL] [ORNL] [MDRES]		17000 [PAL] [ORNL] [MDRES]		16700 [PAL] [ORNL] [MDRES]	
7440-36-0	**ANTIMONY**	NA	0.27	0.16	UL	0.054	B	0.107	U	0.16	UL	0.033	UL	0.26	B	0.18	B	0.099	J
7440-38-2	ARSENIC	14.9	0.026	4.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.35 [PAL] [ORNL] [MDRES] [MDSGW]	K	4.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.7 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.1 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	K
7440-39-3	BARIUM	80.4	330	61.3		63.5		68.3		73.1		69.3		46.7		54.3		63.3	
7440-41-7	BERYLLIUM	1.1	16	0.6	J	0.49	J	0.62	J	0.75	J	0.61		0.48	J	0.48	J	0.57	J
7440-43-9	CADMIUM	2.5	0.36	0.16	U	0.082	U	0.121	U	0.16	U	0.083	U	0.16	U	0.083	U	1.6 [PAL] [SSL]	
7440-70-2	CALCIUM	2060	NA	179		375		311		247		313		266		226		1980	
7440-47-3	CHROMIUM	33.4	26	21.5		14.2	J	20.2	J	26.2 [PAL] [SSL]	J	15.5		16.5		15.2		22.7	
7440-48-4	COBALT	22.3	2.3	11.2 [PAL] [ORNL]		5.4 [PAL] [ORNL]	J	9.5 [PAL] [ORNL]	J	13.6 [PAL] [ORNL] [SSL]	J	6.2 [PAL] [ORNL]		5.6 [PAL] [ORNL]		6.7 [PAL] [ORNL]		6.2 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	8.7		11.1		12		12.9		7.1		16.1		10.9		13	
7439-89-6	IRON	38500	5500	17600 [PAL] [ORNL] [MDRES]		10300 [PAL] [ORNL] [MDRES]	J	13900 [PAL] [ORNL] [MDRES]	J	17500 [PAL] [ORNL] [MDRES]	J	11200 [PAL] [ORNL] [MDRES]		15500 [PAL] [ORNL] [MDRES]		13300 [PAL] [ORNL] [MDRES]		17200 [PAL] [ORNL] [MDRES]	
7439-92-1	**LEAD**	62.5	11	20.2 [PAL] [SSL]	J	51.3 [PAL] [SSL]		43.5 [PAL] [SSL]		35.7 [PAL] [SSL]		29.5 [PAL] [SSL]		54.9 [PAL] [SSL]		39.1 [PAL] [SSL]		29.6 [PAL] [SSL]	K
7439-93-2	**LITHIUM**	NA	2	**14.3 [PAL] [OPLNT]**		**10.3 [PAL] [OPLNT]**		**11.7 [PAL] [OPLNT]**		**13.1 [PAL] [OPLNT]**		**11.1 [PAL] [OPLNT]**		**12.4 [PAL] [OPLNT]**		**12.3 [PAL] [OPLNT]**		**20.7 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	1620	4400	977		1040		1017.5		995		1210		835		859		1210	
7439-96-5	MANGANESE	1390	160	426 [PAL] [ORNL] [MDRES] [SSL]		195 [PAL] [ORNL] [MDRES]	J	337.5 [PAL] [ORNL] [MDRES] [SSL]	J	480 [PAL] [ORNL] [MDRES] [SSL]	J	154		128		143		144	
7439-97-6	**MERCURY**	0.16	0.058	0.035	UL	0.045	J	0.059 [PAL] [BTAG]	J	0.073 [PAL] [BTAG]	J	0.027	J	0.059 [PAL] [BTAG]	J	0.042	J	0.057	J
7440-02-0	**NICKEL**	15.4	38	10.8		8.5		11.4		14.3		10.1		13.9		11.9		20.9 [BKG]	
7440-09-7	POTASSIUM	1470	NA	1440		932		1061		1190		941		1010		998		1470	
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	0.84	4.2	0.16	U	0.082	U	0.121	U	0.16	U	0.083	U	0.16	U	0.083	U	0.16	U
7440-23-5	SODIUM	120	NA	31.9	J	22.4	J	27.35	J	32.3	J	27.5		21.9	J	23.9	J	54.1	
7440-24-6	STRONTIUM	NA	120	7.9		6.3		6.3		6.3		6.7		5.8		5.5		10.8	
7440-31-5	**TIN**	NA	0.89	1.6	U	0.83	U	1.215	U	1.6	U	0.83	U	1.6	U	**1.1 [PAL] [BTAG]**	J	1.7	U
7440-62-2	VANADIUM	53.3	7.8	28.3 [PAL] [MDRES] [SSL]		22.5 [PAL] [MDRES] [SSL]		29.3 [PAL] [MDRES] [SSL]		36.1 [PAL] [MDRES] [SSL]		23.4 [PAL] [MDRES] [SSL]		31.7 [PAL] [MDRES] [SSL]		26.1 [PAL] [MDRES] [SSL]		35.2 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	**50 [BKG] [PAL] [SSL]**		30.5		39.15 [BKG]		**47.8 [BKG] [PAL] [SSL]**		30.3		39.4 [BKG]		38.1 [BKG]		**57.1 [BKG] [PAL] [SSL]**	
	Miscellaneous																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA									43		68.9					
TTNUS288	PERCENT MOISTURE (%)	NA	NA			20		20				19.7		23.3		24.3		17.6	
TTNUS002	PH (s.u.)	8.8	NA									5.04		4.04					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA									2410		15800					
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA			**80**		**80**				**80.3**		76.7		75.7		**82.4**	
	Volatile Organics (ug/kg)																		
71-43-2	**BENZENE**	NA	1.9	**12.4 [PAL] [MDSGW]**	J	1.9	U	1.75	U	1.6	U	1.7	U	**13.5 [PAL] [MDSGW]**	L	0.74	U	1.8	U
75-15-0	CARBON DISULFIDE	NA	19000	1.5	U	1.9	U	1.75	U	1.6	U	1.7	U	2.2	U	0.74	U	1.8	U
67-66-3	CHLOROFORM	NA	0.91	1.5	U	1.9	U	1.75	U	1.6	U	1.7	U	2.2	U	0.74	U	1.8	U
60-29-7	DIETHYL ETHER	NA	NA	1.5	U	1.9	U	1.75	U	1.6	U	1.7	U	2.2	U	0.74	U	1.8	U
75-09-2	METHYLENE CHLORIDE	NA	19	3.5	B	5.6	B	4.15	B	2.7	B	3.6	B	2.2	U	1.3	B	1.8	U
108-88-3	TOLUENE	140	100	129 [PAL] [BTAG]	J	1.9	U	1.75	U	1.6	U	1.7	U	0.77	J	0.74	U	1.8	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
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L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

				x04ss01002		x04ss01100		x04ss01102		x04ss01200		x04ss01202		x04ss01300		x04ss01302		x04ss01400		x04ss01402	
	nsample			X04SS0100024		X04SS0110006		X04SS0110024		X04SS0120006		X04SS0120024		X04SS0130006		X04SS0130024		X04SS0140006		X04SS0140024	
	location			X04SB010		X04SB011		X04SB011		X04SB012		X04SB012		X04SB013		X04SB013		X04SB014		X04SB014	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SS0100024		X04SS0110006		X04SS0110024		X04SS0120006		X04SS0120024		X04SS0130006		X04SS0130024		X04SS0140006		X04SS0140024	
	gis_date			20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			047		049		051		053		055		057		059		061		063	
cas	x	utl95cv	minorpal	c_047		c_049		c_051		c_053		c_055		c_057		c_059		c_061		c_063	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	19700	7700	**20400 [BKG] [PAL] [ORNL] [MDRES]**		11300 [PAL] [ORNL] [MDRES]		12500 [PAL] [ORNL] [MDRES]		16300 [PAL] [ORNL] [MDRES]		17000 [PAL] [ORNL] [MDRES]		12200 [PAL] [ORNL] [MDRES]		18100 [PAL] [ORNL] [MDRES]		19600 [PAL] [ORNL] [MDRES]		18100 [PAL] [ORNL] [MDRES]	
7440-36-0	**ANTIMONY**	NA	0.27	0.033	UJ	0.059	J	0.041	J	0.041	J	0.033	UJ	0.033	UJ	0.033	UJ	0.11	B	0.096	B
7440-38-2	ARSENIC	14.9	0.026	3.9 [PAL] [ORNL] [MDRES] [MDSGW]	K	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	1.7 [PAL] [ORNL] [MDRES] [MDSGW]	K	4 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	K	4.3 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	K
7440-39-3	BARIUM	80.4	330	75.4		37.9		54.4		58.1		73.6		47.4		43.1		74		81.3 [BKG]	
7440-41-7	BERYLLIUM	1.1	16	0.69	J	0.33	J	0.44	J	0.66	J	0.81	J	0.45	J	0.48	J	0.69	J	0.72	J
7440-43-9	CADMIUM	2.5	0.36	0.18	J	0.084	J	0.08	U	0.16	U	0.17	U	0.081	U	0.16	U	0.16	U	0.17	U
7440-70-2	CALCIUM	2060	NA	1140		301		220		287		264		572		323		159		193	
7440-47-3	CHROMIUM	33.4	26	28.8 [PAL] [SSL]		14.1		15.3		23.2		27.8 [PAL] [SSL]		16.5		18.2		21.9		19.1	
7440-48-4	COBALT	22.3	2.3	5.7 [PAL] [ORNL]		5 [PAL] [ORNL]		6.6 [PAL] [ORNL]		6.5 [PAL] [ORNL]		7.7 [PAL] [ORNL]		6.2 [PAL] [ORNL]		6.1 [PAL] [ORNL]		13.6 [PAL] [ORNL] [SSL]		15.2 [PAL] [ORNL] [SSL]	
7440-50-8	**COPPER**	20.3	28	14.5		7.6		7.3		**44.8 [BKG] [PAL] [SSL]**		**28.4 [BKG] [PAL] [SSL]**		10.7		11.1		12		9.1	
7439-89-6	IRON	38500	5500	30500 [PAL] [ORNL] [MDRES]		9790 [PAL] [ORNL] [MDRES]		10800 [PAL] [ORNL] [MDRES]		20000 [PAL] [ORNL] [MDRES]		20200 [PAL] [ORNL] [MDRES]		13700 [PAL] [ORNL] [MDRES]		16100 [PAL] [ORNL] [MDRES]		18400 [PAL] [ORNL] [MDRES]		16700 [PAL] [ORNL] [MDRES]	
7439-92-1	**LEAD**	62.5	11	23.9 [PAL] [SSL]	K	**119 [BKG] [PAL] [SSL]**	K	38.2 [PAL] [SSL]	K	26.5 [PAL] [SSL]	K	21.8 [PAL] [SSL]	K	33.1 [PAL] [SSL]	K	20 [PAL] [SSL]	K	26 [PAL] [SSL]		18.7 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	**28.3 [PAL] [ORNL] [OPLNT]**		**11.5 [PAL] [OPLNT]**		**13.8 [PAL] [OPLNT]**		**19.6 [PAL] [ORNL] [OPLNT]**		**20.7 [PAL] [ORNL] [OPLNT]**		**14.1 [PAL] [OPLNT]**		**14.9 [PAL] [OPLNT]**		**15 [PAL] [OPLNT]**		**13.8 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	1620	4400	1520		702		872		1500		1950 [BKG]		1100		1200		991		946	
7439-96-5	MANGANESE	1390	160	64		201 [PAL] [ORNL] [MDRES]		161 [PAL] [MDRES]		272 [PAL] [ORNL] [MDRES] [SSL]		198 [PAL] [ORNL] [MDRES]		310 [PAL] [ORNL] [MDRES] [SSL]		210 [PAL] [ORNL] [MDRES]		719 [PAL] [ORNL] [MDRES] [SSL]		702 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	**MERCURY**	0.16	0.058	0.046	J	0.038	J	0.028	J	0.043	J	0.031	J	0.041	J	0.04	J	0.068 [PAL] [BTAG]	J	0.045	J
7440-02-0	**NICKEL**	15.4	38	20.8 [BKG]		7.9		9.8		12.9		16 [BKG]		10.8		11.9		12.1		12.5	
7440-09-7	POTASSIUM	1470	NA	2230 [BKG]		1090		1360		2240 [BKG]		2610 [BKG]		1590 [BKG]		1140		1210		1020	
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	0.84	4.2	0.16	U	0.082	U	0.08	U	0.16	U	0.17	U	0.081	U	0.16	U	0.16	U	0.17	U
7440-23-5	SODIUM	120	NA	78.9		24.4	J	34.8		54.2		76		36.1		20.9	J	27.9	J	24.6	J
7440-24-6	STRONTIUM	NA	120	10.1		5.8		6.9		8.5		10.4		7.1		5.3		5.6		5.9	
7440-31-5	**TIN**	NA	0.89	**1.7 [PAL] [BTAG]**	J	0.82	U	0.81	U	1.6	U	1.7	U	0.82	U	1.6	U	1.6	U	1.7	U
7440-62-2	VANADIUM	53.3	7.8	43.1 [PAL] [ORNL] [MDRES] [SSL]	K	25.8 [PAL] [MDRES] [SSL]	K	25.3 [PAL] [MDRES] [SSL]	K	37.5 [PAL] [MDRES] [SSL]	K	38.4 [PAL] [MDRES] [SSL]	K	29.3 [PAL] [MDRES] [SSL]	K	29.6 [PAL] [MDRES] [SSL]	K	32.8 [PAL] [MDRES] [SSL]		27.7 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	**54.5 [BKG] [PAL] [SSL]**		25.3		29.1		**55.4 [BKG] [PAL] [SSL]**		**55.2 [BKG] [PAL] [SSL]**		40.4 [BKG]		42.3 [BKG]		45.2 [BKG]		39.1 [BKG]	
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA	21.4		19.8		16.9		22.9		20.9		21.6		21.6		29		21.7	
TTNUS002	PH (s.u.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	78.6		**80.2**		**83.1**		77.1		79.1		78.4		78.4		71		78.3	
	Volatile Organics (ug/kg)																				
71-43-2	**BENZENE**	NA	1.9	1.7	U	1.7	U	1.6	U	1.9	U	1.3	U	1.8	U	1.3	U	1.9	U	1.4	U
75-15-0	CARBON DISULFIDE	NA	19000	1.7	U	1.7	U	1.6	U	1.9	U	1.3	U	1.8	U	1.3	U	1.9	U	1.4	U
67-66-3	CHLOROFORM	NA	0.91	1.7	U	1.7	U	1.6	U	1.9	U	1.3	U	1.8	U	1.3	U	1.9	U	1.4	U
60-29-7	DIETHYL ETHER	NA	NA	1.7	U	1.7	U	1.6	U	1.9	U	1.3	U	1.8	U	1.3	U	1.9	U	1.4	U
75-09-2	METHYLENE CHLORIDE	NA	19	2.1	B	4.3	B	0.49	B	1.9	U	0.47	B	3.2	B	2.4	B	4.6	B	3.1	B
108-88-3	TOLUENE	140	100	1.7	U	1.7	U	1.7	B	1.9	U	1.3	U	1.8	U	1.3	U	1.9	U	1.4	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit
laboratory are reported in this manner. This qualifier is also added to a positive re

UJ – The analytical method could not detect the analyte at the sample specific de
inaccurate or imprecise based on validation review criteria. The associated nume

J –The chemical was present; however, the associated numerical result is not a p
sample. The laboratory reported concentration is an estimate of the true concent

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 6-4

SURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				x04ss01500		x04ss01502		x04ss01600		x04ss01602		x04ss01700		x04ss01702		x04ss01800		x04ss01802		x04ss01900	
	nsample			X04SS0150006		X04SS0150024		X04SS0160006		X04SS0160024		X04SS0170006		X04SS0170024		X04SS0180006		X04SS0180024		X04SS0190006	
	location			X04SB015		X04SB015		X04SB016		X04SB016		X04SB017		X04SB017		X04SB018		X04SB018		X04SB019	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SS0150006		X04SS0150024		X04SS0160006		X04SS0160024		X04SS0170006		X04SS0170024		X04SS0180006		X04SS0180024		X04SS0190006	
	gis_date			20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS		SS	
	z			065		067		069		071		073		075		077		079		081	
cas	x	utl95cv	minorpal	c_065		c_067		c_069		c_071		c_073		c_075		c_077		c_079		c_081	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.23	U	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U	0.25	U	0.25	U	0.24	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.23	U	0.25	U	0.25	U	0.25	U	0.25	U	0.23	U	0.25	U	0.25	U	0.24	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
99-99-0	4-NITROTOLUENE	0.21	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
2691-41-0	HMX	NA	380	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
55-63-0	NITROGLYCERIN	NA	0.61	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	0.43	J
78-11-5	PETN	NA	NA	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.19	U
	Inorganics (mg/kg)																				
7429-90-5	**ALUMINUM**	19700	7700	15600 [PAL] [ORNL] [MDRES]		16600 [PAL] [ORNL] [MDRES]		**20400 [BKG] [PAL] [ORNL] [MDRES]**		**19900 [BKG] [PAL] [ORNL] [MDRES]**		11500 [PAL] [ORNL] [MDRES]		12500 [PAL] [ORNL] [MDRES]		18100 [PAL] [ORNL] [MDRES]		18600 [PAL] [ORNL] [MDRES]		8240 [PAL] [ORNL] [MDRES]	
7440-36-0	**ANTIMONY**	NA	0.27	0.049	J	0.033	UJ	0.16	UJ	0.033	UJ	0.033	J	0.033	UJ	0.065	B	0.033	B	0.14	B
7440-38-2	ARSENIC	14.9	0.026	5.4 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	4.9 [PAL] [ORNL] [MDRES] [MDSGW]	K	4.9 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	K	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	K	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	K
7440-39-3	BARIUM	80.4	330	50.7		68.9		55.1		70.7		42.3		42.1		42.3		46.6		52.8	
7440-41-7	BERYLLIUM	1.1	16	0.7	J	0.84	J	0.92	J	1.1		0.43	J	0.48	J	0.43	J	0.49	J	0.36	J
7440-43-9	CADMIUM	2.5	0.36	0.16	U	0.16	U	0.19	J	0.17	U	0.083	U	0.082	U	0.16	U	0.082	U	0.23	J
7440-70-2	CALCIUM	2060	NA	336		269		331		335		454		312		334		275		35900 [BKG]	
7440-47-3	CHROMIUM	33.4	26	22.7		25.8		25.7		27.5 [PAL] [SSL]		18		15.8		18.1		18.9		15.2	
7440-48-4	COBALT	22.3	2.3	6.8 [PAL] [ORNL]		7.5 [PAL] [ORNL]		9.3 [PAL] [ORNL]		9.8 [PAL] [ORNL]		7.6 [PAL] [ORNL]		8.1 [PAL] [ORNL]		4.6 [PAL] [ORNL]		5.2 [PAL] [ORNL]		2.6 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	18.9		18.7		**89 [BKG] [PAL] [SSL]**		**41.2 [BKG] [PAL] [SSL]**		**37.9 [BKG] [PAL] [SSL]**		23.4 [BKG]		10.7		11.7		22.5 [BKG]	
7439-89-6	IRON	38500	5500	17800 [PAL] [ORNL] [MDRES]		17800 [PAL] [ORNL] [MDRES]		24100 [PAL] [ORNL] [MDRES]		23300 [PAL] [ORNL] [MDRES]		11900 [PAL] [ORNL] [MDRES]		14100 [PAL] [ORNL] [MDRES]		15100 [PAL] [ORNL] [MDRES]		13300 [PAL] [ORNL] [MDRES]		7250 [PAL] [ORNL] [MDRES]	
7439-92-1	**LEAD**	62.5	11	22.2 [PAL] [SSL]	K	19.5 [PAL] [SSL]	K	37.1 [PAL] [SSL]	K	18.7 [PAL] [SSL]	K	19.4 [PAL] [SSL]	K	19.1 [PAL] [SSL]	K	11.8 [PAL] [SSL]		13.8 [PAL] [SSL]		21 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	**19.4 [PAL] [ORNL] [OPLNT]**		**23.8 [PAL] [ORNL] [OPLNT]**		**22.9 [PAL] [ORNL] [OPLNT]**		**25.7 [PAL] [ORNL] [OPLNT]**		**12.2 [PAL] [OPLNT]**		**13.3 [PAL] [OPLNT]**		**15.9 [PAL] [OPLNT]**		**16.7 [PAL] [ORNL] [OPLNT]**		**4.4 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	1620	4400	1350		1740 [BKG]		1790 [BKG]		2090 [BKG]		1510		1090		994		1370		3460 [BKG]	
7439-96-5	MANGANESE	1390	160	180 [PAL] [MDRES]		119		309 [PAL] [ORNL] [MDRES] [SSL]		200 [PAL] [ORNL] [MDRES]		350 [PAL] [ORNL] [MDRES] [SSL]		294 [PAL] [ORNL] [MDRES] [SSL]		121		80.4		230 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	**MERCURY**	0.16	0.058	0.041	J	0.025	J	0.047	J	0.043	J	0.11 [PAL] [BTAG]	L	0.07 [PAL] [BTAG]	J	0.049	J	0.028	J	**0.57 [BKG] [PAL] [BTAG]**	J
7440-02-0	**NICKEL**	15.4	38	11.9		14.7		15		18.1 [BKG]		29.7 [BKG]		17.3 [BKG]		11		12.1		**63.6 [BKG] [PAL] [SSL]**	
7440-09-7	POTASSIUM	1470	NA	1890 [BKG]		2560 [BKG]		2070 [BKG]		2720 [BKG]		1340		1210		1560 [BKG]		1520 [BKG]		507	
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	0.84	4.2	0.16	U	0.16	U	0.16	U	0.17	U	0.083	U	0.082	U	0.16	U	0.082	U	0.79	
7440-23-5	SODIUM	120	NA	40.7	J	59.2		51		94		34		30.2		32.6	J	39.9		39.8	
7440-24-6	STRONTIUM	NA	120	8		10.4		9.5		11.9		7		6.1		6.4		7.2		49.1	
7440-31-5	**TIN**	NA	0.89	1.6	U	1.6	U	1.6	U	1.7	U	0.83	U	0.82	U	1.6	U	0.82	U	0.82	U
7440-62-2	VANADIUM	53.3	7.8	34.5 [PAL] [MDRES] [SSL]	K	37.6 [PAL] [MDRES] [SSL]	K	36.8 [PAL] [MDRES] [SSL]	K	36.8 [PAL] [MDRES] [SSL]	K	26 [PAL] [MDRES] [SSL]	K	24.8 [PAL] [MDRES] [SSL]	K	25.8 [PAL] [MDRES] [SSL]		26.8 [PAL] [MDRES] [SSL]		11.4 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	46	44.2 [BKG]		**48.4 [BKG] [PAL] [SSL]**		**54.5 [BKG] [PAL] [SSL]**		**63.9 [BKG] [PAL] [SSL]**		35.9		36.1		33.1		35.1		**63.4 [BKG] [PAL] [SSL]**	
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA	23.4		21.4		25.5		22.1		22.6		20.3		20		18.5		24.5	
TTNUS002	PH (s.u.)	8.8	NA																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA																		
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	76.6		78.6		74.5		77.9		77.4		79.7		**80**		**81.5**		75.5	
	Volatile Organics (ug/kg)																				
71-43-2	**BENZENE**	NA	1.9	1.9	U	0.9	J	1.7	U	1.9	U	0.51	J	1.4	U	**3 [PAL] [MDSGW]**		1.7	U	**3.5 [PAL] [MDSGW]**	
75-15-0	CARBON DISULFIDE	NA	19000	1.9	U	2.2	U	1.7	U	1.9	U	1.9	U	1.4	U	1.6	U	1.7	U	2.2	U
67-66-3	CHLOROFORM	NA	0.91	1.9	U	2.2	U	1.7	U	1.9	U	1.9	U	1.4	U	1.6	U	1.7	U	2.2	U
60-29-7	DIETHYL ETHER	NA	NA	1.9	U	2.2	U	1.7	U	1.9	U	1.9	U	1.4	U	1.6	U	1.7	U	2.2	U
75-09-2	METHYLENE CHLORIDE	NA	19	2.9	B	1.9	B	2.7	B	3.9	B	4.2	B	3.7	B	3.2	B	2.6	B	4.9	B
108-88-3	TOLUENE	140	100	0.88	B	2.2	U	1.7	U	20.9	B	1.9	U	1.4	U	1.5	B	1.7	U	3.5	B

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
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laboratory are reported in this manner. This qualifier is also added to a positive re

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L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

				x04ss01902		x04ss02000		x04ss02002	
	nsample			X04SS0190024		X04SS0200006		X04SS0200024	
	location			X04SB019		X04SB020		X04SB020	
	project_no			00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SS0190024		X04SS0200006		X04SS0200024	
	gis_date			20100317		20100317		20100317	
	qc_type			NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO	
	duplicate								
	top_depth			0.00		0.00		0.00	
	bottom_dep			2.00		0.50		2.00	
	depth_unit			FT		FT		FT	
	submatrix			SS		SS		SS	
	z			083		085		087	
cas	x	utl95cv	minorpal	c_083		c_085		c_087	
	Explosives (mg/kg)								
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.18	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.18	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.22	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.18	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.18	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.18	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.18	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.22	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.18	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.18	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.18	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.18	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.18	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	0.13	J	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.1	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.18	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.18	U	0.2	U	0.2	U
	Inorganics (mg/kg)								
7429-90-5	**ALUMINUM**	19700	7700	7780 [PAL] [ORNL]		10500 [PAL] [ORNL] [MDRES]		11800 [PAL] [ORNL] [MDRES]	
7440-36-0	**ANTIMONY**	NA	0.27	0.074	B	0.045	J	0.033	UJ
7440-38-2	ARSENIC	14.9	0.026	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	K	3 [PAL] [ORNL] [MDRES] [MDSGW]	K	3 [PAL] [ORNL] [MDRES] [MDSGW]	K
7440-39-3	BARIUM	80.4	330	28.9		34.6		56.1	
7440-41-7	BERYLLIUM	1.1	16	0.26	J	0.37	J	0.57	
7440-43-9	CADMIUM	2.5	0.36	0.082	U	0.083	U	0.082	U
7440-70-2	CALCIUM	2060	NA	11900 [BKG]		250		266	
7440-47-3	CHROMIUM	33.4	26	12		13.6		17	
7440-48-4	COBALT	22.3	2.3	3.4 [PAL] [ORNL]		9.8 [PAL] [ORNL]		10 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	28	**42.9 [BKG] [PAL] [SSL]**		27.2 [BKG]		13.7	
7439-89-6	IRON	38500	5500	6260 [PAL] [ORNL] [MDRES]		11100 [PAL] [ORNL] [MDRES]		12600 [PAL] [ORNL] [MDRES]	
7439-92-1	**LEAD**	62.5	11	15.2 [PAL] [SSL]		24.2 [PAL] [SSL]	K	14 [PAL] [SSL]	K
7439-93-2	**LITHIUM**	NA	2	**5.1 [PAL] [OPLNT]**		**11.8 [PAL] [OPLNT]**		**13.4 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	1620	4400	1570		831		970	
7439-96-5	MANGANESE	1390	160	93.9		282 [PAL] [ORNL] [MDRES] [SSL]		323 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	**MERCURY**	0.16	0.058	**0.52 [BKG] [PAL] [BTAG]**	J	0.10 [PAL] [BTAG]	L	0.047	J
7440-02-0	**NICKEL**	15.4	38	**84.4 [BKG] [PAL] [SSL]**		17.3 [BKG]		16.2 [BKG]	
7440-09-7	POTASSIUM	1470	NA	521		1130		1660 [BKG]	
7782-49-2	SELENIUM	1.2	0.52	0.16	UL	0.033	UL	0.16	UL
7440-22-4	SILVER	0.84	4.2	0.11	J	0.083	U	0.082	U
7440-23-5	SODIUM	120	NA	24	J	25.3		41.8	
7440-24-6	STRONTIUM	NA	120	19		5.6		7.3	
7440-31-5	**TIN**	NA	0.89	0.82	U	0.83	U	0.82	U
7440-62-2	VANADIUM	53.3	7.8	11.4 [PAL] [MDRES] [SSL]		29 [PAL] [MDRES] [SSL]	K	28.5 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	46	31.7		30.8		33.5	
	Miscellaneous								
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA						
TTNUS288	PERCENT MOISTURE (%)	NA	NA	16.9		23.9		18.5	
TTNUS002	PH (s.u.)	8.8	NA						
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA						
TTNUS048	**TOTAL SOLIDS (%)**	79.2	NA	**83.1**		76.1		**81.5**	
	Volatile Organics (ug/kg)								
71-43-2	**BENZENE**	NA	1.9	1.6	U	1.1	J	0.94	J
75-15-0	CARBON DISULFIDE	NA	19000	0.42	J	1.8	U	1.6	U
67-66-3	CHLOROFORM	NA	0.91	1.6	U	1.8	U	1.6	U
60-29-7	DIETHYL ETHER	NA	NA	1.6	U	1.8	U	1.6	U
75-09-2	METHYLENE CHLORIDE	NA	19	2.7	B	5.1	B	3.1	B
108-88-3	TOLUENE	140	100	1.6	U	3.4	B	0.83	B

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
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utl95cv - upper tolerance limit background calculation.
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actually present in the sample. The laboratory reported concentration
is an estimate of the true concentration and biased low.

TABLE 6-5

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

	nsample															X04SB0010204		X04SB0010406		X04SB0020204		X04SB0020406		X04SB0030204		X04SB0030406	
	location															X04SB001		X04SB001		X04SB002		X04SB002		X04SB003		X04SB003	
	project_no															00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc															X04SB0010204		X04SB0010406		X04SB0020204		X04SB0020406		X04SB0030204		X04SB0030406	
	gis_date															20100316		20100316		20100316		20100316		20100317		20100317	
	qc_type															NM		NM		NM		NM		NM		NM	
	sacode															NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix															SO		SO		SO		SO		SO		SO	
	duplicate																										
	top_depth															2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep															4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit															FT		FT		FT		FT		FT		FT	
	submatrix															SB		SB		SB		SB		SB		SB	
	z															001		003		005		007		009		011	
cas	x	utl95conv	minorpal	ornl	ornl_b	mdres	mdsqw	ssl	btag	opint	oinv	sunpl	sunin	lanl	ref	c_001		c_003		c_005		c_007		c_009		c_011	
	Explosives (mg/kg)																										
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	N	NA	NA	NA	NA	NA	NA	9	18	NC	Sunahara Plant	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	610	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	3.6	N	NA	NA	NA	NA	NA	NA	6	12	NC	ORNL-R	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	C	16	0.57	NA	NA	NA	NA	6	20	NC	MDE Cleanup Standard S-GW	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	N	7.8	0.25	NA	NA	NA	NA	5	7	NC	MDE Cleanup Standard S-GW	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	C	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	0.25	U	0.25	U	0.24	U	0.24	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	30	C	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
2691-41-0	HMX	NA	380	380	N	NA	NA	NA	NA	NA	NA	9341	600	NC	ORNL-R	0.20	UL	0.20	UL	0.19	UL	0.19	UL	0.20	U	0.20	U
98-95-3	NITROBENZENE	NA	0.023	4.8	C	3.9	0.023	NA	NA	NA	NA	40	NC	NC	MDE Cleanup Standard S-GW	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	5.5	C	NA	NA	NA	NA	NA	NA	9537	98	NC	ORNL-R	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
479-45-8	TETRYL	NA	24	24	N	NA	NA	NA	NA	NA	NA	NC	NC	25	ORNL-R	0.20	U	0.20	U	0.19	U	0.19	U	0.20	U	0.20	U
	Inorganics (mg/kg)																										
7429-90-5	ALUMINUM	35400	7700	7700	N	7800	NA	pH < 5.5	NC	NC	NC	NC	NC	NC	ORNL-R	26000 [PAL] [ORNL] [MDRES]		14200 [PAL] [ORNL] [MDRES]		23500 [PAL] [ORNL] [MDRES]		10000 [PAL] [ORNL] [MDRES]		11400 [PAL] [ORNL] [MDRES]		12000 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	3.1	N	3.1	13	0.27	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.033	UL	0.032	UL	0.033	UL	0.033	UL	0.033	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	0.39	C	0.43	0.026	18	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW	2.1 [PAL] [ORNL] [MDRES] [MDSGW]		2.5 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.7 [PAL] [ORNL] [MDRES] [MDSGW]		2.7 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	1500	N	1600	6000	330	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	95.9	K	52	K	41.9	K	34	K	44		44.4	
7440-41-7	BERYLLIUM	3.3	16	16	N	16	1200	21	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	0.74	J	0.53		0.29	J	0.39	J	0.56	J	0.50	
7440-43-9	CADMIUM	0.61	0.36	7	N	3.9	27	0.36	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.16	U	0.081	U	0.081	U	0.081	U	0.17	U	0.083	U
7440-70-2	CALCIUM	2590	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	154		126		86.9		53.2		67.9		98.6	
7440-47-3	CHROMIUM	60.1	26	12000	N	12000	2000000000	26	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	26.8 [PAL] [SSL]	K	15.4	K	13.9	K	12.5	K	16.5		16	
7440-48-4	COBALT	133	2.3	2.3	N	NA	NA	13	NC	NC	NC	NC	NC	NC	ORNL-R	6.2 [PAL] [ORNL]		5 [PAL] [ORNL]		1.7		3.4 [PAL] [ORNL]		4.6 [PAL] [ORNL]		3.6 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	310	N	310	11000	28	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	13.2		9.7		4.7		5.9		8.2		7.6	
7439-89-6	IRON	83100	5500	5500	N	5500	NA	pH<5 or >8	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	22200 [PAL] [ORNL] [MDRES]		17100 [PAL] [ORNL] [MDRES]		6860 [PAL] [ORNL] [MDRES]		12900 [PAL] [ORNL] [MDRES]		20700 [PAL] [ORNL] [MDRES]		15500 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	400		400	NA	11	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	10		9.7		4.9		5.7		7.2		7.6	
7439-93-2	**LITHIUM**	NA	2	16	N	NA	NA	NA	NA	2	NA	NC	NC	NC	ORNL Plant	**31.5 [PAL] [ORNL] [OPLNT]**		**15.3 [PAL] [OPLNT]**		**11.4 [PAL] [OPLNT]**		**10.8 [PAL] [OPLNT]**		**13 [PAL] [OPLNT]**		**13.3 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	NA		NA	NA	NA	4400	NC	NC	NC	NC	NC	R3BTAG	2070	K	1170	K	912	K	796	K	974		978	
7439-96-5	MANGANESE	4130	160	180	N	160	950	220	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	54.7		51.3		10.4		43.2		35.9		36.8	
7439-97-6	MERCURY	0.18	0.058	2.3	N	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	R3BTAG	0.0069	UL	0.0068	UL	0.007	UL	0.0069	UL	0.0069	UL	0.007	UL
7440-02-0	NICKEL	18.2	38	150	N	160	NA	38	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	16		11.8		6.4		7.9		11.2		9.7	
7440-09-7	POTASSIUM	2610	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	2790 [BKG]		1570		1580		1210		1500		1700	
7782-49-2	SELENIUM	13.3	0.52	39	N	39	19	0.52	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.033	UL	0.032	UL	0.16	UL	0.063	J	0.16	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	39	N	39	31	4.2	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.16	UL	0.081	UL	0.081	UL	0.081	UL	0.17	U	0.083	U
7440-23-5	SODIUM	258	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	97.6		51.9		52.9		35.4		47	J	59.3	
7440-24-6	STRONTIUM	NA	120	4700	N	NA	NA	NA	120	NC	NC	NC	NC	NC	R3BTAG	10.8		5.8		5.4		3.7		4.9		6	
7440-31-5	TIN	NA	0.89	4700	N	4700	NA	NA	0.89	NC	NC	NC	NC	NC	R3BTAG	1.7	UL	0.81	UL	0.82	UL	0.81	UL	1.7	U	0.83	U
7440-62-2	VANADIUM	194	7.8	39	N	7.8	730	7.8	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	39 [PAL] [MDRES] [SSL]	K	23.8 [PAL] [MDRES] [SSL]	K	19.2 [PAL] [MDRES] [SSL]	K	15.3 [PAL] [MDRES] [SSL]	K	19.2 [PAL] [MDRES] [SSL]		19.4 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	2300	N	2300	14000	46	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	43.2		31.9		15.5		24.2		30.4		24.7	
	Miscellaneous																										
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA												
TTNUS288	PERCENT MOISTURE (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17.8		15.1		18.2		17.2		18.1		17.4	
TTNUS002	PH (s.u.)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA												
TTNUS003	TOTAL ORGANIC CARBON m/g/kg)	66500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA												
TTNUS046	TOTAL SOLIDS (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	82.2		84.9		81.8		82.8		81.9		82.6	
	Volatile Organics (ug/kg)																										
71-43-2	**BENZENE**	NA	1.9	1100	C	12000	1.9	NA	100	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW	1.7	J	1.5	U	2.2	U	1.7	U	1.5	U	1.9	U
75-15-0	CARBON DISULFIDE	NA	19000	82000	N	780000	19000	NA	NA	NA	NA	NC	NC	NC	MDE Cleanup Standard S-GW	1.8	U	1.5	U	2.2	U	1.7	U	1.5	U	1.9	U
67-66-3	CHLOROFORM	NA	0.91	290	C	78000	0.91	NA	300	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW	1.8	U	1.5	U	2.2	U	1.7	U	1.5	U	1.9	U
60-29-7	DIETHYL ETHER	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA		1.8	U	1.5	U	2.2	U	1.7	U	1.5	U	1.9	U
75-09-2	METHYLENE CHLORIDE	NA	19	11000	C	85000	19	NA	300	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW	1.8	U	1.5	U	1.9	J	1.7	U	2.3	B	3.8	B
108-88-3	TOLUENE	NA	100	500000	N	630000	27000	NA	100	NC	NC	NC	NC	NC	R3BTAG	1.8	U	0.97	J	3.5		1.2	J	1.5	U	1.9	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading (ND)
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

cas	x	utl95conv	minorpal	c_013		c_015		c_017		c_019		c_021		c_023		c_025		c_026		c_028	
	nsample			X04SB0040204		X04SB0040406		X04SB0050204		X04SB0050406		X04SB0060204		X04SB0060406		X04SB0070204		X04SB0070204-AVG		X04SB0070204-D	
	location			X04SB004		X04SB004		X04SB005		X04SB005		X04SB006		X04SB006		X04SB007		X04SB007		X04SB007	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SB0040204		X04SB0040406		X04SB0050204		X04SB0050406		X04SB0060204		X04SB0060406		X04SB0070204		X04SB0070204-AVG		FD031610-02	
	gis_date			20100316		20100316		20100316		20100316		20100316		20100316		20100316		20100316		20100316	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		FD	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																			X04SB0070204	
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		2.00		2.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		4.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			013		015		017		019		021		023		025		026		028	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.245	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.245	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
2691-41-0	HMX	NA	380	0.20	UL	0.20	UL	0.20	UL	0.19	UL	0.20	UL	0.20	UL	0.19	UL	0.195	UL	0.20	UL
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.1	U	1.15	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.1	U	1.15	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
479-45-8	TETRYL	NA	24	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.19	U	0.195	U	0.20	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	35400	7700	34100 [PAL] [ORNL] [MDRES]		23900 [PAL] [ORNL] [MDRES]		16100 [PAL] [ORNL] [MDRES]		23100 [PAL] [ORNL] [MDRES]		18100 [PAL] [ORNL] [MDRES]		21000 [PAL] [ORNL] [MDRES]		32200 [PAL] [ORNL] [MDRES]	J	24550 [PAL] [ORNL] [MDRES]	J	16900 [PAL] [ORNL] [MDRES]	J
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.032	UL	0.033	UL	0.032	UL	0.032	UL	0.032	UL	0.032	UL	0.032	UL	0.032	UL
7440-38-2	ARSENIC	18.9	0.026	3.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		4.5 [PAL] [ORNL] [MDRES] [MDSGW]		2.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]		2.5 [PAL] [ORNL] [MDRES] [MDSGW]		2.3 [PAL] [ORNL] [MDRES] [MDSGW]		2.55 [PAL] [ORNL] [MDRES] [MDSGW]		2.8 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	100	K	60.9	K	29.7	K	58.3	K	18.2	K	45.3	K	31.8	K	41.8	K	51.8	K
7440-41-7	BERYLLIUM	3.3	16	0.93	J	0.48	J	0.41	J	0.56	J	0.19	J	0.47	J	0.33	J	0.415	J	0.50	J
7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.081	U	0.08	U	0.16	U	0.082	U	0.16	U	0.083	U	0.1215	U	0.16	U
7440-70-2	CALCIUM	2590	NA	76.1		63		35.2		52.5		41.2		115		75.9		96.45		117	
7440-47-3	CHROMIUM	60.1	26	28.4 [PAL] [SSL]	K	16.1	K	12.4	K	19.6	K	7	K	19.1	K	12.6	K	15.95	K	19.3	
7440-48-4	COBALT	133	2.3	8.7 [PAL] [ORNL]		4.9 [PAL] [ORNL]		3.4 [PAL] [ORNL]		5 [PAL] [ORNL]		1.9		2.4 [PAL] [ORNL]	L	2.8 [PAL] [ORNL]		3.3 [PAL] [ORNL]		3.8 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	13.6		7.7		6.1		10.8		3.4		8.6		6		7.25		8.5	
7439-89-6	IRON	83100	5500	29000 [PAL] [ORNL] [MDRES]		13000 [PAL] [ORNL] [MDRES]		18900 [PAL] [ORNL] [MDRES]		20800 [PAL] [ORNL] [MDRES]		8050 [PAL] [ORNL] [MDRES]		20400 [PAL] [ORNL] [MDRES]		12900 [PAL] [ORNL] [MDRES]		15200 [PAL] [ORNL] [MDRES]		17500 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	14.3 [PAL] [SSL]		6.1		4.2	L	7		2.7		7.6		5.9		7.15		8.4	
7439-93-2	**LITHIUM**	NA	2	**31.2 [PAL] [ORNL] [OPLNT]**		**14.7 [PAL] [OPLNT]**		**9.7 [PAL] [OPLNT]**		**15.7 [PAL] [OPLNT]**		**7.9 [PAL] [OPLNT]**		**14.3 [PAL] [OPLNT]**		**11.8 [PAL] [OPLNT]**		**14.45 [PAL] [OPLNT]**		**17.1 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	2110	K	1240	K	646	K	1420	K	484	K	901	K	772	K	941	K	1110	K
7439-96-5	MANGANESE	4130	160	87.7		49.7		78.2		95.4		24.2		40.4		50.3		46.15		42	
7439-97-6	MERCURY	0.18	0.058	0.027	J	0.0068	UL	0.007	UL	0.0068	UL	0.0069	UL	0.0099	J	0.019	J	0.025	J	0.031	J
7440-02-0	NICKEL	18.2	38	18.6 [BKG]		10.8		7.8	K	12.9		4.9		8.5	K	7.4		9		10.6	
7440-09-7	POTASSIUM	2610	NA	2850 [BKG]		1660		811		1500		516		1860		906	J	1338	J	1770	J
7782-49-2	SELENIUM	13.3	0.52	0.086	J	0.032	UL	0.083	J	0.032	UL	0.032	UL	0.034	J	0.032	UL	0.096	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.16	UL	0.081	UL	0.08	UL	0.16	UL	0.082	UL	0.16	UL	0.083	UL	0.1215	UL	0.16	UL
7440-23-5	SODIUM	258	NA	99.2		68.9		28.8		65.2		10.6	J	46.1	J	21	J	31.5	J	42	J
7440-24-6	STRONTIUM	NA	120	9.6		6		2.9	K	5.6		2.1		6.8		4.2	J	5.7	J	7.2	J
7440-31-5	TIN	NA	0.89	1.6	UL	0.81	UL	0.80	UL	1.6	UL	0.83	UL	1.6	UL	0.83	UL	1.215	UL	1.6	UL
7440-62-2	VANADIUM	194	7.8	38.9 [PAL] [MDRES] [SSL]	K	23.9 [PAL] [MDRES] [SSL]	K	13.7 [PAL] [MDRES] [SSL]	K	26 [PAL] [MDRES] [SSL]	K	9.8 [PAL] [MDRES] [SSL]	K	24.6 [PAL] [MDRES] [SSL]	K	17.9 [PAL] [MDRES] [SSL]	K	22.35 [PAL] [MDRES] [SSL]	K	26.8 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	70.4	46	50.2 [PAL] [SSL]		27.1		21.3		31.5		16		22.9		21.1		25.7		30.3	
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA	17.4		14.6		15.2		17.7		16.3		18.9		18.2		19.35		20.5	
TTNUS002	PH (s.u.)	NA	NA																		
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA																		
TTNUS046	TOTAL SOLIDS (%)	NA	NA	82.6		85.4		84.8		82.3		83.7		81.1		81.8		80.65		79.5	
	Volatile Organics (ug/kg)																				
71-43-2	**BENZENE**	NA	1.9	1.8	U	1.6	U	1.7	U	1.9	U	1.6	U	**2.8 [PAL] [MDSGW]**		1.4	U	1.45	U	1.5	U
75-15-0	CARBON DISULFIDE	NA	19000	1.8	U	1.6	U	1.7	U	1.9	U	1.6	U	1.4	U	1.4	U	1.45	U	1.5	U
67-66-3	CHLOROFORM	NA	0.91	1.8	U	1.6	U	1.7	U	1.9	U	1.6	U	1.4	U	1.4	U	1.45	U	1.5	U
60-29-7	DIETHYL ETHER	NA	NA	1.8	U	1.6	U	1.7	U	1.9	U	1.6	U	1.4	U	1.4	U	1.45	U	1.5	U
75-09-2	METHYLENE CHLORIDE	NA	19	2.1	K	1.6	U	1.7	U	1.9	U	1.6	U	1.4	U	1.4	U	1.45	U	1.5	U
108-88-3	TOLUENE	NA	100	1.8	U	1.6	U	1.7	U	1.9	U	1.6	U	8		1.4	U	0.64	J	0.64	J

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indi
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit
reported in this manner. This qualifier is also added to a positive result (reported

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laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 6-5

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

	nsample			X04SB0070406		X04SB0080204		X04SB0080406		X04SB0090204		X04SB0090406	
	location			X04SB007		X04SB008		X04SB008		X04SB009		X04SB009	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SB0070406		X04SB0080204		X04SB0080406		X04SB0090204		X04SB0090406	
	gis_date			20100316		20100316		20100316		20100316		20100316	
	qc_type			NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		ORIG	
	matrix			SO		SO		SO		SO		SO	
	duplicate												
	top_depth			4.00		2.00		4.00		2.00		4.00	
	bottom_dep			6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB	
	z			031		033		035		037		039	
cas	x	utl95conv	minorpal	c_031		c_033		c_035		c_037		c_039	
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
2691-41-0	HMX	NA	380	0.20	UL	0.20	UL	0.20	UL	0.20	UL	0.20	UL
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
479-45-8	TETRYL	NA	24	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
	Inorganics (mg/kg)												
7429-90-5	ALUMINUM	35400	7700	19700 [PAL] [ORNL] [MDRES]		9410 [PAL] [ORNL] [MDRES]		15200 [PAL] [ORNL] [MDRES]		20000 [PAL] [ORNL] [MDRES]		21300 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.033	UL	0.032	UL	0.033	UL	0.032	UL
7440-38-2	ARSENIC	18.9	0.026	2.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.3 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		6.3 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	29.4	K	54.1	K	52.1	K	32.7	K	57.3	K
7440-41-7	BERYLLIUM	3.3	16	0.31	J	0.53		0.55		0.37	J	0.54	J
7440-43-9	CADMIUM	0.61	0.36	0.081	U	0.08	U	0.081	U	0.082	U	0.083	U
7440-70-2	CALCIUM	2590	NA	55.4		151		137		58.8		118	
7440-47-3	CHROMIUM	60.1	26	12.7	K	17.5	K	23.6	K	14.1	K	22.3	K
7440-48-4	COBALT	133	2.3	2.2		7.3 [PAL] [ORNL]		2.8 [PAL] [ORNL]		3.9 [PAL] [ORNL]		3.5 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	6.4		7.4		12.1		7.2		11.1	
7439-89-6	IRON	83100	5500	12200 [PAL] [ORNL] [MDRES]		15500 [PAL] [ORNL] [MDRES]		14100 [PAL] [ORNL] [MDRES]		15100 [PAL] [ORNL] [MDRES]		12900 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	6		8.6		10.6		6.6		10.1	
7439-93-2	**LITHIUM**	NA	2	**11.8 [PAL] [OPLNT]**		**16.3 [PAL] [ORNL] [OPLNT]**		**21.2 [PAL] [ORNL] [OPLNT]**		**13.4 [PAL] [OPLNT]**		**20.1 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	706	K	1140	K	1350	K	823	K	1460	K
7439-96-5	MANGANESE	4130	160	36.6		145		25.3		26.1		29.2	
7439-97-6	MERCURY	0.18	0.058	0.019	J	0.01	J	0.015	J	0.034	J	0.023	J
7440-02-0	NICKEL	18.2	38	6.6		11.9		10.6		9.6		11.1	
7440-09-7	POTASSIUM	2610	NA	901		1500		1580		953		2070	
7782-49-2	SELENIUM	13.3	0.52	0.032	UL	0.033	UL	0.032	UL	0.033	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.081	UL	0.08	UL	0.081	UL	0.082	UL	0.083	UL
7440-23-5	SODIUM	258	NA	26.8		52.6		78.7		27.8		109	
7440-24-6	STRONTIUM	NA	120	3.8		6.8		7.5		4.1		7.9	
7440-31-5	TIN	NA	0.89	0.81	UL	0.80	UL	0.81	UL	0.82	UL	0.83	UL
7440-62-2	VANADIUM	194	7.8	18.3 [PAL] [MDRES] [SSL]	K	26.3 [PAL] [MDRES] [SSL]	K	26.5 [PAL] [MDRES] [SSL]	K	19.7 [PAL] [MDRES] [SSL]	K	31.4 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	70.4	46	20		32.8		32.5		28.6		32.4	
	Miscellaneous												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA			36.4	J	37.5	J				
TTNUS288	PERCENT MOISTURE (%)	NA	NA	19.9		18.1		19.3		18.8		17.2	
TTNUS002	PH (s.u.)	NA	NA			5.3		4.61					
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA			777	J	585	UL				
TTNUS046	TOTAL SOLIDS (%)	NA	NA	80.1		81.9		80.7		81.2		82.8	
	Volatile Organics (ug/kg)												
71-43-2	**BENZENE**	NA	1.9	1.5	UJ	**6.3 [PAL] [MDSGW]**		1.6	U	1.9 [MDSGW] [BTAG]	J	1.7	U
75-15-0	CARBON DISULFIDE	NA	19000	1.5	UJ	1.6	U	1.6	U	1.9	U	1.7	U
67-66-3	CHLOROFORM	NA	0.91	1.5	UJ	1.6	U	1.6	U	1.9	U	1.7	U
60-29-7	DIETHYL ETHER	NA	NA	1.5	UJ	1.6	U	1.6	U	1.9	U	1.7	U
75-09-2	METHYLENE CHLORIDE	NA	19	1.6	J	1.9	K	0.74	J	1.9	U	1.7	U
108-88-3	TOLUENE	NA	100	1.5	UJ	0.47	J	1.6	U	1.9	U	1.7	U

	nsample	X04SB0090406-AVG		X04SB0090406-D		X04SB0100204		X04SB0100406	
	location	X04SB009		X04SB009		X04SB010		X04SB010	
	project_no	00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc	X04SB0090406-AVG		FD031610-03		X04SB0100204		X04SB0100406	
	gis_date	20100316		20100316		20100316		20100316	
	qc_type	NM		FD		NM		NM	
	sacode	AVG		DUP		NORMAL		NORMAL	
	matrix	SO		SO		SO		SO	
	duplicate			X04SB0090406					
	top_depth	4.00		4.00		2.00		4.00	
	bottom_dep	6.00		6.00		4.00		6.00	
	depth_unit	FT		FT		FT		FT	
	submatrix	SB		SB		SB		SB	
	z	040		042		045		047	
cas	x	c_040		c_042		c_045		c_047	
	Explosives (mg/kg)								
99-35-4	1,3,5-TRINITROBENZENE	0.20	U	0.20	U	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.20	U	0.20	U	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	0.20	U	0.20	U	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	0.20	U	0.20	U	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	0.20	U	0.20	U	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	0.20	U	0.20	U	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	0.20	U	0.20	U	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	0.20	U	0.20	U	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	0.20	U	0.20	U	0.20	U	0.20	U
2691-41-0	HMX	0.20	UL	0.20	UL	0.20	UL	0.20	UL
98-95-3	NITROBENZENE	0.20	U	0.20	U	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	0.20	U	0.20	U	0.20	U	0.20	U
479-45-8	TETRYL	0.20	U	0.20	U	0.20	U	0.20	U
	Inorganics (mg/kg)								
7429-90-5	ALUMINUM	20750 [PAL] [ORNL] [MDRES]		20200 [PAL] [ORNL] [MDRES]		7310		16100 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	0.032	UL	0.032	UL	0.032	UL	0.033	UL
7440-38-2	ARSENIC	5.05 [PAL] [ORNL] [MDRES] [MDSGW]		3.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.7 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	61.8	K	66.3	K	13.3	K	44	K
7440-41-7	BERYLLIUM	0.585		0.63		0.23	J	0.54	J
7440-43-9	CADMIUM	0.0825	U	0.082	U	0.081	U	0.17	U
7440-70-2	CALCIUM	123.5		129		22		481	
7440-47-3	CHROMIUM	25.5	K	28.7 [PAL] [SSL]		6.5	K	20.1	
7440-48-4	COBALT	3.9 [PAL] [ORNL]		4.3 [PAL] [ORNL]		1.9		4.4 [PAL] [ORNL]	
7440-50-8	COPPER	11.95		12.8		3.8		10.3	
7439-89-6	IRON	13300 [PAL] [ORNL] [MDRES]		13700 [PAL] [ORNL] [MDRES]		10100 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	10.6		11.1 [PAL] [SSL]		3.2		13 [PAL] [SSL]	
7439-93-2	**LITHIUM**	**22.25 [PAL] [ORNL] [OPLNT]**		**24.4 [PAL] [ORNL] [OPLNT]**		**5 [PAL] [OPLNT]**		**15.7 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	1590	K	1720	K	328	K	1160	K
7439-96-5	MANGANESE	32.6		36		14.4		55.5	
7439-97-6	MERCURY	0.0215	J	0.02	J	0.0069	UL	0.017	J
7440-02-0	NICKEL	12		12.9		4.4	K	13.1	
7440-09-7	POTASSIUM	2050		2030		386		1450	
7782-49-2	SELENIUM	0.16	UL	0.16	UL	0.032	UL	0.16	UL
7440-22-4	SILVER	0.0825	UL	0.082	UL	0.081	UL	0.17	UL
7440-23-5	SODIUM	116		123		17.2	J	60.5	
7440-24-6	STRONTIUM	8.2		8.5		1.5	K	7	
7440-31-5	TIN	0.83	UL	0.83	UL	0.81	UL	1.7	U
7440-62-2	VANADIUM	30.85 [PAL] [MDRES] [SSL]	K	30.3 [PAL] [MDRES] [SSL]	K	7.7	K	26.4 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	34.25		36.1		12.5		32.5	
	Miscellaneous								
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)								
TTNUS288	PERCENT MOISTURE (%)	17.5		17.8		15.8		19.4	
TTNUS002	PH (s.u.)								
TTNUS003	TOTAL ORGANIC CARBON mg/kg)								
TTNUS046	TOTAL SOLIDS (%)	82.5		82.2		84.2		80.6	
	Volatile Organics (ug/kg)								
71-43-2	**BENZENE**	1.75	U	1.8	U	1.4	U	1.4	U
75-15-0	CARBON DISULFIDE	1.75	U	1.8	U	1.4	U	1.4	U
67-66-3	CHLOROFORM	1.75	U	1.8	U	1.4	U	1.4	U
60-29-7	DIETHYL ETHER	1.75	U	1.8	U	1.4	U	1.4	U
75-09-2	METHYLENE CHLORIDE	1.75	U	1.8	U	3.2		1.9	
108-88-3	TOLUENE	1.75	U	1.8	U	1.4	U	1.4	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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TABLE 6-5

SUBSURFACE SOIL SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL AIR STATION
INDIAN HEAD, MARYLAND

	nsample			X04SB0110204		X04SB0110406		X04SB0120204		X04SB0120406		X04SB0130204		X04SB0130406		X04SB0140204		X04SB0140406		X04SB0150204	
	location			X04SB011		X04SB011		X04SB012		X04SB012		X04SB013		X04SB013		X04SB014		X04SB014		X04SB015	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SB0110204		X04SB0110406		X04SB0120204		X04SB0120406		X04SB0130204		X04SB0130406		X04SB0140204		X04SB0140406		X04SB0150204	
	gis_date			20100316		20100316		20100317		20100317		20100317		20100317		20100316		20100316		20100317	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			049		051		053		055		057		059		061		063		065	
cas	x	utl95conv	minorpal	c_049		c_051		c_053		c_055		c_057		c_059		c_061		c_063		c_065	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
2691-41-0	HMX	NA	380	0.20	UL	0.20	UL	0.19	U	0.20	U	0.20	U	0.20	U	0.20	UL	0.20	UL	0.20	U
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
479-45-8	TETRYL	NA	24	0.20	U	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	35400	7700	18300 [PAL] [ORNL] [MDRES]		20500 [PAL] [ORNL] [MDRES]		21200 [PAL] [ORNL] [MDRES]		14600 [PAL] [ORNL] [MDRES]		19100 [PAL] [ORNL] [MDRES]		13900 [PAL] [ORNL] [MDRES]		22700 [PAL] [ORNL] [MDRES]		7420		21700 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.032	UL	0.16	UL	0.16	UL	0.033	UL	0.033	UL	0.032	UL	0.032	UL	0.16	UL
7440-38-2	ARSENIC	18.9	0.026	1.5 [PAL] [ORNL] [MDRES] [MDSGW]		6.2 [PAL] [ORNL] [MDRES] [MDSGW]		0.68 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]		2.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]		4.1 [PAL] [ORNL] [MDRES] [MDSGW]		1.4 [PAL] [ORNL] [MDRES] [MDSGW]		4.4 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	34	K	63.7	K	92.1		77.8		70.8		42.9		72.9	K	56.5	K	94.2	
7440-41-7	BERYLLIUM	3.3	16	0.42	J	0.65	J	0.85		0.99	J	0.71	J	0.42	J	0.75	J	0.66		1.4	
7440-43-9	CADMIUM	0.61	0.36	0.081	U	0.16	U	0.082	U	0.17	U	0.16	U	0.083	U	0.16	U	0.082	U	0.16	U
7440-70-2	CALCIUM	2590	NA	114		151		362		282		233		148		409		92.5		304	
7440-47-3	CHROMIUM	60.1	26	18.7	K	27.8 [PAL] [SSL]		24.3		29.1 [PAL] [SSL]		22.9		14.3		29.2 [PAL] [SSL]	K	18	K	28.6 [PAL] [SSL]	
7440-48-4	COBALT	133	2.3	2.9 [PAL] [ORNL]	L	4.8 [PAL] [ORNL]		21.1 [PAL] [ORNL] [SSL]		26.1 [PAL] [ORNL] [SSL]		6.2 [PAL] [ORNL]		4 [PAL] [ORNL]		29.6 [PAL] [ORNL] [SSL]		6.2 [PAL] [ORNL]		15.3 [PAL] [ORNL] [SSL]	
7440-50-8	COPPER	48.6	28	10.5		14.1		10.7		13		10.3		4.8		7.3		8.2		15.1	
7439-89-6	IRON	83100	5500	17500 [PAL] [ORNL] [MDRES]		17500 [PAL] [ORNL] [MDRES]		13700 [PAL] [ORNL] [MDRES]		33200 [PAL] [ORNL] [MDRES]		18800 [PAL] [ORNL] [MDRES]		11600 [PAL] [ORNL] [MDRES]		25200 [PAL] [ORNL] [MDRES]		16900 [PAL] [ORNL] [MDRES]		30500 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	9.7		12.3 [PAL] [SSL]		12.3 [PAL] [SSL]		14.9 [PAL] [SSL]		10.1		11		16.6 [PAL] [SSL]		9.7		18.9 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	**15.5 [PAL] [OPLNT]**		**25.6 [PAL] [ORNL] [OPLNT]**		**29.7 [PAL] [ORNL] [OPLNT]**		**17.4 [PAL] [ORNL] [OPLNT]**		**27.8 [PAL] [ORNL] [OPLNT]**		**14.2 [PAL] [OPLNT]**		**22.6 [PAL] [ORNL] [OPLNT]**		**20.6 [PAL] [ORNL] [OPLNT]**		**31.6 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1070	K	1810	K	1950		1460		1860		1300		1890	K	1390	K	2420	
7439-96-5	MANGANESE	4130	160	42.7		41.1		130		247 [PAL] [ORNL] [MDRES] [SSL]		50.1		47.6		556 [PAL] [ORNL] [MDRES] [SSL]		54.2		135	
7439-97-6	MERCURY	0.18	0.058	0.018	J	0.038	J	0.034	UL	0.035	UL	0.007	UL	0.0069	UL	0.032	J	0.0068	UL	0.035	UL
7440-02-0	NICKEL	18.2	38	9.7		13.1		25.3 [BKG]		20.7 [BKG]		17.4		10		18.6 [BKG]		14.2		23.8 [BKG]	
7440-09-7	POTASSIUM	2610	NA	1380		2360		1910		1380		1800		1320		1650		1590		2690 [BKG]	
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.032	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.081	UL	0.16	UL	0.082	U	0.17	U	0.16	U	0.083	U	0.16	UL	0.082	UL	0.16	U
7440-23-5	SODIUM	258	NA	36		69		460 [BKG]		427 [BKG]		332 [BKG]		78.9		57.4		74.9		226	
7440-24-6	STRONTIUM	NA	120	5.9		9.3		12.4		8.3		10		7.9		9.6		6.9		11.9	
7440-31-5	TIN	NA	0.89	0.82	UL	1.6	U	0.82	U	1.7	U	1.6	U	0.83	U	1.6	UL	0.82	UL	1.6	U
7440-62-2	VANADIUM	194	7.8	24.5 [PAL] [MDRES] [SSL]	K	36.2 [PAL] [MDRES] [SSL]	K	31.9 [PAL] [MDRES] [SSL]		27.1 [PAL] [MDRES] [SSL]		29.5 [PAL] [MDRES] [SSL]		20.5 [PAL] [MDRES] [SSL]		42.9 [PAL] [ORNL] [MDRES] [SSL]	K	29.3 [PAL] [MDRES] [SSL]	K	37.3 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	27.4		38.5		**80.5 [BKG] [PAL] [SSL]**		61 [PAL] [SSL]		41.4		24.5		60.6 [PAL] [SSL]		43.1		**71.4 [BKG] [PAL] [SSL]**	
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA	17.1		18.8		16.7		15.5		13.9		13		18.5		16.1		20.1	
TTNUS002	PH (s.u.)	NA	NA																		
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA																		
TTNUS046	TOTAL SOLIDS (%)	NA	NA	82.9		81.2		83.3		84.5		86.1		87		81.5		83.9		79.9	
	Volatile Organics (ug/kg)																				
71-43-2	**BENZENE**	NA	1.9	**5.8 [PAL] [MDSGW]**	J	1.6	U	**9 [PAL] [MDSGW]**		1.8	U	**2.2 [PAL] [MDSGW]**		**14 [PAL] [MDSGW]**		1.6	U	1.7	U	1.7	U
75-15-0	CARBON DISULFIDE	NA	19000	1.5	U	1.6	U	1.8	U	1.8	U	1.5	U	1.4	U	1.6	U	1.7	U	1.7	U
67-66-3	CHLOROFORM	NA	0.91	1.5	U	1.6	U	1.8	U	1.8	U	1.5	U	1.4	U	1.6	U	1.7	U	1.7	U
60-29-7	DIETHYL ETHER	NA	NA	1.5	U	1.6	U	1.8	U	1.8	U	1.5	U	1.4	U	1.6	U	1.7	U	1.7	U
75-09-2	METHYLENE CHLORIDE	NA	19	1.5	U	1.1	J	1.3	B	0.69	B	2.5	B	1.7	B	1.6	U	1.7	U	1.1	B
108-88-3	TOLUENE	NA	100	14.6	J	1.6	U	7.1	B	3	B	1.5	U	24.3	B	1.6	U	1.7	U	1.7	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indi
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit
reported in this manner. This qualifier is also added to a positive result (reported

UJ – The analytical method could not detect the analyte at the sample specific de
imprecise based on validation review criteria. The associated numerical detectior

J –The chemical was present; however, the associated numerical result is not a p
laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

	nsample			X04SB0150406		X04SB0160204		X04SB0160406		X04SB0170204		X04SB0170406		X04SB0180204		X04SB0180406		X04SB0190204		X04SB0190406	
	location			X04SB015		X04SB016		X04SB016		X04SB017		X04SB017		X04SB018		X04SB018		X04SB019		X04SB019	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X04SB0150406		X04SB0160204		X04SB0160406		X04SB0170204		X04SB0170406		X04SB0180204		X04SB0180406		X04SB0190204		X04SB0190406	
	gis_date			20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317		20100317	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				
	top_depth			4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			067		069		071		073		075		077		079		081		083	
cas	x	utl95conv	minorpal	c_067		c_069		c_071		c_073		c_075		c_077		c_079		c_081		c_083	
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
2691-41-0	HMX	NA	380	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
479-45-8	TETRYL	NA	24	0.20	U	0.19	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	35400	7700	19800 [PAL] [ORNL] [MDRES]		11900 [PAL] [ORNL] [MDRES]		8790 [PAL] [ORNL] [MDRES]		18500 [PAL] [ORNL] [MDRES]		11100 [PAL] [ORNL] [MDRES]		24700 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]		24500 [PAL] [ORNL] [MDRES]		23700 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.16	UL	0.033	UJ	0.033	UJ	0.033	UL	0.033	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-38-2	ARSENIC	18.9	0.026	0.83 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]	K	0.83 [PAL] [ORNL] [MDRES] [MDSGW]	K	1.2 [PAL] [ORNL] [MDRES] [MDSGW]		5.4 [PAL] [ORNL] [MDRES] [MDSGW]		5.3 [PAL] [ORNL] [MDRES] [MDSGW]		1.9 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		1.3 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	94.2		68.4		64.6		59.9		54.6		81.3		82.2		82.6		70.7	
7440-41-7	BERYLLIUM	3.3	16	1		1.1		1.3		0.80	J	0.62		1.1		1		0.83	J	0.99	
7440-43-9	CADMIUM	0.61	0.36	0.17	U	0.30	J	0.16	U	0.16	U	0.083	U	0.16	U	0.16	U	0.17	U	0.16	U
7440-70-2	CALCIUM	2590	NA	657		418		374		179		120		288		524		233		263	
7440-47-3	CHROMIUM	60.1	26	27.3 [PAL] [SSL]		26.6 [PAL] [SSL]		18.1		20.9		18.9		29.5 [PAL] [SSL]		27.9 [PAL] [SSL]		29.6 [PAL] [SSL]		26	
7440-48-4	COBALT	133	2.3	23.7 [PAL] [ORNL] [SSL]		11.6 [PAL] [ORNL]		20 [PAL] [ORNL] [SSL]		8.6 [PAL] [ORNL]		6.1 [PAL] [ORNL]		10.2 [PAL] [ORNL]		24.3 [PAL] [ORNL] [SSL]		10.8 [PAL] [ORNL]		9.3 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	13.2		14.4		12.1		12.4		7		16.1		10.1		10.9		12.5	
7439-89-6	IRON	83100	5500	23600 [PAL] [ORNL] [MDRES]		22000 [PAL] [ORNL] [MDRES]		17500 [PAL] [ORNL] [MDRES]		16100 [PAL] [ORNL] [MDRES]		14200 [PAL] [ORNL] [MDRES]		22200 [PAL] [ORNL] [MDRES]		18400 [PAL] [ORNL] [MDRES]		23000 [PAL] [ORNL] [MDRES]		21000 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	11		11.3 [PAL] [SSL]	K	9.5	K	9		6.8		16.5 [PAL] [SSL]		11.3 [PAL] [SSL]		15.2 [PAL] [SSL]		10.2	
7439-93-2	**LITHIUM**	NA	2	**24.4 [PAL] [ORNL] [OPLNT]**		**27.3 [PAL] [ORNL] [OPLNT]**		**17.9 [PAL] [ORNL] [OPLNT]**		**18.6 [PAL] [ORNL] [OPLNT]**		**12.8 [PAL] [OPLNT]**		**28.9 [PAL] [ORNL] [OPLNT]**		**28.6 [PAL] [ORNL] [OPLNT]**		**23.5 [PAL] [ORNL] [OPLNT]**		**24.2 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1820		1890		1600		1990		1360		2430		1670		2220		2250	
7439-96-5	MANGANESE	4130	160	183 [PAL] [ORNL] [MDRES]		72.7		206 [PAL] [ORNL] [MDRES]		54.8		33.9		72.7		181 [PAL] [ORNL] [MDRES]		45.8		66.2	
7439-97-6	MERCURY	0.18	0.058	0.034	UL	0.012	J	0.02	J	0.007	UL	0.007	UL	0.034	UL	0.035	UL	0.035	UL	0.035	UL
7440-02-0	NICKEL	18.2	38	30.4 [BKG]		21.1 [BKG]		18.1		15.3		11		19.9 [BKG]		24.7 [BKG]		19.3 [BKG]		17.7	
7440-09-7	POTASSIUM	2610	NA	1460		1840		1880		1940		1720		2890 [BKG]		1660		2640 [BKG]		2340	
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.17	U	0.16	U	0.16	U	0.16	U	0.083	U	0.16	U	0.16	U	0.17	U	0.16	U
7440-23-5	SODIUM	258	NA	398 [BKG]		218		286 [BKG]		64.2		62.2		225		388 [BKG]		205		329 [BKG]	
7440-24-6	STRONTIUM	NA	120	12.2		11.6		9.8		9		5		13.3		12.3		12.7		11.7	
7440-31-5	TIN	NA	0.89	1.7	U	1.6	U	1.6	U	1.6	U	0.83	U	1.6	U	1.7	U	1.7	U	1.6	U
7440-62-2	VANADIUM	194	7.8	29.5 [PAL] [MDRES] [SSL]		35.3 [PAL] [MDRES] [SSL]	K	22.9 [PAL] [MDRES] [SSL]	K	28.1 [PAL] [MDRES] [SSL]		21.5 [PAL] [MDRES] [SSL]		38.3 [PAL] [MDRES] [SSL]		31.5 [PAL] [MDRES] [SSL]		38.8 [PAL] [MDRES] [SSL]		33.2 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	**77 [BKG] [PAL] [SSL]**		**71.5 [BKG] [PAL] [SSL]**		43.5		39.7		28		54.7 [PAL] [SSL]		66.1 [PAL] [SSL]		52.4 [PAL] [SSL]		43.9	
	Miscellaneous																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																		
TTNUS288	PERCENT MOISTURE (%)	NA	NA	21.8		18.7		7.9		15.4		15.3		17.2		17.8		17.4		22.6	
TTNUS002	PH (s.u.)	NA	NA																		
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA																		
TTNUS046	TOTAL SOLIDS (%)	NA	NA	78.2		81.3		92.1		84.6		84.7		82.8		82.2		82.6		77.4	
	Volatile Organics (ug/kg)																				
71-43-2	**BENZENE**	NA	1.9	**4.4 [PAL] [MDSGW]**		1.5	U	1.7	U	1.6	U	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U
75-15-0	CARBON DISULFIDE	NA	19000	1.4	U	1.5	U	1.7	U	1.6	U	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U
67-66-3	CHLOROFORM	NA	0.91	1.4	U	1.5	U	1.7	U	1.6	U	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U
60-29-7	DIETHYL ETHER	NA	NA	1.4	U	1.5	U	1.7	U	1.6	U	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U
75-09-2	METHYLENE CHLORIDE	NA	19	1.5	B	1.9	B	3.1	B	0.88	B	3.7	B	1.5	B	1	B	1.7	B	0.84	B
108-88-3	TOLUENE	NA	100	3.2	B	1.5	U	1.7	U	0.43	B	1.9	U	1.7	U	1.7	U	1.5	U	1.7	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indi
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit
reported in this manner. This qualifier is also added to a positive result (reported

UJ – The analytical method could not detect the analyte at the sample specific de
imprecise based on validation review criteria. The associated numerical detectior

J –The chemical was present; however, the associated numerical result is not a p
laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

	nsample			X04SB0200204		X04SB0200406	
	location			X04SB020		X04SB020	
	project_no			00810_2010061		00810_2010061	
	sample_coc			X04SB0200204		X04SB0200406	
	gis_date			20100317		20100317	
	qc_type			NM		NM	
	sacode			NORMAL		NORMAL	
	matrix			SO		SO	
	duplicate						
	top_depth			2.00		4.00	
	bottom_dep			4.00		6.00	
	depth_unit			FT		FT	
	submatrix			SB		SB	
	z			085		087	
cas	x	utl95conv	minorpal	c_085		c_087	
	Explosives (mg/kg)						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.20	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.20	U	0.20	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.20	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.20	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.20	U	0.20	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.20	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.20	U
99-99-0	4-NITROTOLUENE	NA	30	0.20	U	0.20	U
2691-41-0	HMX	NA	380	0.20	U	0.20	U
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.20	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.20	U
479-45-8	TETRYL	NA	24	0.20	U	0.20	U
	Inorganics (mg/kg)						
7429-90-5	ALUMINUM	35400	7700	13100 [PAL] [ORNL] [MDRES]		17300 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	2.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.7 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	134	330	47.5		68.2	
7440-41-7	BERYLLIUM	3.3	16	0.47	J	0.60	J
7440-43-9	CADMIUM	0.61	0.36	0.16	U	0.16	U
7440-70-2	CALCIUM	2590	NA	137		177	
7440-47-3	CHROMIUM	60.1	26	15.1		22.6	
7440-48-4	COBALT	133	2.3	3.7 [PAL] [ORNL]		3.5 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	6.7		7.6	
7439-89-6	IRON	83100	5500	15600 [PAL] [ORNL] [MDRES]		16600 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	8.3		8.9	
7439-93-2	**LITHIUM**	NA	2	**12.5 [PAL] [OPLNT]**		**17.6 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1170		1710	
7439-96-5	MANGANESE	4130	160	86		34.8	
7439-97-6	MERCURY	0.18	0.058	0.007	UL	0.007	UL
7440-02-0	NICKEL	18.2	38	8		10.6	
7440-09-7	POTASSIUM	2610	NA	919		2120	
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.16	U	0.16	U
7440-23-5	SODIUM	258	NA	40.6	J	170	
7440-24-6	STRONTIUM	NA	120	5		8.8	
7440-31-5	TIN	NA	0.89	1.7	U	1.6	U
7440-62-2	VANADIUM	194	7.8	21.5 [PAL] [MDRES] [SSL]		30.7 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	22.4		28.2	
	Miscellaneous						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA				
TTNUS288	PERCENT MOISTURE (%)	NA	NA	14.3		16	
TTNUS002	PH (s.u.)	NA	NA				
TTNUS003	TOTAL ORGANIC CARBON mg/kg)	66500	NA				
TTNUS046	TOTAL SOLIDS (%)	NA	NA	85.7		84	
	Volatile Organics (ug/kg)						
71-43-2	**BENZENE**	NA	1.9	1.5	U	1.6	U
75-15-0	CARBON DISULFIDE	NA	19000	1.5	U	1.6	U
67-66-3	CHLOROFORM	NA	0.91	1.5	U	1.6	U
60-29-7	DIETHYL ETHER	NA	NA	1.5	U	1.6	U
75-09-2	METHYLENE CHLORIDE	NA	19	2.1	B	1.9	B
108-88-3	TOLUENE	NA	100	1.5	U	1.6	U

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading (ND)
Notes:
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TABLE 6-6

GROUNDWATER SAMPLING RESULTS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	ssample							X04GW001		X04GW002		X04GW002-AVG		X04GW002-D		X04GW003					
	location							X04GW001		X04GW002		X04GW002		X04GW002		X04GW003					
	project_no							90810_2010060		90810_2010060		90810_2010060		90810_2010060		90810_2010060					
	sample_coc							X04GW001		X04GW002		X04GW002-AVG		FD031410-01		X04GW003					
	gis_date							20100314		20100314		20100314		20100314		20100313					
	sc_type							NM		NM		NM		FD		NM					
	sacode							NORMAL		ORIG		AVG		DUP		NORMAL					
	matrix							GW		GW		GW		GW		GW					
	duplicate													X04GW002							
	top_depth							-9999.00		-9999.00		-9999.00		-9999.00		-9999.00					
	bottom_dep							-9999.00		-9999.00		-9999.00		-9999.00		-9999.00					
	depth_unit							NA		NA		NA		NA		NA					
	submatrix							NA		NA		NA		NA		NA					
	z							001		003		004		006		009					
cas	s	minorpal	orntlap	orntlap	b	mcl	mde	reference	c. 001		c. 003		c. 004		c. 006		c. 009				
	Explosives (ug/L)																				
99-35-4	1,3,5-TRINITROBENZENE	110	110	N		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
99-65-0	1,3-DINITROBENZENE	0.37	0.37	N		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
118-96-7	2,4,6-TRINITROTOLUENE	2.2	2.2	C		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.095	J			
121-14-2	2,4-DINITROTOLUENE	0.22	0.22	C		NA	7.3	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
606-20-2	2,6-DINITROTOLUENE	3.7	3.7	N		NA	3.7	MDE Cleanup Standard	0.19	U	0.2	U	0.2	U			0.19	U			
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	7.3	7.3	N		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
88-72-2	2-NITROTOLUENE	0.31	0.31	C		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
618-87-1	3,5-DINITROANILINE	NA	NA			NA	NA	NA	0.19	U	0.2	U	0.2	U			0.19	U			
99-08-1	3-NITROTOLUENE	0.37	0.37	N		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	7.3	7.3	N		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
99-99-0	4-NITROTOLUENE	4.2	4.2	C		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
2691-41-0	HMX	180	180	N		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
98-95-3	NITROBENZENE	0.12	0.12	C		NA	0.35	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
55-63-0	NITROGLYCERIN	0.37	0.37	N		NA	NA	ORNL-R	1.4	UJ	1.5	UJ	1.5	UJ			1.4	UJ			
78-11-5	PETN	NA	NA			NA	NA	NA	1.4	U	1.5	U	1.5	U			1.4	U			
121-82-4	RDX	0.61	0.61	C		NA	NA	ORNL-R	0.19	U	0.2	U	0.2	U			0.19	U			
479-45-8	TETRYL	15	15	N		NA	NA	ORNL-R	0.29	U	0.3	U	0.3	U			0.29	U			
	Inorganics (ug/L)																				
7429-90-5	**ALUMINUM**	50	3700	N		50	50	MDE Cleanup Standard	**180 [PAL] [MCL] [MDE]**	J	**68.0 [PAL] [MCL] [MDE]**	J	**934 [PAL] [MCL] [MDE]**	J	**1800 [PAL] [MCL] [MDE]**	J	**1900 [PAL] [MCL] [MDE]**	J			
7440-36-0	ANTIMONY	1.5	1.5	N		6	6	ORNL-R	0.77	U	0.77	U	0.77	U	0.77	U	0.77	U			
7440-38-2	**ARSENIC**	0.045	0.045	C		10	10	ORNL-R	**1.0 [PAL] [ORNLTAP]**	U	1.0	U	1.0	U	1.0	U	1.0	U			
7440-39-3	BARIUM	730	730	N		2000	2000	ORNL-R	140	J	77.0	J	55.0	J	33.0	J	42.0	J			
7440-41-7	BERYLLIUM	4	7.3	N		4	4	MDE Cleanup Standard	0.3	U	0.44	J	0.39	J	0.34	J	0.3	U			
7440-43-9	CADMIUM	1.8	1.8	N		5	5	ORNL-R	0.37	U	0.37	U	0.37	U	0.37	U	0.37	U			
7440-70-2	CALCIUM	NA	NA			NA	NA	NA	5600		1400		1350		1300		540				
7440-47-3	CHROMIUM	100	5500	N		100	100	MDE Cleanup Standard	2.0	U	2.0	U	4.0	J	8.0		2.0	U			
7440-48-4	**COBALT**	1.1	1.1	N		NA	NA	ORNL-R	**22.0 [PAL] [ORNLTAP]**	J	**4.3 [PAL] [ORNLTAP]**	J	**10.15 [PAL] [ORNLTAP]**	J	**16.0 [PAL] [ORNLTAP]**	J	**5.9 [PAL] [ORNLTAP]**	J			
7440-50-8	COPPER	150	150	N		1300	1300	ORNL-R	3.6	U	5.9	J	6.35	J	6.8	J	3.7	J			
7439-89-6	**IRON**	300	2600	N		300	300	MDE Cleanup Standard	220	J	74.0	J	**1087 [PAL] [MCL] [MDE]**	J	**2100 [PAL] [MCL] [MDE]**	J	**1500 [PAL] [MCL] [MDE]**	J			
7439-92-1	LEAD	15	NA			15	15	MDE Cleanup Standard	2.2	U	2.2	U	5.5	L	9.9	L	2.2	U			
7439-93-2	LITHIUM	7.3	7.3	N		NA	NA	ORNL-R	36.0	U	36.0	U	36.0	U	36.0	U	36.0	U			
7439-95-4	MAGNESIUM	NA	NA			NA	NA	NA	6000	J	4300	J	2545	J	790	J	2100	J			
7439-96-5	**MANGANESE**	50	88	N		50	50	MDE Cleanup Standard	**200 [PAL] [ORNLTAP] [MCL] [MDE]**	J	**110 [PAL] [ORNLTAP] [MCL] [MDE]**	J	**78.5 [PAL] [MCL] [MDE]**	J	47.0	J	23.0	J			
7439-97-6	MERCURY	1.1	1.1	N		2	2	ORNL-R	0.077	U	0.077	U	0.078	U	0.077	U	0.077	U			
7440-02-0	NICKEL	73	73	N		NA	73	MDE Cleanup Standard	30.0		21.0	J	15.5	J	10.0	J	7.3	U			
7440-09-7	POTASSIUM	NA	NA			NA	NA	NA	1700		2800		2600	J	2400	J	1800				
7782-49-2	SELENIUM	18	18	N		50	50	ORNL-R	7.7	B	2.8	J	3.4	J	4.0	B	2.9	B			
7440-22-4	SILVER	18	18	N		100	100	ORNL-R	1.4	U	1.4	U	1.4	UL	1.4	UL	1.4	U			
7440-23-5	SODIUM	NA	NA			NA	NA	NA	59800	J	6000	J	4650	J	3300	J	5100	J			
7440-24-6	STRONTIUM	2200	2200	N		NA	NA	ORNL-R	57.0		16.0		13.5		11.0		8.9				
7440-31-5	TIN	2200	2200	N		NA	2200	MDE Cleanup Standard	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U			
7440-62-2	**VANADIUM**	3.7	18	N		NA	3.7	MDE Cleanup Standard	2.0	U	2.0	U	**4.6 [PAL] [MDE]**	J	**8.2 [PAL] [MDE]**	J	**4.4 [PAL] [MDE]**	J			
7440-66-6	ZINC	1100	1100	N		5000	5000	ORNL-R	45.0		53.0		33.0	J	13.0	J	11.0	J			
	Inorganics, Filtered (ug/L)																				
7429-90-5	**ALUMINUM**	50	3700	N		50	50	MDE Cleanup Standard									**78 [PAL] [MCL] [MDE]**	J			
7440-36-0	ANTIMONY	1.5	1.5	N		6	6	ORNL-R									0.66	U			
7440-38-2	ARSENIC	0.045	0.045	C		10	10	ORNL-R									1	U			
7440-39-3	BARIUM	730	730	N		2000	2000	ORNL-R									30				
7440-41-7	BERYLLIUM	4	7.3	N		4	4	MDE Cleanup Standard									0.6	B			
7440-43-9	CADMIUM	1.8	1.8	N		5	5	ORNL-R									0.33	U			
7440-70-2	CALCIUM	NA	NA			NA	NA	NA									600				
7440-47-3	CHROMIUM	100	5500	N		100	100	MDE Cleanup Standard									1.0	U			
7440-48-4	**COBALT**	1.1	1.1	N		NA	NA	ORNL-R									**5.8 [PAL] [ORNLTAP]**				
7440-50-8	COPPER	150	150	N		1300	1300	ORNL-R									3.3	U			
7439-89-6	IRON	300	2600	N		300	300	MDE Cleanup Standard									20	U			
7439-92-1	LEAD	15	NA			15	15	MDE Cleanup Standard									2	UL			
7439-93-2	LITHIUM	7.3	7.3	N		NA	NA	ORNL-R									33	U			
7439-95-4	MAGNESIUM	NA	NA			NA	NA	NA									1900				
7439-96-5	MANGANESE	50	88	N		50	50	MDE Cleanup Standard									14				
7439-97-6	MERCURY	1.1	1.1	N		2	2	ORNL-R									0.14	J			
7440-02-0	NICKEL	73	73	N		NA	73	MDE Cleanup Standard									6.6	U			
7440-09-7	POTASSIUM	NA	NA			NA	NA	NA									1200				
7782-49-2	SELENIUM	18	18	N		50	50	ORNL-R									1.6	U			
7440-22-4	SILVER	18	18	N		100	100	ORNL-R									1.3	U			
7440-23-5	SODIUM	NA	NA			NA	NA	NA									5600				
7440-24-6	STRONTIUM	2200	2200	N		NA	NA	ORNL-R									7.8				
7440-31-5	TIN	2200	2200	N		NA	2200	MDE Cleanup Standard									6.6	U			
7440-62-2	VANADIUM	3.7	18	N		NA	3.7	MDE Cleanup Standard									1.6	U			
7440-66-6	ZINC	1100	1100	N		5000	5000	ORNL-R									6.6	U			
	Volatile Organics (ug/L)																				
71-43-2	BENZENE	0.41	0.41	C		5	5	ORNL-R	1	U	1	U	1	U	1	U	1	U			
75-15-0	CARBON DISULFIDE	100	100	N		NA	100	MDE Cleanup Standard	1	U	1	U	1	U	1	U	1	U			
67-66-3	CHLOROFORM	0.19	0.19	C		80	80	ORNL-R	1	U	1	U	1	U	1	U	1	U			
60-29-7	DIETHYL ETHER	NA	NA			NA	NA		1	U	1	U	1	U	1	U	1	U			
75-09-2	METHYLENE CHLORIDE	4.8	4.8	C		5	5	ORNL-R	1	U	1	U	1	U	1	U	1	U			
108-88-3	TOLUENE	230	230	N		1000	1000	ORNL-R	1	U	1	U	1	U	1	U	1	U			

ug/L = micrograms per liter
PAL = Project action limit
S.U. = Standard unit
u95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

			a01	a02		a04		a07		a13		a15		a17		a19		a20
			001	002		004		007		013		015		017		019		020
	nsample		X0	X05SS0010006-AVG		X05SS0010006-D		X05SS0010024		X05SS0020006		X05SS0020024		X05SS0030006		X05SS0030024		X05SS0030024-AVG
	location			X05SB001	X05SB001	X05SB001	X05SB001	X05SB001	X05SB001	X05SB002	X05SB002	X05SB002	X05SB003	X05SB003	X05SB003	X05SB003	X05SB003	X05SB003
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042
	sample_coc			X05SS0010006-AVG		FD012310-02		X05SS0010024		X05SS0020006		X05SS0020024		X05SS0030006		X05SS0030024		X05SS0030024-AVG
	gis_date			20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123
	qc_type			NM		FD		NM		NM		NM		NM		NM		NM
	sacode			AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG
	matrix			SO		SO		SO		SO		SO		SO		SO		SO
	duplicate					X05SS0010006												
	top_depth			0		0		0		0		0		0		0		0
	bottom_dep		0.5		0.5		0.5		2		0.5		2		0.5		2	
	depth_unit		FT	FT		FT		FT		FT		FT		FT		FT		FT
	submatrix		SS	SS		SS		SS		SS		SS		SS		SS		SS
cas	x	utl95val	c_0	c_002		c_004		c_007		c_013		c_015		c_017		c_019		c_020
	Explosives (mg/kg)																	
99-35-4	1,3,5-TRINITROBENZENE	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
99-65-0	1,3-DINITROBENZENE	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
118-96-7	2,4,6-TRINITROTOLUENE	NA	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.245
121-14-2	2,4-DINITROTOLUENE	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
606-20-2	2,6-DINITROTOLUENE	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
88-72-2	2-NITROTOLUENE	0.15	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
618-87-1	3,5-DINITROANILINE	NA	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.245
99-08-1	3-NITROTOLUENE	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
99-99-0	4-NITROTOLUENE	0.21	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
2691-41-0	HMX	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
98-95-3	NITROBENZENE	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
55-63-0	NITROGLYCERIN	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.15
78-11-5	PETN	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.15
121-82-4	RDX	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
479-45-8	TETRYL	NA	U	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.195
	Inorganics (mg/kg)																	
7429-90-5	**ALUMINUM**	19700		17050 [PAL] [ORNL] [MDRES] [SSL]		18800 [PAL] [ORNL] [MDRES] [SSL]		8500 [PAL] [ORNL] [MDRES] [SSL]		16600 [PAL] [ORNL] [MDRES] [SSL]	J	**32400 [BKG] [PAL] [ORNL] [MDRES] [SSL]**		14800 [PAL] [ORNL] [MDRES] [SSL]		10900 [PAL] [ORNL] [MDRES] [SSL]	J	14750 [PAL] [ORNL] [MDRES] [SSL]
7440-36-0	ANTIMONY	NA	UL	0.065	UL	0.065	UL	0.064	UJ	0.066	UL	0.066	UL	0.066	UL	0.065	UL	0.0655
7440-38-2	**ARSENIC**	14.9	J	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]		3.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	9.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.5 [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	K	59.3	J	64.7	L	73.3	K	74.2	K	77.8	K	92.4 [BKG]	K	103 [BKG]	K	104 [BKG]
7440-41-7	BERYLLIUM	1.1	J	0.71	L	0.74	L	0.95	J	0.67		0.72	J	0.74	J	0.99		0.995
7440-43-9	CADMIUM	2.5	U	0.16	UL	0.16	UL	0.16	U	0.49 [PAL] [SSL]		0.21	J	0.55 [PAL] [SSL]		0.43 [PAL] [SSL]	J	0.2575
7440-70-2	CALCIUM	2060	K	275.5	J	282	L	269	K	343	K	431	K	840	K	469	K	440.5
7440-47-3	CHROMIUM	33.4	K	22.4	J	24.4	L	26.6 [PAL] [SSL]	K	24.3	K	25	K	18.5	K	21.5	K	22.7
7440-48-4	COBALT	22.3		20.15 [PAL] [ORNL] [SSL]	L	19.9 [PAL] [ORNL] [SSL]	L	16.1 [PAL] [ORNL] [SSL]		14.4 [PAL] [ORNL] [SSL]		14.6 [PAL] [ORNL] [SSL]		14.5 [PAL] [ORNL] [SSL]		21.3 [PAL] [ORNL] [SSL]		21.65 [PAL] [ORNL] [SSL]
7440-50-8	**COPPER**	20.3		13.1	L	12.9	L	16.7		9.3		10.7		12.2		11		10.35
7439-89-6	IRON	38500		22850 [PAL] [ORNL] [MDRES] [SSL]		22900 [PAL] [ORNL] [MDRES] [SSL]		29400 [PAL] [ORNL] [MDRES] [SSL]		17400 [PAL] [ORNL] [MDRES] [SSL]		21700 [PAL] [ORNL] [MDRES] [SSL]		20100 [PAL] [ORNL] [MDRES] [SSL]		23400 [PAL] [ORNL] [MDRES] [SSL]		23200 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	LEAD	62.5		25.15 [PAL] [SSL]	L	27.3 [PAL] [SSL]	L	22.7 [PAL] [SSL]		21.2 [PAL] [SSL]		16.9 [PAL] [SSL]		23.8 [PAL] [SSL]		18.5 [PAL] [SSL]		17.5 [PAL] [SSL]
7439-93-2	LITHIUM	NA		19.1 [PAL] [ORNL] [OPLNT]	L	20.8 [PAL] [ORNL] [OPLNT]	L	25.4 [PAL] [ORNL] [OPLNT]		15.8 [PAL] [OPLNT]		20.5 [PAL] [ORNL] [OPLNT]		15.6 [PAL] [OPLNT]		17.9 [PAL] [ORNL] [OPLNT]		18.2 [PAL] [ORNL] [OPLNT]
7439-95-4	MAGNESIUM	1620		1280		1410		1890 [BKG]		1380		1710 [BKG]		1200		1320		1380
7439-96-5	**MANGANESE**	1390		583.5 [PAL] [ORNL] [MDRES] [SSL]		541 [PAL] [ORNL] [MDRES] [SSL]		445 [PAL] [ORNL] [MDRES] [SSL]		635 [PAL] [ORNL] [MDRES] [SSL]		558 [PAL] [ORNL] [MDRES] [SSL]		1310 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]		**1700 [BKG] [PAL] [ORNL] [MDRES] [MDSGW] [SSL]**		**1670 [BKG] [PAL] [ORNL] [MDRES] [MDSGW] [SSL]**
7439-97-6	MERCURY	0.16	J	0.0295	J	0.049	J	0.019	L	0.065 [PAL] [BTAG]	K	0.064 [PAL] [BTAG]	J	0.084 [PAL] [BTAG]	L	0.039	L	0.0405
7440-02-0	**NICKEL**	15.4		14.3	L	15.7 [BKG]	L	18.1 [BKG]		13.4		15.9 [BKG]		16.4 [BKG]		18.5 [BKG]		18.55 [BKG]
7440-09-7	POTASSIUM	1470		1525 [BKG]		1880 [BKG]		2110 [BKG]		1470		1850 [BKG]		1360		1390		1550 [BKG]
7782-49-2	SELENIUM	1.2	L	0.118	L	0.032	UL	0.064	UL	0.066	U	0.066	UL	0.22	L	0.11	L	0.0805
7440-22-4	SILVER	0.84	U	0.16	UL	0.16	UL	0.16	U	0.083	U	0.17	U	4 [BKG]		2 [BKG]		1.7 [BKG]
7440-23-5	SODIUM	120	K	38.65	J	47.9	J	59.8	K	41.4	K	46.7	K	66.9	K	64.6	K	67.45
7440-24-6	STRONTIUM	NA	K	6.75	J	7.9	L	8.4	K	8.3	K	9.6	K	11	K	8.5	K	8.95
7440-31-5	TIN	NA	U	1.6	U	1.6	U	1.6	U	0.83	U	1.7	U	1.7	U	1.6	U	1.65
7440-62-2	VANADIUM	53.3	K	35.75 [PAL] [MDRES] [SSL]	J	37.8 [PAL] [MDRES] [SSL]	L	42.4 [PAL] [ORNL] [MDRES] [SSL]	K	40.1 [PAL] [ORNL] [MDRES] [SSL]	K	43.7 [PAL] [ORNL] [MDRES] [SSL]	K	33.9 [PAL] [MDRES] [SSL]	K	38.3 [PAL] [MDRES] [SSL]	K	38.7 [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5		45.85 [BKG]	L	**47.7 [BKG] [PAL] [SSL]**	L	**51.9 [BKG] [PAL] [SSL]**		44.2 [BKG]		**53.6 [BKG] [PAL] [SSL]**		**73.6 [BKG] [PAL] [SSL]**		**61 [BKG] [PAL] [SSL]**		**57.5 [BKG] [PAL] [SSL]**
	Miscellaneous Parameters																	
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																	
TTNUS288	PERCENT MOISTURE (%)																	
TTNUS002	PH (S.U.)	8.8																
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																
TTNUS046	TOTAL SOLIDS (%)	79.2																

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a **positive result (reported by the laboratory) if the detected** concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				a22		a25		a27		a29		a31		a33		a35		a37	
	nsample			022		025		027		029		031		033		035		037	
	location		X05SB003	X05SS0030024-D	X05SB003	X05SS0040006	X05SB004	X05SS0040024	X05SB004	X05SS0050006	X05SB005	X05SS0050024	X05SB005	X05SS0060006	X05SB006	X05SS0060024	X05SB006	X05SS0070006	X05SB007
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			FD012310-01		X05SS0040006		X05SS0040024		X05SS0050006		X05SS0050024		X05SS0060006		X05SS0060024		X05SS0070006	
	gis_date		20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123
	qc_type			FD		NM		NM		NM		NM		NM		NM		NM	
	sacode			DUP		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate			X05SS0030024															
	top_depth			0		0		0		0		0		0		0		0	
	bottom_dep			2		2		0.5		2		0.5		2		0.5		2	0.5
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS	
cas	x	utl95val		c_022		c_025		c_027		c_029		c_031		c_033		c_035		c_037	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	0.099	J
78-11-5	PETN	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																		
7429-90-5	**ALUMINUM**	19700	J	18600 [PAL] [ORNL] [MDRES] [SSL]	J	11800 [PAL] [ORNL] [MDRES] [SSL]		**20300 [BKG] [PAL] [ORNL] [MDRES] [SSL]**	J	11700 [PAL] [ORNL] [MDRES] [SSL]		12600 [PAL] [ORNL] [MDRES] [SSL]		11900 [PAL] [ORNL] [MDRES] [SSL]		**20600 [BKG] [PAL] [ORNL] [MDRES] [SSL]**		16400 [PAL] [ORNL] [MDRES] [SSL]	J
7440-36-0	ANTIMONY	NA	UL	0.066	UL	0.066	UL	0.065	UL	0.065	UL	0.064	UL	0.067	J	0.076	J	0.16	B
7440-38-2	**ARSENIC**	14.9	L	4.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.1 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.6 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	4 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	J	105 [BKG]	L	90.8 [BKG]	K	88.4 [BKG]	K	43.1	K	59.7	K	52.4	K	54.7	K	54.3	K
7440-41-7	BERYLLIUM	1.1	L	1	L	0.75		0.75		0.42	J	0.57		0.63	J	0.73	J	0.56	
7440-43-9	CADMIUM	2.5	JL	0.17	UL	0.082	U	0.081	U	0.081	U	0.082	U	0.96 [PAL] [SSL]		0.22	J	0.08	U
7440-70-2	CALCIUM	2060	J	412	L	615	K	280	K	203	K	253	K	212	K	203	K	172	K
7440-47-3	CHROMIUM	33.4	J	23.9	L	17.5	K	17.7	K	13.9	K	18	K	20.2	K	22.1	K	19.8	K
7440-48-4	COBALT	22.3	L	22 [PAL] [ORNL] [SSL]	L	12.5 [PAL] [ORNL]		12.2 [PAL] [ORNL]		8.3 [PAL] [ORNL]		10.5 [PAL] [ORNL]		13.7 [PAL] [ORNL] [SSL]		14.6 [PAL] [ORNL] [SSL]		10 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	L	9.7	L	11.2		10.4		8.5		12.5		18		16.2		**38.6 [BKG] [PAL] [SSL]**	
7439-89-6	IRON	38500		23000 [PAL] [ORNL] [MDRES] [SSL]		16800 [PAL] [ORNL] [MDRES] [SSL]		16900 [PAL] [ORNL] [MDRES] [SSL]		12000 [PAL] [ORNL] [MDRES] [SSL]		16600 [PAL] [ORNL] [MDRES] [SSL]		20900 [PAL] [ORNL] [MDRES] [SSL]		25500 [PAL] [ORNL] [MDRES] [SSL]		17300 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	L	16.5 [PAL] [SSL]	L	29.4 [PAL] [SSL]		12.3 [PAL] [SSL]		19.6 [PAL] [SSL]		27.6 [PAL] [SSL]		22.8 [PAL] [SSL]		20.1 [PAL] [SSL]		32 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	L	18.5 [PAL] [ORNL] [OPLNT]	L	16.4 [PAL] [ORNL] [OPLNT]		17.7 [PAL] [ORNL] [OPLNT]		11.2 [PAL] [OPLNT]		15 [PAL] [OPLNT]		15.5 [PAL] [OPLNT]		19.4 [PAL] [ORNL] [OPLNT]		15.1 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620		1440		1360		1390		906		1230		1050		1340		1140	
7439-96-5	**MANGANESE**	1390		**1640 [BKG] [PAL] [ORNL] [MDRES] [MDSGW] [SSL]**		569 [PAL] [ORNL] [MDRES] [SSL]		464 [PAL] [ORNL] [MDRES] [SSL]		275 [PAL] [ORNL] [MDRES] [SSL]		350 [PAL] [ORNL] [MDRES] [SSL]		401 [PAL] [ORNL] [MDRES] [SSL]		330 [PAL] [ORNL] [MDRES] [SSL]		381 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	MERCURY	0.16	J	0.046	J	0.045	L	0.031	K	0.051	L	0.049	L	0.053	J	0.029	J	**0.18 [BKG] [PAL] [STAG]**	K
7440-02-0	**NICKEL**	15.4	L	18.6 [BKG]	L	15.1		15.1		9.7		13.9		14.1		17.5 [BKG]		12.1	
7440-09-7	POTASSIUM	1470		1710 [BKG]		1480 [BKG]		1520 [BKG]		1070		1450		1550 [BKG]		1420		1780 [BKG]	
7782-49-2	SELENIUM	1.2	L	0.051	L	0.033	UL	0.065	U	0.032	UL	0.12	L	0.19	J	0.064	UL	0.14	J
7440-22-4	SILVER	0.84	L	1.4 [BKG]	L	0.082	U	0.081	U	0.081	U	0.082	U	0.16	U	0.16	U	0.08	U
7440-23-5	SODIUM	120	J	70.3	L	40.1	K	46.5	K	35.4	K	43.8	K	43.4	J	31.3	J	43.3	K
7440-24-6	STRONTIUM	NA	J	9.4	L	10.3	K	8.1	K	5.2	K	6.9	K	6.1	K	5.9	K	6.8	K
7440-31-5	TIN	NA	U	1.7	U	0.83	U	0.81	U	0.82	U	0.82	U	1.7	U	1.6	U	0.80	U
7440-62-2	VANADIUM	53.3	J	39.1 [PAL] [ORNL] [MDRES] [SSL]	L	32.4 [PAL] [MDRES] [SSL]	K	30.9 [PAL] [MDRES] [SSL]	K	22 [PAL] [MDRES] [SSL]	K	29.1 [PAL] [MDRES] [SSL]	K	31 [PAL] [MDRES] [SSL]	K	33.1 [PAL] [MDRES] [SSL]	K	33.1 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	L	**54 [BKG] [PAL] [SSL]**	L	**46.6 [BKG] [PAL] [SSL]**		41.8 [BKG]		29.4		39.2 [BKG]		**50 [BKG] [PAL] [SSL]**		46 [BKG]		36.8	
	Miscellaneous Parameters																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																		
TTNUS288	PERCENT MOISTURE (%)																		
TTNUS002	PH (S.U.)	8.8																	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																	
TTNUS046	TOTAL SOLIDS (%)	79.2																	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a **positive result (reported by the laboratory) if the detected** concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

			a39		a41		a43		a45		a47		a09		a11		a51	
			039		041		043		045		047		009		011		051	
	nsample		X05SS0070024		X05SS0080006		X05SS0080024		X05SS0090006		X05SS0090024		X05SS0100006		X05SS0100024		X05SS0110024	
	location		X05SB007	X05SB007	X05SB008	X05SB008	X05SB008	X05SB008	X05SB009	X05SB009	X05SB009	X05SB009	X05SB010	X05SB001	X05SB010	X05SB001	X05SB011	X05SB011
	project_no		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc		X05SS0070024		X05SS0080006		X05SS0080024		X05SS0090006		X05SS0090024		X05SS0100006		X05SS0100024		X05SS0110024	
	grs_date		20100123	20100123	20100123	20100123	20100123	20100123	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100124
	qc_type		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																	
	top_depth		0		0		0		0		0		0		0		0	
	bottom_dep		2		0.5		2		0.5		2		0.5		2		2	
	depth_unit		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix		SS		SS		SS		SS		SS		SS		SS		SS	
cas	x	utl95val	c_039		c_041		c_043		c_045		c_047		c_009		c_011		c_051	
	Explosives (mg/kg)																	
99-35-4	1,3,5-TRINITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																	
7429-90-5	**ALUMINUM**	19700	16100 [PAL] [ORNL] [MDRES] [SSL]	J	10500 [PAL] [ORNL] [MDRES] [SSL]	J	12300 [PAL] [ORNL] [MDRES] [SSL]	J	5950 [SSL]		9410 [PAL] [ORNL] [MDRES] [SSL]		12400 [PAL] [ORNL] [MDRES] [SSL]		9410 [PAL] [ORNL] [MDRES] [SSL]		14600 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.066	UL	0.066	UL	0.064	UL	0.033	UL	0.12	J	0.033	UL	0.033	UL	0.037	J
7440-38-2	**ARSENIC**	14.9	3.2 [PAL] [ORNL] [MDRES] [MDSGW]		2.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.6 [PAL] [ORNL] [MDRES] [MDSGW]		4.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	**15.7 [BKG] [PAL] [ORNL] [MDRES] [MDSGW]**	L	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	80.4	70.5	K	45.8	K	55.1	K	31.9	L	104 [BKG]	L	38.1	L	49.7	L	44.3	L
7440-41-7	BERYLLIUM	1.1	0.69		0.46	J	0.54		0.32	J	0.50	K	0.73	K	0.47	J	0.51	L
7440-43-9	CADMIUM	2.5	0.083	U	0.37 [PAL] [SSL]		0.20	J	0.21	J	0.083	UL	0.78 [PAL] [SSL]	L	0.27	L	0.55 [PAL] [SSL]	L
7440-70-2	CALCIUM	2060	188	K	982	K	688	K	626	L	387	L	1970	L	897	L	809	L
7440-47-3	CHROMIUM	33.4	20.6	K	25.5	K	21.4	K	12.4	L	15.3	L	15.8	L	12.9	L	17.8	L
7440-48-4	COBALT	22.3	11.3 [PAL] [ORNL]		8.2 [PAL] [ORNL]		9.4 [PAL] [ORNL]		3.2 [PAL] [ORNL]	L	4.5 [PAL] [ORNL]	L	7.6 [PAL] [ORNL]	L	4.5 [PAL] [ORNL]	L	4.6 [PAL] [ORNL]	L
7440-50-8	**COPPER**	20.3	14.3		11.7		13.6		12.1	L	22.8 [BKG]	L	13.4	L	13.1	L	**35.7 [BKG] [PAL] [SSL]**	L
7439-89-6	IRON	38500	15500 [PAL] [ORNL] [MDRES] [SSL]		13300 [PAL] [ORNL] [MDRES] [SSL]		14100 [PAL] [ORNL] [MDRES] [SSL]		8090 [PAL] [ORNL] [MDRES] [SSL]		14900 [PAL] [ORNL] [MDRES] [SSL]		11900 [PAL] [ORNL] [MDRES] [SSL]		12400 [PAL] [ORNL] [MDRES] [SSL]		14800 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	21.6 [PAL] [SSL]		30.1 [PAL] [SSL]		17.7 [PAL] [SSL]		10.1	L	8.9	L	11.1 [PAL] [SSL]	L	7.4	L	11.4 [PAL] [SSL]	L
7439-93-2	LITHIUM	NA	14.5 [PAL] [OPLNT]		10.9 [PAL] [OPLNT]		12.2 [PAL] [OPLNT]		4.4 [PAL] [OPLNT]	L	6.1 [PAL] [OPLNT]	L	7.3 [PAL] [OPLNT]	L	8.4 [PAL] [OPLNT]	L	13.9 [PAL] [OPLNT]	L
7439-95-4	MAGNESIUM	1620	1160		2960 [BKG]		2100 [BKG]		508		433		1130		754		1260	
7439-96-5	**MANGANESE**	1390	587 [PAL] [ORNL] [MDRES] [SSL]		254 [PAL] [ORNL] [MDRES] [SSL]		356 [PAL] [ORNL] [MDRES] [SSL]		365 [PAL] [ORNL] [MDRES] [SSL]		370 [PAL] [MDRES]		99.9		68.9		68.4	
7439-97-6	**MERCURY**	0.16	0.046	K	0.049	K	0.032	K	**0.59 [BKG] [PAL] [STAG]**	J	**0.48 [BKG] [PAL] [STAG]**	J	**1.2 [BKG] [PAL] [STAG]**		**0.38 [BKG] [PAL] [STAG]**		0.025	J
7440-02-0	**NICKEL**	15.4	12.7		34.1 [BKG]		22.1 [BKG]		7.9	L	14.6	L	18.6 [BKG]	L	14.2	L	11.3	L
7440-09-7	POTASSIUM	1470	1730 [BKG]		1190		1410		772		697		958		881		1520 [BKG]	
7782-49-2	SELENIUM	1.2	0.066	U	0.066	U	0.064	U	0.18	L	0.42	L	0.045	L	0.10	L	0.032	UL
7440-22-4	SILVER	0.84	0.083	U	0.081	U	0.081	U	0.08	UL	0.083	UL	0.092	UL	0.083	UL	0.083	UL
7440-23-5	SODIUM	120	47.5	K	43.4	K	51.7	K	12.6	J	21	J	20.9	J	20.3	J	44	L
7440-24-6	STRONTIUM	NA	7.2	K	7.5	K	7.6	K	7	L	13.6	L	10.7	L	8	L	7.5	L
7440-31-5	TIN	NA	0.83	U	0.81	U	0.82	U	0.80	U	0.83	U	0.83	U	1.1 [PAL] [BTAG]	K	0.83	U
7440-62-2	VANADIUM	53.3	30.2 [PAL] [MDRES] [SSL]	K	29 [PAL] [MDRES] [SSL]	K	26.9 [PAL] [MDRES] [SSL]	K	22.4 [PAL] [MDRES] [SSL]	L	21.5 [PAL] [MDRES] [SSL]	L	24.8 [PAL] [MDRES] [SSL]	L	18.8 [PAL] [MDRES] [SSL]	L	23.9 [PAL] [MDRES] [SSL]	L
7440-66-6	**ZINC**	37.5	36.5		**52.6 [BKG] [PAL] [SSL]**		43.4 [BKG]		18.7	L	16.1	L	38.7 [BKG]	L	25.5	L	33.3	L
	Miscellaneous Parameters																	
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																89	
TTNUS288	PERCENT MOISTURE (%)																1.8	
TTNUS002	PH (S.U.)	8.8															5.42	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200															4770	
TTNUS046	TOTAL SOLIDS (%)	79.2															98.2	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a **positive result (reported by the laboratory) if the detected** concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

			a53		a55		a57		a59		a61		a63		a65		a67	
			053		055		057		059		061		063		065		067	
	nsample		X05SS0120006		X05SS0120024		X05SS0130006		X05SS0130024		X05SS0140006		X05SS0140024		X05SS0150006		X05SS0150024	
	location	X05SB012	X05SB012	X05SB012	X05SB012	X05SB012	X05SB013	X05SB013	X05SB013	X05SB013	X05SB014	X05SB014	X05SB014	X05SB014	X05SB015	X05SB015	X05SB015	X05SB015
	project_no		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc		X05SS0120006		X05SS0120024		X05SS0130006		X05SS0130024		X05SS0140006		X05SS0140024		X05SS0150006		X05SS0150024	
	grs_date	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100124
	qc_type		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																	
	top_depth	0		0		0		0		0		0		0		0		0
	bottom_dep	0.5		2		0.5		2		0.5		2		0.5		2		2
	depth_unit		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix		SS		SS		SS		SS		SS		SS		SS		SS	
cas	x	utl95val	c_053		c_055		c_057		c_059		c_061		c_063		c_065		c_067	
	Explosives (mg/kg)																	
99-35-4	1,3,5-TRINITROBENZENE	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	2.5	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2		2	U	0.062	J
606-20-2	2,6-DINITROTOLUENE	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	2.5	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
2691-41-0	HMX	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	18.3	K	5.2	K
98-95-3	NITROBENZENE	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	0.94 [PAL] [ORNL]	J	0.22	J
78-11-6	PETN	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	12	U	1.2	U
121-82-4	RDX	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
479-45-8	TETRYL	NA	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	2	U	0.2	U
	Inorganics (mg/kg)																	
7429-90-5	**ALUMINUM**	19700	11800 [PAL] [ORNL] [MDRES] [SSL]		5680 [SSL]		18900 [PAL] [ORNL] [MDRES] [SSL]	J	12000 [PAL] [ORNL] [MDRES] [SSL]	J	15800 [PAL] [ORNL] [MDRES] [SSL]		14100 [PAL] [ORNL] [MDRES] [SSL]		8170 [PAL] [ORNL] [MDRES] [SSL]		12600 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.065	UL	0.033	UL	0.065	UL	0.064	UL	0.033	UL	0.065	UL	0.044	J	0.032	UL
7440-38-2	**ARSENIC**	14.9	3.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	0.82 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.1 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]		2.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	80.4	80.1	K	86.5 [BKG]	K	35.6	K	56.1	K	42.6	L	41.6	L	27.5	L	30.7	L
7440-41-7	BERYLLIUM	1.1	0.82		0.89	J	0.39	J	0.55		0.53	L	0.51	L	0.30	J	0.35	J
7440-43-9	CADMIUM	2.5	0.083	U	0.083	U	0.14	J	0.18	J	0.31	L	0.15	J	0.30	L	0.081	UL
7440-70-2	CALCIUM	2060	290	K	237	K	191	K	174	K	857	L	751	L	1830	L	713	L
7440-47-3	CHROMIUM	33.4	18.1	K	20.4	K	11.6	K	14.5	K	16.6	L	17.3	L	12.5	L	14.4	L
7440-48-4	COBALT	22.3	16.5 [PAL] [ORNL] [SSL]		15.8 [PAL] [ORNL] [SSL]		8.2 [PAL] [ORNL]		10.4 [PAL] [ORNL]		4.9 [PAL] [ORNL]	L	4 [PAL] [ORNL]	L	2.4 [PAL] [ORNL]	L	4 [PAL] [ORNL]	L
7440-50-8	**COPPER**	20.3	9.5		9.1		6.2		6.1		15.6	L	18.9	L	17.8	L	20.5 [BKG]	L
7439-89-6	IRON	38500	16100 [PAL] [ORNL] [MDRES] [SSL]		17400 [PAL] [ORNL] [MDRES] [SSL]		9060 [PAL] [ORNL] [MDRES] [SSL]		11200 [PAL] [ORNL] [MDRES] [SSL]		16400 [PAL] [ORNL] [MDRES] [SSL]		15800 [PAL] [ORNL] [MDRES] [SSL]		8860 [PAL] [ORNL] [MDRES] [SSL]		11300 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	19.5 [PAL] [SSL]		14.4 [PAL] [SSL]		15.8 [PAL] [SSL]		11.3 [PAL] [SSL]		9.3	L	9.6	L	15.1 [PAL] [SSL]	L	19 [PAL] [SSL]	L
7439-93-2	LITHIUM	NA	14.8 [PAL] [OPLNT]		15.7 [PAL] [OPLNT]		9.6 [PAL] [OPLNT]		12.7 [PAL] [OPLNT]		13.3 [PAL] [OPLNT]	L	14.2 [PAL] [OPLNT]	L	6.9 [PAL] [OPLNT]	L	10.1 [PAL] [OPLNT]	L
7439-95-4	MAGNESIUM	1620	1180		1420		680		891		1060		1100		725		737	
7439-96-5	**MANGANESE**	1390	1250 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]		975 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]		235 [PAL] [ORNL] [MDRES] [SSL]		253 [PAL] [ORNL] [MDRES] [SSL]		87.6		82.5		68.5		58.7	
7439-97-6	**MERCURY**	0.16	0.056	L	0.012	L	0.043	K	0.026	K	0.033	J	0.035	J	0.044		0.018	J
7440-02-0	**NICKEL**	15.4	15.8 [BKG]		17.7 [BKG]		8.3		10.5		**230 [BKG] [PAL] [ORNL] [MDRES] [SSL]**	L	**73 [BKG] [PAL] [SSL]**	L	7.1	L	7.5	L
7440-09-7	POTASSIUM	1470	1300		1240		958		1040		1580 [BKG]		1550 [BKG]		844		1160	
7782-49-2	SELENIUM	1.2	0.058	L	0.033	UL	0.13	J	0.064	U	0.033	UL	0.033	UL	0.044	L	0.032	UL
7440-22-4	SILVER	0.84	0.37		0.14	J	0.083	U	0.082	U	0.083	UL	0.083	UL	0.083	UL	0.081	UL
7440-23-5	SODIUM	120	44.3	K	46.4	K	25.2	K	27.4	K	48.7	L	56.9	L	18.2	J	27.4	L
7440-24-6	STRONTIUM	NA	7.3	K	6.9	K	5.1	K	5.6	K	7.1	L	7.1	L	6.7	L	5.4	L
7440-31-5	TIN	NA	0.83	U	0.83	U	0.83	U	0.82	U	0.83	U	0.83	U	0.83	U	0.81	U
7440-62-2	VANADIUM	53.3	33.2 [PAL] [MDRES] [SSL]	K	32.6 [PAL] [MDRES] [SSL]	K	21.9 [PAL] [MDRES] [SSL]	K	23.2 [PAL] [MDRES] [SSL]	K	25.9 [PAL] [MDRES] [SSL]	L	26.4 [PAL] [MDRES] [SSL]	L	20.1 [PAL] [MDRES] [SSL]	L	20.8 [PAL] [MDRES] [SSL]	L
7440-66-6	**ZINC**	37.5	**46.8 [BKG] [PAL] [SSL]**		**51.1 [BKG] [PAL] [SSL]**		26.3		33.5		33.1	L	33.6	L	29.9	L	24	L
	Miscellaneous Parameters																	
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																	
TTNUS288	PERCENT MOISTURE (%)																	
TTNUS002	PH (S.U.)	8.8									5.61		5.28 [		6.79		6.32	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																
TTNUS046	TOTAL SOLIDS (%)	79.2																

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a **positive result (reported by the laboratory) if the detected** concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

			a69		a71		a73		a75		a77		a79		a81		a83		a85	
			069		071		073		075		077		079		081		083		085	
	nsample		X05SS0160006		X05SS0160024		X05SS0170006		X05SS0170024		X05SS0180006		X05SS0180024		X05SS0190006		X05SS0190024		X05SS0200006	
	location		X05SB016	X05SB016	X05SB016	X05SB016	X05SB017	X05SB017	X05SB017	X05SB017	X05SB018	X05SB018	X05SB018	X05SB018	X05SB019	X05SB019	X05SB019	X05SB019	X05SB020	X05SB020
	project_no		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc		X05SS0160006		X05SS0160024		X05SS0170006		X05SS0170024		X05SS0180006		X05SS0180024		X05SS0190006		X05SS0190024		X05SS0200006	
	grs_date		20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	
	qc_type		NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																			
	top_depth		0		0		0		0		0		0		0		0		0	
	bottom_dep		0.5		2		0.5		2		0.5		2		0.5		2			
	depth_unit		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix		SS		SS		SS		SS		SS		SS		SS		SS		SS	
cas	x	utl95val	c_069		c_071		c_073		c_075		c_077		c_079		c_081		c_083		c_085	
	Explosives (mg/kg)																			
99-35-4	1,3,5-TRINITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
99-65-0	1,3-DINITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
118-96-7	2,4,6-TRINITROTOLUENE	NA	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
121-14-2	2,4-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.25		0.13	J	0.2	
606-20-2	2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
88-72-2	2-NITROTOLUENE	0.15	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
618-87-1	3,5-DINITROANILINE	NA	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	
99-08-1	3-NITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
99-99-0	4-NITROTOLUENE	0.21	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
2691-41-0	HMX	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.94	K	4	K	0.2	
98-95-3	NITROBENZENE	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
55-63-0	NITROGLYCERIN	NA	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	0.22	J	0.087	J	1.2	
78-11-5	PETN	NA	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
121-82-4	RDX	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
479-45-8	TETRYL	NA	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	
	Inorganics (mg/kg)																			
7429-90-5	**ALUMINUM**	19700	12600 [PAL] [ORNL] [MDRES] [SSL]		8090 [PAL] [ORNL] [MDRES] [SSL]		18100 [PAL] [ORNL] [MDRES] [SSL]	J	14100 [PAL] [ORNL] [MDRES] [SSL]	J	6970 [SSL]	J	7070 [SSL]	J	10300 [PAL] [ORNL] [MDRES] [SSL]	J	9090 [PAL] [ORNL] [MDRES] [SSL]	J	11000 [PAL] [ORNL] [MDRES] [SSL]	
7440-36-0	ANTIMONY	NA	0.066	UL	0.033	UL	0.064	UL	0.066	UL	0.071	B	0.065	UJ	0.078	B	0.066	UL	0.063	
7440-38-2	**ARSENIC**	14.9	4.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	2 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.7 [PAL] [ORNL] [MDRES] [MDSGW]		3 [PAL] [ORNL] [MDRES] [MDSGW]		2.2 [PAL] [ORNL] [MDRES] [MDSGW]		3.2 [PAL] [ORNL] [MDRES] [MDSGW]		3 [PAL] [ORNL] [MDRES] [MDSGW]		2.6 [PAL] [ORNL] [MDRES] [MDSGW]		2.3 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	57.5	K	55.9	K	28.1	K	42	K	25.9	K	35.7	K	37.4	K	34.6	K	36.5	
7440-41-7	BERYLLIUM	1.1	0.65	J	0.64	J	0.33	J	0.51		0.29	J	0.47	J	0.46	J	0.43	J	0.61	
7440-43-9	CADMIUM	2.5	0.16	U	0.16	U	0.08	U	0.082	U	0.11	J	0.082	U	0.74 [PAL] [SSL]		0.49 [PAL] [SSL]		1.2 [PAL] [SSL]	
7440-70-2	CALCIUM	2060	207	K	125	K	168	K	164	K	634	K	594	K	3230 [BKG]	K	2140 [BKG]	K	2830 [BKG]	
7440-47-3	CHROMIUM	33.4	19.7	K	17	K	13.2	K	18.1	K	10.8	K	15.1	K	16	K	15.5	K	14.4	
7440-48-4	COBALT	22.3	7.7 [PAL] [ORNL]		8.3 [PAL] [ORNL]		7.3 [PAL] [ORNL]		8.1 [PAL] [ORNL]		2.8 [PAL] [ORNL]		3.3 [PAL] [ORNL]		4.4 [PAL] [ORNL]		3.8 [PAL] [ORNL]		5.7 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	15.8		12.6		11.1		10.2		26.4 [BKG]		19.2		**60.1 [BKG] [PAL] [SSL]**		**53.8 [BKG] [PAL] [SSL]**		23 [BKG]	
7439-89-6	IRON	38500	24600 [PAL] [ORNL] [MDRES] [SSL]		21000 [PAL] [ORNL] [MDRES] [SSL]		11400 [PAL] [ORNL] [MDRES] [SSL]		15200 [PAL] [ORNL] [MDRES] [SSL]		9450 [PAL] [ORNL] [MDRES] [SSL]		13600 [PAL] [ORNL] [MDRES] [SSL]		12700 [PAL] [ORNL] [MDRES] [SSL]		11400 [PAL] [ORNL] [MDRES] [SSL]		12000 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	25.9 [PAL] [SSL]		16.1 [PAL] [SSL]		18.2 [PAL] [SSL]		12.9 [PAL] [SSL]		16.6 [PAL] [SSL]		9.8		23.6 [PAL] [SSL]		20 [PAL] [SSL]		16.6 [PAL] [SSL]	
7439-93-2	LITHIUM	NA	21.5 [PAL] [ORNL] [OPLNT]		17.8 [PAL] [ORNL] [OPLNT]		9.5 [PAL] [OPLNT]		12.9 [PAL] [OPLNT]		6.8 [PAL] [OPLNT]		11.2 [PAL] [OPLNT]		9.9 [PAL] [OPLNT]		10 [PAL] [OPLNT]		7.7 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620	1410		1210		723		1090		574		872		1090		953		965	
7439-96-5	**MANGANESE**	1390	465 [PAL] [ORNL] [MDRES] [SSL]		262 [PAL] [ORNL] [MDRES] [SSL]		223 [PAL] [ORNL] [MDRES] [SSL]		182 [PAL] [ORNL] [MDRES]		103		87		166 [PAL] [MDRES]		109		166 [PAL] [MDRES]	
7439-97-6	**MERCURY**	0.16	0.054	L	0.022	L	0.051	K	0.042	K	0.075 [PAL] [BTAG]	K	0.066 [PAL] [BTAG]	K	0.16 [PAL] [BTAG]	K	0.089 [PAL] [BTAG]	K	**0.21 [BKG] [PAL] [BTAG]**	
7440-02-0	**NICKEL**	15.4	15.6 [BKG]		12.9		8		11.3		11.7		14.3		15.9 [BKG]		10.1		10.7	
7440-09-7	POTASSIUM	1470	1720 [BKG]		1480 [BKG]		977		1390		939		1520 [BKG]		1270		1340		995	
7782-49-2	SELENIUM	1.2	0.30	L	0.033	UL	0.075	J	0.066	U	0.065	U	0.065	U	0.065	U	0.066	U	0.088	
7440-22-4	SILVER	0.84	0.16	U	0.16	U	0.08	U	0.082	U	0.083	U	0.082	U	0.082	U	0.083	U	0.083	
7440-23-5	SODIUM	120	51.1	K	37	K	22.2	K	31	K	27.6	K	49.1	K	42.8	K	35.1	K	28.2	
7440-24-6	STRONTIUM	NA	7	K	5.8	K	4.7	K	5.7	K	5.2	K	6.7	K	11	K	8.6	K	11	
7440-31-5	TIN	NA	1.7	U	1.6	U	0.81	U	0.83	U	0.83	U	0.82	U	0.82	U	0.83	U	0.83	
7440-62-2	VANADIUM	53.3	33.7 [PAL] [MDRES] [SSL]	K	27.3 [PAL] [MDRES] [SSL]	K	24 [PAL] [MDRES] [SSL]	K	29.7 [PAL] [MDRES] [SSL]	K	16.8 [PAL] [MDRES] [SSL]	K	22.5 [PAL] [MDRES] [SSL]	K	27.3 [PAL] [MDRES] [SSL]	K	24.5 [PAL] [MDRES] [SSL]	K	26.6 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	37.5	45.4 [BKG]		37.8 [BKG]		24.3		31.7		30.2		29.5		45.9 [BKG]		33.6		39.7 [BKG]	
	Miscellaneous Parameters																			
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																			
TTNUS288	PERCENT MOISTURE (%)																			
TTNUS002	PH (S.U.)	8.8																		
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																		
TTNUS046	TOTAL SOLIDS (%)	79.2																		

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a **positive result (reported by the laboratory) if the detected** concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				a87		a89		a90		a92		a95		a97		a99		a011	
	nsample			087		089		090		092		095		097		099		101	
	location		X05SB020	X05SB020	X05SB020	X05SB021	X05SB021	X05SB021	X05SB021	X05SB021	X05SB021	X05SB021	X05SB022	X05SB022	X05SB022	X05SB022	X05SB023	X05SB023
	project_no			00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc			X05SS0200024		X05SS0210006		X05SS0210006-AVG		FD012410-01		X05SS0210024		X05SS0220006		X05SS0220024		X05SS0230006	
	grs_date		20100123	20100123	20100123	20100124	20100124	20100124	20100124	20100124	20100124	20100124	20100123	20100123	20100123	20100123	20100123	20100123	20100123
	qc_type			NM		NM		NM		FD		NM		NM		NM		NM	
	sacode			NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate									X05SS0210006									
	top_depth			0		0		0		0		0		0		0		0	
	bottom_dep		0.5		2		0.5		0.5		0.5		2		0.5		2		0.5
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS		SS		SS	
cas	x	utl95val		c_087		c_089		c_090		c_092		c_095		c_097		c_099		c_101	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
99-65-0	1,3-DINITROBENZENE	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24	U
121-14-2	2,4-DINITROTOLUENE	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
88-72-2	2-NITROTOLUENE	0.15	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24	U
99-08-1	3-NITROTOLUENE	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
99-99-0	4-NITROTOLUENE	0.21	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
2691-41-0	HMX	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
98-95-3	NITROBENZENE	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
55-63-0	NITROGLYCERIN	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U
78-11-5	PETN	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U
121-82-4	RDX	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
479-45-8	TETRYL	NA	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U
	Inorganics (mg/kg)																		
7429-90-5	**ALUMINUM**	19700	J	11200 [PAL] [ORNL] [MDRES] [SSL]		10300 [PAL] [ORNL] [MDRES] [SSL]		9890 [PAL] [ORNL] [MDRES] [SSL]		9480 [PAL] [ORNL] [MDRES] [SSL]		11000 [PAL] [ORNL] [MDRES] [SSL]		7590 [SSL]		11300 [PAL] [ORNL] [MDRES] [SSL]	J	3610 [SSL]	
7440-36-0	ANTIMONY	NA	UJ	0.033	UL	0.033	UL	0.0495	UL	0.066	UL	0.033	UL	0.12	L	0.033	UL	0.033	UL
7440-38-2	**ARSENIC**	14.9		1.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	0.88 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	BARIUM	80.4	K	39.1	L	33.8	L	34.3	L	34.8	L	35.9	L	76.2	K	113 [BKG]	K	37.4	K
7440-41-7	BERYLLIUM	1.1		0.69	L	0.42	L	0.41	L	0.40	L	0.41	L	0.74	J	0.95	J	0.37	J
7440-43-9	CADMIUM	2.5		0.66 [PAL] [SSL]	L	0.14	J	0.245	K	0.35	K	0.31	L	0.17	U	0.16	U	0.081	U
7440-70-2	CALCIUM	2060	K	2130 [BKG]	K	1490	J	1995	J	2500 [BKG]	J	2210 [BKG]	L	488	K	338	K	156	K
7440-47-3	CHROMIUM	33.4	K	15.2	L	14.4	L	13.85	L	13.3	L	14.1	L	21.3	K	22.3	K	13.8	K
7440-48-4	COBALT	22.3		6.6 [PAL] [ORNL]	L	4.8 [PAL] [ORNL]	L	4.8 [PAL] [ORNL]	L	4.8 [PAL] [ORNL]	L	5.1 [PAL] [ORNL]	L	15.3 [PAL] [ORNL] [SSL]		19.8 [PAL] [ORNL] [SSL]		6.6 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3		22.5 [BKG]	L	10	L	10.55	L	11.1	L	12.4	L	17.3		11.8		9.4	
7439-89-6	IRON	38500		13400 [PAL] [ORNL] [MDRES] [SSL]		13100 [PAL] [ORNL] [MDRES] [SSL]		12650 [PAL] [ORNL] [MDRES] [SSL]		12200 [PAL] [ORNL] [MDRES] [SSL]		12800 [PAL] [ORNL] [MDRES] [SSL]		18200 [PAL] [ORNL] [MDRES] [SSL]		18800 [PAL] [ORNL] [MDRES] [SSL]		11700 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5		12.8 [PAL] [SSL]	L	8.1	L	8.95	L	9.8	L	10.8	L	40.3 [PAL] [SSL]		23.3 [PAL] [SSL]		19.6 [PAL] [SSL]	
7439-93-2	LITHIUM	NA		7.8 [PAL] [OPLNT]	L	11.5 [PAL] [OPLNT]	L	11.15 [PAL] [OPLNT]	L	10.8 [PAL] [OPLNT]	L	11.1 [PAL] [OPLNT]	L	14 [PAL] [OPLNT]		16.5 [PAL] [ORNL] [OPLNT]		11.6 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620		872		821		843		865		876		1000		1130		778	
7439-96-5	**MANGANESE**	1390		95.2		90.9		101.45		112		115		1270 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]		1170 [PAL] [ORNL] [MDRES] [MDSGW] [SSL]		306 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	**MERCURY**	0.16	K	**0.59 [BKG] [OPLNT] [BTAG]**		0.018	J	0.02	J	0.022	J	0.03	J	0.099 [PAL] [BTAG]	L	0.037	L	0.015	L
7440-02-0	**NICKEL**	15.4		14.4	L	10.6	L	10.2	L	9.8	L	9.8	L	13.7	L	16.8 [BKG]		10.2	
7440-09-7	POTASSIUM	1470		947		1200		1220		1240		1280		1110		1440		977	
7782-49-2	SELENIUM	1.2	J	0.07	J	0.033	UL	0.033	UL	0.033	UL	0.033	UL	0.072	L	0.24	L	0.033	UL
7440-22-4	SILVER	0.84	U	0.082	UL	0.082	UL	0.0825	UL	0.083	UL	0.083	UL	0.53		0.19	J	0.081	U
7440-23-5	SODIUM	120	K	32.2	L	26.8	L	27.95	L	29.1	L	28.5	L	37.3	J	48.7	K	20.3	K
7440-24-6	STRONTIUM	NA	K	10.6	L	7	L	7.85	L	8.7	L	8.8	L	8.5	K	8.4	K	4.9	K
7440-31-5	TIN	NA	U	0.82	U	0.82	U	0.825	U	0.83	U	0.83	U	1.7	U	1.6	U	0.82	U
7440-62-2	VANADIUM	53.3	K	24.6 [PAL] [MDRES] [SSL]	L	21.4 [PAL] [MDRES] [SSL]	L	21.6 [PAL] [MDRES] [SSL]	L	21.8 [PAL] [MDRES] [SSL]	L	23 [PAL] [MDRES] [SSL]	L	34.6 [PAL] [MDRES] [SSL]	K	33.5 [PAL] [MDRES] [SSL]	K	26.2 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5		36.8	L	27.5	L	28.8	L	30.1	L	30.6	L	**55.9 [BKG] [PAL] [SSL]**		**51.4 [BKG] [PAL] [SSL]**		29.4	
	Miscellaneous Parameters																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)																		
TTNUS288	PERCENT MOISTURE (%)																		
TTNUS002	PH (S.U.)	8.8				6.96		6.96				7.38							
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200																	
TTNUS046	TOTAL SOLIDS (%)	79.2																	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a **positive result (reported by the laboratory) if the detected** concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
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TABLE 7-4

SURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

			a031		a051		a071		a091		a111	
			103		105		107		109		111	
	nsample		X05SS0230024		X05SS0240006		X05SS0240024		X05SS0250006		X05SS0250024	
	location		X05SB023	X05SB023	X05SB024	X05SB024	X05SB024	X05SB024	X05SB025	X05SB025	X05SB025	X05SB025
	project_no		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc		X05SS0230024		X05SS0240006		X05SS0240024		X05SS0250006		X05SS0250024	
	gis_date		20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123	20100123
	qc_type		NM		NM		NM		NM		NM	
	sacode		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix		SO		SO		SO		SO		SO	
	duplicate											
	top_depth		0		0		0		0		0	
	bottom_dep		2		0.5		2		0.5		2	
	depth_unit		FT		FT		FT		FT		FT	
	submatrix		SS		SS		SS		SS		SS	
cas	x	utl95val	c_103		c_105		c_107		c_109		c_111	
	Explosives (mg/kg)											
99-35-4	1,3,5-TRINITROBENZENE	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
2691-41-0	HMX	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U
78-11-5	PETN	NA	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U
121-82-4	RDX	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U
	Inorganics (mg/kg)											
7429-90-5	**ALUMINUM**	19700	11600 [PAL] [ORNL] [MDRES] [SSL]		13700 [PAL] [ORNL] [MDRES] [SSL]	J	14900 [PAL] [ORNL] [MDRES] [SSL]	J	7570 [SSL]	J	9410 [PAL] [ORNL] [MDRES] [SSL]	J
7440-36-0	ANTIMONY	NA	0.064	UL	0.065	UL	0.065	UL	0.065	UL	0.066	UL
7440-38-2	**ARSENIC**	14.9	2.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.6 [PAL] [ORNL] [MDRES] [MDSGW]		3.8 [PAL] [ORNL] [MDRES] [MDSGW]		2 [PAL] [ORNL] [MDRES] [MDSGW]		1.2 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	BARIUM	80.4	48.5	K	48.8	K	49.6	K	32	K	46.1	K
7440-41-7	BERYLLIUM	1.1	0.48	J	0.49		0.58		0.33	J	0.44	J
7440-43-9	CADMIUM	2.5	0.081	U	0.098	J	0.083	U	0.081	U	0.083	U
7440-70-2	CALCIUM	2060	121	K	247	K	183	L	192	K	168	K
7440-47-3	CHROMIUM	33.4	14.9	K	18	K	21.8	K	10.9	K	10.6	K
7440-48-4	COBALT	22.3	8.5 [PAL] [ORNL]		5.9 [PAL] [ORNL]		5.8 [PAL] [ORNL]		6.2 [PAL] [ORNL]		9.9 [PAL] [ORNL]	
7440-50-8	**COPPER**	20.3	9.1		10.4		11.4		11.8		6.6	
7439-89-6	IRON	38500	11800 [PAL] [ORNL] [MDRES] [SSL]		12300 [PAL] [ORNL] [MDRES] [SSL]		13600 [PAL] [ORNL] [MDRES] [SSL]		8380 [PAL] [ORNL] [MDRES] [SSL]		7470 [PAL] [ORNL] [MDRES] [SSL]	
7439-92-1	LEAD	62.5	12.6 [PAL] [SSL]		20.4 [PAL] [SSL]		14.7 [PAL] [SSL]		17 [PAL] [SSL]		9.7	
7439-93-2	LITHIUM	NA	13.9 [PAL] [OPLNT]		14.6 [PAL] [OPLNT]		19.2 [PAL] [ORNL] [OPLNT]		8.9 [PAL] [OPLNT]		8.6 [PAL] [OPLNT]	
7439-95-4	MAGNESIUM	1620	910		1140		1510		715		699	
7439-96-5	**MANGANESE**	1390	294 [PAL] [ORNL] [MDRES] [SSL]		117		73.8		200 [PAL] [ORNL] [MDRES]		335 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	**MERCURY**	0.16	0.046	L	0.042	K	0.018	K	0.031	K	0.014	K
7440-02-0	**NICKEL**	15.4	11.8		10.7		13.3		7.5		7.8	
7440-09-7	POTASSIUM	1470	1380		1920 [BKG]		1940 [BKG]		963		800	
7782-49-2	SELENIUM	1.2	0.10	L	0.065	U	0.065	U	0.14	J	0.12	J
7440-22-4	SILVER	0.84	0.081	U	0.082	U	0.083	U	0.081	U	0.083	U
7440-23-5	SODIUM	120	33	K	47.3	K	41.6	K	24.5	K	21.5	K
7440-24-6	STRONTIUM	NA	5.7	K	7.3	K	6.8	K	5.2	K	4.9	K
7440-31-5	TIN	NA	0.81	U	0.82	U	0.83	U	0.81	U	0.83	U
7440-62-2	VANADIUM	53.3	25.2 [PAL] [MDRES] [SSL]	K	33.7 [PAL] [MDRES] [SSL]	K	32.7 [PAL] [MDRES] [SSL]	K	21.8 [PAL] [MDRES] [SSL]	K	16.7 [PAL] [MDRES] [SSL]	K
7440-66-6	**ZINC**	37.5	31.9		32.4		39.4 [BKG]		23.6		24.5	
	Miscellaneous Parameters											
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)											
TTNUS288	PERCENT MOISTURE (%)											
TTNUS002	PH (S.U.)	8.8										
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200										
TTNUS046	TOTAL SOLIDS (%)	79.2										

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a **positive result (reported by the laboratory) if the detected** concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
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TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter																column2		column4		column6		column8		column10		column12		column14	
	nsample																X05SB0010204		X05SB0010406		X05SB0020204		X05SB0020406		X05SB0030204		X05SB0030406		X05SB0040204	
	location																X05SB001		X05SB001		X05SB002		X05SB002		X05SB003		X05SB003		X05SB004	
	project_no																00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc																X05SB0010204		X05SB0010406		X05SB0020204		X05SB0020406		X05SB0030204		X05SB0030406		X05SB0040204	
	gis_date																20100315		20100315		20100315		20100315		20100314		20100314		20100314	
	qc_type																NM		NM		NM		NM		NM		NM		NM	
	sacode																NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix																SO		SO		SO		SO		SO		SO		SO	
	duplicate																													
	top_depth																2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep																4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit																FT		FT		FT		FT		FT		FT		FT	
	submatrix																SB		SB		SB		SB		SB		SB		SB	
	z																001		003		005		007		009		011		013	
cas	r	utl95conv	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	lant	ref		c_001		c_003		c_005		c_007		c_009		c_011		c_013	
	Explosives (mg/kg)																													
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	N	NA	NA	NA	NA	NA	NA	9	18	NC	Sunahara Plant		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	610	N	NA	NA	NA	NA	NA	NC	NC	NC	NC	ORNL-R		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	3.6	N	NA	NA	NA	NA	NA	NA	6	12	NC	ORNL-R		0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	C	16	0.57	NA	NA	NA	NA	6	20	NC	MDE Cleanup Standard S-GW		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	N	7.8	0.25	NA	NA	NA	NA	5	7	NC	MDE Cleanup Standard S-GW		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NC	NC	80	ORNL-R			0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	C	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA		0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	30	C	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	380	N	NA	NA	NA	NA	NA	NA	9341	600	NC	ORNL-R		0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	4.8	C	3.9	0.023	NA	NA	NA	NA	40	NC	NC	MDE Cleanup Standard S-GW		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R		1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA		1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	5.5	C	NA	NA	NA	NA	NA	NA	9537	98	NC	ORNL-R		0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	24	N	NA	NA	NA	NA	NA	NA	NC	NC	25	ORNL-R		0.19	U	0.2	U	0.2	UJ	0.2	UJ	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																													
7429-90-5	**ALUMINUM**	35400	7700	7700	N	7800	NA	pH < 5.5	NC	NC	NC	NC	NC	NC	ORNL-R		16100 [PAL] [ORNL] [MDRES]		12700 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]		24400 [PAL] [ORNL] [MDRES]		30400 [PAL] [ORNL] [MDRES]		**38900 [BKG] [PAL] [ORNL] [MDRES]**		19300 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	3.1	N	3.1	13	0.27	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		0.033	UL	0.032	UL	0.064	UL	0.065	UL	0.066	UL	0.064	UL	0.065	UL
7440-38-2	ARSENIC	18.9	0.026	0.39	C	0.43	0.026	18	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW		2.6 [PAL] [ORNL] [MDRES] [MDSGW]		1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	5.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	5.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	**BARIUM**	134	330	1500	N	1600	6000	330	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		71.9	L	24.9		84.8	L	95.8	L	80.9	L	83.6	L	75.9	L
7440-41-7	BERYLLIUM	3.3	16	16	N	16	1200	21	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R		0.89	J	0.56	J	0.79	J	1	L	0.86	J	0.93	J	0.71	J
7440-43-9	**CADMIUM**	0.61	0.36	7	N	3.9	27	0.36	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		0.16	U	0.17	U	0.16	U	0.17	U	0.16	U	0.16	U	0.082	U
7440-70-2	CALCIUM	2590	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA		194	L	68.1		261	L	131	L	280	L	290	L	256	L
7440-47-3	CHROMIUM	60.1	26	12000	N	12000	2000000000	26	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		27 [PAL] [SSL]	L	10.5		26.9 [PAL] [SSL]	L	28.9 [PAL] [SSL]	L	30.9 [PAL] [SSL]		34.6 [PAL] [SSL]		16.8	
7440-48-4	COBALT	133	2.3	2.3	N	NA	NA	13	NC	NC	NC	NC	NC	NC	ORNL-R		4.3 [PAL] [ORNL]	J	2.3	L	13.6 [PAL] [ORNL] [SSL]	L	11.4 [PAL] [ORNL]	L	7.8 [PAL] [ORNL]	L	12.9 [PAL] [ORNL]	L	13.6 [PAL] [ORNL] [SSL]	L
7440-50-8	COPPER	48.6	28	310	N	310	11000	28	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		12.2	L	5		12.2	L	14	L	10.2	L	10.1	L	8.3	L
7439-89-6	IRON	83100	9500	5500	N	9500	NA	pH<5 or >8	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R		27500 [PAL] [ORNL] [MDRES]		15400 [PAL] [ORNL] [MDRES]		23700 [PAL] [ORNL] [MDRES]		30400 [PAL] [ORNL] [MDRES]		29400 [PAL] [ORNL] [MDRES]		30700 [PAL] [ORNL] [MDRES]		14700 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	400		400	NA	11	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		9.6	L	5		13.2 [PAL] [SSL]	L	18.8 [PAL] [SSL]	L	11.9 [PAL] [SSL]	L	13.3 [PAL] [SSL]	L	10.4	L
7439-93-2	**LITHIUM**	NA	2	16	N	NA	NA	NA	NA	2	NA	NC	NC	NC	ORNL Plant		**15.2 [PAL] [OPLNT]**	L	**7.4 [PAL] [OPLNT]**		**23 [PAL] [ORNL] [OPLNT]**	L	**33 [PAL] [ORNL] [OPLNT]**	L	**24.1 [PAL] [ORNL] [OPLNT]**	L	**24.3 [PAL] [ORNL] [OPLNT]**	L	**13.8 [PAL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	NA		NA	NA	NA	4400	NC	NC	NC	NC	NC	R3BTAG		2000		686		1890		2420		2210		2170		1040	
7439-96-5	MANGANESE	4130	160	180	N	160	950	220	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R		40		30.6	K	300 [PAL] [ORNL] [MDRES] [SSL]		197 [PAL] [ORNL] [MDRES]		127		218 [PAL] [ORNL] [MDRES]		722 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	MERCURY	0.18	0.058	2.3	N	2.3	NA	NA	0.06	NC	NC	NC	NC	NC	R3BTAG		0.0069	UL	0.0069	U	0.028	J	0.015	J	0.043	K	0.046	K	0.025	J
7440-02-0	NICKEL	18.2	38	150	N	160	NA	38	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		13	J	5.8	K	16.6	L	20 [BKG]	J	16.7	J	17	J	12	L
7440-09-7	POTASSIUM	2610	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA		2590	K	784	L	2260	K	3020 [BKG]	K	2150		2350		1270	
7782-49-2	SELENIUM	13.3	0.52	39	N	39	19	0.52	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		0.16	UL	0.16	U	0.16	UL	0.16	UL	0.066	UL	0.064	UL	0.065	UL
7440-22-4	SILVER	11.4	4.2	39	N	39	31	4.2	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		0.16	UL	0.17	U	0.16	UL	0.17	UL	0.16	U	0.16	U	0.082	U
7440-23-5	SODIUM	258	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA		93.9	K	25.9	J	64.3	K	108	K	108	L	108	L	27.5	L
7440-24-6	STRONTIUM	NA	120	4700	N	NA	NA	NA	120	NC	NC	NC	NC	NC	R3BTAG		10.6	L	3.9		9.3	L	10.4	L	10.6		11.1		7.5	
7440-31-5	**TIN**	NA	0.89	4700	N	4700	NA	NA	0.89	NC	NC	NC	NC	NC	R3BTAG		1.6	UL	1.7	U	1.6	UL	1.7	U	1.6	U	1.6	U	0.82	U
7440-62-2	VANADIUM	194	7.8	39	N	7.8	730	7.8	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R		36.9 [PAL] [MDRES] [SSL]	J	14.4 [PAL] [MDRES] [SSL]		40.9 [PAL] [ORNL] [MDRES] [SSL]	J	43.3 [PAL] [ORNL] [MDRES] [SSL]	J	54.6 [PAL] [ORNL] [MDRES] [SSL]		58.8 [PAL] [ORNL] [MDRES] [SSL]		28.7 [PAL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	2300	N	2300	14000	46	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL		37.5	L	17.5		50.3 [PAL] [SSL]	L	58 [PAL] [SSL]	L	51.4 [PAL] [SSL]	L	52.3 [PAL] [SSL]	L	33.9	L
	Miscellaneous																													
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						35.1		55.3							
TTNUS288	PERCENT MOISTURE (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						20.2		19.5							
TTNUS002	PH (S.U.)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						4.8		4.63							
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						2060	L	1450	L						
TTNUS046	TOTAL SOLIDS (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA						79.8		80.5							

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
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TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column16		column18		column20		column22		column23		column25		column28		column30		column32		column34	
	nsample			X05SB0040406		X05SB0050204		X05SB0050406		X05SB0060204		X05SB0060204-AVG		X05SB0060204-D		X05SB0060406		X05SB0070204		X05SB0070406		X05SB0080204	
	location			X05SB004		X05SB005		X05SB005		X05SB006		X05SB006		X05SB006		X05SB006		X05SB007		X05SB007		X05SB008	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0040406		X05SB0050204		X05SB0050406		X05SB0060204		X05SB0060204-AVG		FD031510-01		X05SB0060406		X05SB0070204		X05SB0070406		X05SB0080204	
	gis_date			20100314		20100315		20100315		20100315		20100315		20100315		20100315		20100315		20100315		20100315	
	qc_type			NM		NM		NM		NM		NM		FD		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate													X05SB0060204									
	top_depth			4.00	2.00			4.00	2.00			2.00	2.00			4.00	2.00			4.00	2.00		
	bottom_dep			6.00	4.00			6.00	4.00			4.00	4.00			6.00	4.00			6.00	4.00		
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			015		017		019		021		022		024		027		029		031		033	
cas	r	utl95conv	minorpal	c_015		c_017		c_019		c_021		c_022		c_024		c_027		c_029		c_031		c_033	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.23	U	0.25	U	0.25	U	0.245	U	0.24	U	0.25	U	0.24	U	0.24	U	0.24	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.23	U	0.25	U	0.25	U	0.245	U	0.24	U	0.25	U	0.24	U	0.24	U	0.24	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
2691-41-0	HMX	NA	380	0.2	U	0.18	UL	0.2	UL	0.2	UL	0.195	UL	0.19	UL	0.2	UL	0.19	UL	0.19	UL	0.19	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
78-11-5	PETN	NA	NA	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U
121-82-4	RDX	NA	5.5	0.2	U	0.18	U	0.2	U	0.2	U	0.195	U	0.19	U	0.2	U	0.19	U	0.19	U	0.19	U
479-45-8	TETRYL	NA	24	0.2	UJ	0.18	U	0.2	U	0.2	U	0.195	UJ	0.19	UJ	0.2	U	0.19	UJ	0.19	UJ	0.19	UJ
	Inorganics (mg/kg)																						
7429-90-5	**ALUMINUM**	35400	7700	**50800 [BKG] [PAL] [ORNL] [MDRES]**		14000 [PAL] [ORNL] [MDRES]		20400 [PAL] [ORNL] [MDRES]		33700 [PAL] [ORNL] [MDRES]		30900 [PAL] [ORNL] [MDRES]		28100 [PAL] [ORNL] [MDRES]		14700 [PAL] [ORNL] [MDRES]		21300 [PAL] [ORNL] [MDRES]		22900 [PAL] [ORNL] [MDRES]		16900 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.065	UL	0.033	UL	0.033	UL	0.032	UL	0.049	UL	0.066	UL	0.033	UL	0.033	UL	0.066	UL	0.032	UL
7440-38-2	ARSENIC	18.9	0.026	0.71 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.9 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	**BARIUM**	134	330	**254 [BKG] [PAL] [SSL]**	L	72.4	L	81.4	L	40.3	L	49.95	L	59.6	L	40.6	L	93.3	L	73.3	L	71.4	L
7440-41-7	BERYLLIUM	3.3	16	1.8		0.67	J	0.93	J	0.76	J	0.83	J	0.9	J	0.56	J	0.97	J	0.86	J	0.83	J
7440-43-9	**CADMIUM**	0.61	0.36	0.081	U	0.16	U	0.17	U	0.17	U	0.165	U	0.16	U	0.17	U	0.17	U	0.17	U	0.16	U
7440-70-2	CALCIUM	2590	NA	1340	L	232	L	275	L	87.7		104.35	L	121	L	111	L	263	L	203	L	351	L
7440-47-3	CHROMIUM	60.1	26	42 [PAL] [SSL]		19.3	L	27.8 [PAL] [SSL]	L	22.9		25.35	L	27.8 [PAL] [SSL]	L	19.3	L	28.8 [PAL] [SSL]	L	27.1 [PAL] [SSL]	L	26.4 [PAL] [SSL]	L
7440-48-4	COBALT	133	2.3	6 [PAL] [ORNL]	L	14.8 [PAL] [ORNL] [SSL]	L	12 [PAL] [ORNL]	L	4.7 [PAL] [ORNL]	L	5.4 [PAL] [ORNL]	L	6.1 [PAL] [ORNL]	L	6.1 [PAL] [ORNL]	L	15.2 [PAL] [ORNL] [SSL]	L	13.9 [PAL] [ORNL] [SSL]	L	11.8 [PAL] [ORNL]	L
7440-50-8	COPPER	48.6	28	17.9	L	7.1	L	11.4	L	13.5		13.65	L	13.8	L	10.1	L	11	L	13.1	L	11.6	L
7439-89-6	IRON	83100	9500	10700 [PAL] [ORNL] [MDRES]		15400 [PAL] [ORNL] [MDRES]		25600 [PAL] [ORNL] [MDRES]		27900 [PAL] [ORNL] [MDRES]		27950 [PAL] [ORNL] [MDRES]		28000 [PAL] [ORNL] [MDRES]		17900 [PAL] [ORNL] [MDRES]		22700 [PAL] [ORNL] [MDRES]		25400 [PAL] [ORNL] [MDRES]		23800 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	15.5 [PAL] [SSL]	L	13.3 [PAL] [SSL]	L	12.5 [PAL] [SSL]	L	10.6		10.7	L	10.8	L	9.2	L	13.2 [PAL] [SSL]	L	11.5 [PAL] [SSL]	L	11.2 [PAL] [SSL]	L
7439-93-2	**LITHIUM**	NA	2	**41 [PAL] [ORNL] [OPLNT]**	L	**15 [PAL] [OPLNT]**	L	**20.2 [PAL] [ORNL] [OPLNT]**	L	**17.2 [PAL] [ORNL] [OPLNT]**	L	**19.55 [PAL] [ORNL] [OPLNT]**	L	**21.9 [PAL] [ORNL] [OPLNT]**	L	**14.7 [PAL] [OPLNT]**	L	**20.4 [PAL] [ORNL] [OPLNT]**	L	**21.5 [PAL] [ORNL] [OPLNT]**	L	**19.5 [PAL] [ORNL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	2740 [BKG]		1230		3010 [BKG]		1900		1669		1830		1170		2060		2450		2650 [BKG]	
7439-96-5	MANGANESE	4130	160	165 [PAL] [MDRES]		598 [PAL] [ORNL] [MDRES] [SSL]		300 [PAL] [ORNL] [MDRES] [SSL]		68	K	77.9	K	87.8		95.6		664 [PAL] [ORNL] [MDRES] [SSL]		349 [PAL] [ORNL] [MDRES] [SSL]		369 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	MERCURY	0.18	0.058	0.073 [PAL] [BTAG]	K	0.022	J	0.007	UL	0.014	U	0.0125	J	0.018	J	0.018	J	0.036	J	0.039	J	0.02	L
7440-02-0	NICKEL	18.2	38	25 [BKG]	L	12.7	J	18.8 [BKG]	J	13		14.2	L	15.4	L	10.9	L	17.4	L	16.3	L	16	L
7440-09-7	POTASSIUM	2610	NA	4180 [BKG]		1380	K	1820	K	1390	J	2055	J	2720 [BKG]	J	1720	J	2200	K	2070	K	2120	K
7782-49-2	SELENIUM	13.3	0.52	0.065	UL	0.16	UL	0.17	UL	0.16	U	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	0.12	J	0.16	UL	0.17	UL	0.17	U	0.165	UL	0.16	UL	0.17	UL	0.17	UL	0.17	UL	0.16	UL
7440-23-5	SODIUM	258	NA	184	L	39.2	J	64.9	K	31.4	J	49	J	66.6	K	41.3	J	66.1	K	92.3	K	168	K
7440-24-6	STRONTIUM	NA	120	27.6		7.2	L	9.8	L	5.5		7.15	L	8.8	L	6.1	L	10	L	8.9	L	10.4	L
7440-31-5	**TIN**	NA	0.89	**1.5 [PAL] [BTAG]**	J	1.7	UL	1.7	U	1.7	U	1.65	UL	1.6	UL	1.7	UL	1.7	UL	1.7	UL	1.7	UL
7440-62-2	VANADIUM	194	7.8	63.1 [PAL] [ORNL] [MDRES] [SSL]		29.7 [PAL] [MDRES] [SSL]	J	45.4 [PAL] [ORNL] [MDRES] [SSL]	J	29.7 [PAL] [MDRES] [SSL]		33.45 [PAL] [MDRES] [SSL]	J	37.2 [PAL] [MDRES] [SSL]	J	25.7 [PAL] [MDRES] [SSL]	J	44.2 [PAL] [ORNL] [MDRES] [SSL]	J	44.4 [PAL] [ORNL] [MDRES] [SSL]	J	42.3 [PAL] [ORNL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46	**78.7 [BKG] [PAL] [SSL]**	L	39.3	L	51.8 [PAL] [SSL]	L	35.5		37.5	L	39.5	L	30.6	L	50.4 [PAL] [SSL]	L	48.2 [PAL] [SSL]	L	42.1	L
	Miscellaneous																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.u.)	NA	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																				
TTNUS046	TOTAL SOLIDS (%)	NA	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column36		column38		column40		column42		column44		column46		column48		column50		column52		column54	
	nsample			X05SB0080406		X05SB0090204		X05SB0090406		X05SB0100204		X05SB0100406		X05SB0110204		X05SB0110406		X05SB0120204		X05SB0120406		X05SB0130204	
	location			X05SB008		X05SB009		X05SB009		X05SB010		X05SB010		X05SB011		X05SB011		X05SB012		X05SB012		X05SB013	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0080406		X05SB0090204		X05SB0090406		X05SB0100204		X05SB0100406		X05SB0110204		X05SB0110406		X05SB0120204		X05SB0120406		X05SB0130204	
	gis_date			20100315		20100314		20100314		20100315		20100315		20100315		20100315		20100314		20100314		20100314	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																						
	top_depth			4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			035		037		039		041		043		045		047		049		051		053	
cas	r	utl95conv	minorpal	c_035		c_037		c_039		c_041		c_043		c_045		c_047		c_049		c_051		c_053	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.19	UL	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2	UL	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.19	UJ	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	**ALUMINUM**	35400	7700	20600 [PAL] [ORNL] [MDRES]		31500 [PAL] [ORNL] [MDRES]		**37700 [BKG] [PAL] [ORNL] [MDRES]**		32500 [PAL] [ORNL] [MDRES]		28700 [PAL] [ORNL] [MDRES]		**41600 [BKG] [PAL] [ORNL] [MDRES]**		**35600 [BKG] [PAL] [ORNL] [MDRES]**		29000 [PAL] [ORNL] [MDRES]		18400 [PAL] [ORNL] [MDRES]		29800 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.032	UL	0.032	UL	0.033	UL	0.032	UL	0.032	UL	0.033	UL	0.032	UL	0.065	UL	0.066	UL
7440-38-2	ARSENIC	18.9	0.026	3.3 [PAL] [ORNL] [MDRES] [MDSGW]		3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.1 [PAL] [ORNL] [MDRES] [MDSGW]	L	3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.4 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	**BARIUM**	134	330	33.5	L	63.3		63.2		76.3		74.8		58.6		83.8		59.9	L	49.4	L	79.2	L
7440-41-7	BERYLLIUM	3.3	16	0.4	J	0.7	J	0.87	J	0.78	J	0.79		0.73	J	0.85		0.67	J	0.58		0.98	
7440-43-9	**CADMIUM**	0.61	0.36	0.083	U	0.17	U	0.16	U	0.16	U	0.083	U	0.32	J	0.083	U	0.16	U	0.081	U	0.16	U
7440-70-2	CALCIUM	2590	NA	178	L	235		354		140		193		143		191		192	L	77	L	274	L
7440-47-3	CHROMIUM	60.1	26	14.6	L	27 [PAL] [SSL]		24.6		27.1 [PAL] [SSL]		24.4		26.5 [PAL] [SSL]		24.9		22.5		17.8		27.9 [PAL] [SSL]	
7440-48-4	COBALT	133	2.3	4.1 [PAL] [ORNL]	L	3.1 [PAL] [ORNL]	L	6.4 [PAL] [ORNL]		4.5 [PAL] [ORNL]		6.6 [PAL] [ORNL]		6.4 [PAL] [ORNL]		9.6 [PAL] [ORNL]		9.8 [PAL] [ORNL]	L	4.6 [PAL] [ORNL]	L	8 [PAL] [ORNL]	L
7440-50-8	COPPER	48.6	28	5.9	L	13.4		13.6		12.2		13.4		14.1		13.2		12.1	L	8.8	L	13.5	L
7439-89-6	IRON	83100	5500	12800 [PAL] [ORNL] [MDRES]		18200 [PAL] [ORNL] [MDRES]		23000 [PAL] [ORNL] [MDRES]		21300 [PAL] [ORNL] [MDRES]		14000 [PAL] [ORNL] [MDRES]		20700 [PAL] [ORNL] [MDRES]		15100 [PAL] [ORNL] [MDRES]		20300 [PAL] [ORNL] [MDRES]		17100 [PAL] [ORNL] [MDRES]		24900 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	12 [PAL] [SSL]	L	10.9		13.3 [PAL] [SSL]		11.2 [PAL] [SSL]		10.6		13.3 [PAL] [SSL]		12.1 [PAL] [SSL]		9.8	L	8.8	L	12.2 [PAL] [SSL]	L
7439-93-2	**LITHIUM**	NA	2	**9 [PAL] [OPLNT]**	L	**23.2 [PAL] [ORNL] [OPLNT]**		**23 [PAL] [ORNL] [OPLNT]**		**21.6 [PAL] [ORNL] [OPLNT]**		**21.8 [PAL] [ORNL] [OPLNT]**		**23.2 [PAL] [ORNL] [OPLNT]**		**28.3 [PAL] [ORNL] [OPLNT]**		**18.4 [PAL] [ORNL] [OPLNT]**	L	**14.3 [PAL] [OPLNT]**	L	**24.5 [PAL] [ORNL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400	1420		1520		2170		1690		2220		2390		2500		2120		1210		2480	
7439-96-5	MANGANESE	4130	160	105		42.9	K	91.5	K	30	K	47.4	K	57.3	K	84.9	K	191 [PAL] [ORNL] [MDRES]		133		143	
7439-97-6	MERCURY	0.18	0.058	0.016	J	0.04	K	0.026	K	0.011	J	0.0076	J	0.0068	U	0.0075	J	0.021	J	0.014	U	0.014	U
7440-02-0	NICKEL	18.2	38	7.7	J	10.1		15.4		11.4		15.2		15.2		19.2 [BKG]		13.9	L	9.9	L	17.1	L
7440-09-7	POTASSIUM	2610	NA	983	K	2950 [BKG]	L	2140	L	2660 [BKG]	L	2220	L	1930	L	2780 [BKG]	L	1730		1580		3120 [BKG]	
7782-49-2	SELENIUM	13.3	0.52	0.16	UL	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.064	UL	0.033	UL	0.066	UL
7440-22-4	SILVER	11.4	4.2	0.083	UL	0.17	U	0.16	U	0.16	U	0.083	U	0.16	U	0.083	U	0.16	U	0.081	U	0.16	U
7440-23-5	SODIUM	258	NA	94.3	K	77.1		53.5		93.1		98.5		72.8		112		68.3	L	78.9	L	73.1	L
7440-24-6	STRONTIUM	NA	120	5.2	L	13.2		12.8		11.3		10.9		9.2		13.7		7.8		5.3		12.1	
7440-31-5	**TIN**	NA	0.89	0.83	UL	1.7	U	1.7	U	1.7	U	0.83	U	1.6	U	0.83	U	1.6	U	0.81	U	1.6	U
7440-62-2	VANADIUM	194	7.8	21.9 [PAL] [MDRES] [SSL]	J	39.1 [PAL] [ORNL] [MDRES] [SSL]		33.7 [PAL] [MDRES] [SSL]		37.7 [PAL] [MDRES] [SSL]		31.1 [PAL] [MDRES] [SSL]		33.7 [PAL] [MDRES] [SSL]		34.2 [PAL] [MDRES] [SSL]		39.4 [PAL] [ORNL] [MDRES] [SSL]		30.7 [PAL] [MDRES] [SSL]		42.1 [PAL] [ORNL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	21	L	27.8		52.5 [PAL] [SSL]		31.9		45.7		43.8		59.5 [PAL] [SSL]		38.9	L	27.6	L	45.9	L
	Miscellaneous																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U.)	NA	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																				
TTNUS046	TOTAL SOLIDS (%)	NA	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column56		column58		column60		column62		column64		column66		column68		column70		column72		column74	
	nsample			X05SB0130406		X05SB0140204		X05SB0140406		X05SB0150204		X05SB0150406		X05SB0160204		X05SB0160406		X05SB0170204		X05SB0170406		X05SB0180204	
	location			X05SB013		X05SB014		X05SB014		X05SB015		X05SB015		X05SB016		X05SB016		X05SB017		X05SB017		X05SB018	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0130406		X05SB0140204		X05SB0140406		X05SB0150204		X05SB0150406		X05SB0160204		X05SB0160406		X05SB0170204		X05SB0170406		X05SB0180204	
	gis_date			20100314		20100314		20100314		20100314		20100314		20100314		20100314		20100314		20100314		20100314	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																						
	top_depth			4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			6.00		4.00		4.00		4.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			055		057		059		061		063		065		067		069		071		073	
cas	r	utl95conv	minorpal	c 055		c 057		c 059		c 061		c 063		c 065		c 067		c 069		c 071		c 073	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UL	0.2	UL	0.2	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	0.12	J	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Inorganics (mg/kg)																						
7429-90-5	**ALUMINUM**	35400	7700	9500 [PAL] [ORNL] [MDRES]		27600 [PAL] [ORNL] [MDRES]		27800 [PAL] [ORNL] [MDRES]		18000 [PAL] [ORNL] [MDRES]		32900 [PAL] [ORNL] [MDRES]		34400 [PAL] [ORNL] [MDRES]		25700 [PAL] [ORNL] [MDRES]		29700 [PAL] [ORNL] [MDRES]		22700 [PAL] [ORNL] [MDRES]		**43500 [BKG] [PAL] [ORNL] [MDRES]**	
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.032	UL	0.033	UL	0.033	UL	0.033	UL	0.032	UL	0.032	UL	0.066	UL	0.065	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	5.4 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.9 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	**BARIUM**	134	330	45.9		70.5		41.9		42		52.6		192 [BKG]		136 [BKG]		73.5		61.3		98.1	
7440-41-7	BERYLLIUM	3.3	16	0.82	J	0.88	J	0.59	J	0.56		0.8	J	1.2		1.1		0.87	J	0.77	J	1.3	
7440-43-9	**CADMIUM**	0.61	0.36	0.16	U	0.17	U	0.17	U	0.083	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.17	U
7440-70-2	CALCIUM	2590	NA	119		606		273		440		163		349	L	306	L	122	L	143	L	300	
7440-47-3	CHROMIUM	60.1	26	28.3 [PAL] [SSL]		26.8 [PAL] [SSL]		22.6		17.4		23.1		31.3 [PAL] [SSL]		31.4 [PAL] [SSL]		23.5		21.1		29.1 [PAL] [SSL]	
7440-48-4	COBALT	133	2.3	12.1 [PAL] [ORNL]		8.9 [PAL] [ORNL]		4.4 [PAL] [ORNL]		6.2 [PAL] [ORNL]		22.3 [PAL] [ORNL] [SSL]		9.1 [PAL] [ORNL]	L	7.4 [PAL] [ORNL]	L	18 [PAL] [ORNL] [SSL]	L	8.9 [PAL] [ORNL]	L	15.1 [PAL] [ORNL] [SSL]	
7440-50-8	COPPER	48.6	28	14.3		15.2		12.2		9.2		11.7	L	18	L	16.4	L	12.3	L	11.2	L	13.4	
7439-89-6	IRON	83100	9500	24100 [PAL] [ORNL] [MDRES]		19400 [PAL] [ORNL] [MDRES]		22600 [PAL] [ORNL] [MDRES]		15600 [PAL] [ORNL] [MDRES]		24700 [PAL] [ORNL] [MDRES]		21700 [PAL] [ORNL] [MDRES]		20700 [PAL] [ORNL] [MDRES]		24400 [PAL] [ORNL] [MDRES]		28600 [PAL] [ORNL] [MDRES]		21200 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	7.8		12.1 [PAL] [SSL]		9.4		8.5		14.1 [PAL] [SSL]		14 [PAL] [SSL]	L	14.4 [PAL] [SSL]	L	12.3 [PAL] [SSL]	L	9.8	L	11.2 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	**16.1 [PAL] [ORNL] [OPLNT]**		**23.9 [PAL] [ORNL] [OPLNT]**		**18.5 [PAL] [ORNL] [OPLNT]**		**14.7 [PAL] [OPLNT]**		**17 [PAL] [ORNL] [OPLNT]**		**35.3 [PAL] [ORNL] [OPLNT]**	L	**33.4 [PAL] [ORNL] [OPLNT]**	L	**22.7 [PAL] [ORNL] [OPLNT]**	L	**17.5 [PAL] [ORNL] [OPLNT]**	L	**31.1 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1710		2160		1010		1010		1560		2630		2460		1870		2050		2930 [BKG]	
7439-96-5	MANGANESE	4130	160	216 [PAL] [ORNL] [MDRES]	K	130	K	65.3	K	77.7	K	521 [PAL] [ORNL] [MDRES] [SSL]	K	54.7		42.7		439 [PAL] [ORNL] [MDRES] [SSL]		258 [PAL] [ORNL] [MDRES] [SSL]		207 [PAL] [ORNL] [MDRES]	K
7439-97-6	MERCURY	0.18	0.058	0.011	J	0.039	K	0.042	K	0.015	J	0.021	K	0.017	J	0.012	J	0.014	U	0.014	U	0.0076	J
7440-02-0	NICKEL	18.2	38	12.7		16		8.2		9.9		13.3	K	20.9 [BKG]	L	18	L	17.9	L	14.1	J	20.5 [BKG]	
7440-09-7	POTASSIUM	2610	NA	2470	L	2420	L	1810	L	1440	L	1780	L	2980 [BKG]		3290 [BKG]		2240		1880		3640 [BKG]	L
7782-49-2	SELENIUM	13.3	0.52	0.033	U	0.032	U	0.033	U	0.033	U	0.16	U	0.065	UL	0.064	UL	0.066	UL	0.065	UL	0.16	U
7440-22-4	SILVER	11.4	4.2	0.16	U	0.17	U	0.17	U	0.083	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.17	U
7440-23-5	SODIUM	258	NA	43	J	163		58		33.5		47.8	J	465 [BKG]	L	381 [BKG]	L	102	L	248	L	260 [BKG]	
7440-24-6	STRONTIUM	NA	120	6.3		11.8		7.6		5.6		7.2		13.5		13.9		8.9		8.5		16	
7440-31-5	**TIN**	NA	0.89	1.6	U	1.7	U	1.7	U	0.83	U	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.7	U
7440-62-2	VANADIUM	194	7.8	39 [PAL] [MDRES] [SSL]		35 [PAL] [MDRES] [SSL]		29.2 [PAL] [MDRES] [SSL]		26.8 [PAL] [MDRES] [SSL]		34.3 [PAL] [MDRES] [SSL]		41.7 [PAL] [ORNL] [MDRES] [SSL]		42 [PAL] [ORNL] [MDRES] [SSL]		38 [PAL] [MDRES] [SSL]		29.8 [PAL] [MDRES] [SSL]		40.7 [PAL] [ORNL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	39.8		47 [PAL] [SSL]		24.5		30		36.4		67.1 [PAL] [SSL]	L	50.6 [PAL] [SSL]	L	45.8	L	39	L	60.7 [PAL] [SSL]	
	Miscellaneous																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.u.)	NA	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																				
TTNUS046	TOTAL SOLIDS (%)	NA	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column76		column78		column80		column82		column84		column86		column88		column90		column91		column93	
	nsample			X05SB0180406		X05SB0190204		X05SB0190406		X05SB0200204		X05SB0200406		X05SB0210204		X05SB0210406		X05SB0220204		X05SB0220204-AVG		X05SB0220204-D	
	location			X05SB018		X05SB019		X05SB019		X05SB020		X05SB020		X05SB021		X05SB021		X05SB022		X05SB022		X05SB022	
	project_no			00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc			X05SB0180406		X05SB0190204		X05SB0190406		X05SB0200204		X05SB0200406		X05SB0210204		X05SB0210406		X05SB0220204		X05SB0220204-AVG		FD031410-02	
	gis_date			20100314		20100314		20100314		20100315		20100315		20100315		20100315		20100314		20100314		20100314	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM		NM		FD	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																					X05SB0220204	
	top_depth			4.00	2.00		4.00	2.00		4.00	2.00		4.00	2.00		4.00	2.00		2.00		2.00		2
	bottom_dep			6.00	4.00		6.00	4.00		6.00	4.00		6.00	4.00		6.00	4.00		4.00		4.00		4
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			075		077		079		081		083		085		087		089		090		092	
cas	r	utl95conv	minorpal	c 075		c 077		c 079		c 081		c 083		c 085		c 087		c 089		c 090		c 092	
	Explosives (mg/kg)																						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
99-65-0	1,3-DINITROBENZENE	0.75	610	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.11	J	0.05	J	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24	U	0.24	U	0.25	U	0.25	U	0.25	
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
2691-41-0	HMX	NA	380	0.2	U	0.2	U	0.2	U	0.2	UL	0.19	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	
	Inorganics (mg/kg)																						
7429-90-5	**ALUMINUM**	35400	7700	30600 [PAL] [ORNL] [MDRES]		24400 [PAL] [ORNL] [MDRES]		31900 [PAL] [ORNL] [MDRES]		9170 [PAL] [ORNL] [MDRES]		12200 [PAL] [ORNL] [MDRES]		15800 [PAL] [ORNL] [MDRES]		3320		16400 [PAL] [ORNL] [MDRES]		15350 [PAL] [ORNL] [MDRES]		14300 [PAL] [ORNL] [MDRES]	
7440-36-0	ANTIMONY	1.8	0.27	0.032	UL	0.032	UL	0.033	UL	0.033	UL	0.059	J	0.033	UL	0.032	UL	0.033	UL	0.0325	UL	0.032	
7440-38-2	ARSENIC	18.9	0.026	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	4.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	1.7 [PAL] [ORNL] [MDRES] [MDSGW]		2.4 [PAL] [ORNL] [MDRES] [MDSGW]		1.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	0.61 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.3 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	
7440-39-3	**BARIUM**	134	330	71.9		64.4		63.7		41.8	L	57.6	L	30.9		54.8		112	L	98	L	84	L
7440-41-7	BERYLLIUM	3.3	16	0.72		0.83	J	0.76	J	0.72	L	0.66	L	0.4	J	0.56		1		0.95	J	0.9	
7440-43-9	**CADMIUM**	0.61	0.36	0.081	U	0.16	U	0.17	U	0.56 [PAL] [SSL]	J	**8.5 [BKG] [PAL] [ORNL] [MDRES] [SSL]**	J	0.083	U	0.38 [PAL] [SSL]	K	0.16	U	0.165	U	0.17	
7440-70-2	CALCIUM	2590	NA	302		429		284		2130	L	1490	L	763		720		314	L	325	L	336	
7440-47-3	CHROMIUM	60.1	26	21.9		25.6		30.3 [PAL] [SSL]		16.2	L	18.4	L	13.9		15.9		27.2 [PAL] [SSL]		28.05 [PAL] [SSL]		28.9 [PAL] [SSL]	
7440-48-4	COBALT	133	2.3	6.3 [PAL] [ORNL]		10.4 [PAL] [ORNL]		9.4 [PAL] [ORNL]		6.4 [PAL] [ORNL]	L	8.8 [PAL] [ORNL]	L	5.3 [PAL] [ORNL]		7.9 [PAL] [ORNL]		14.6 [PAL] [ORNL] [SSL]	L	11.75 [PAL] [ORNL]	L	8.9 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	11.9		12.3		13.4		19.8	L	19.2	L	13.6		25.2		11.5	L	13	L	14.5	
7439-89-6	IRON	83100	9500	12300 [PAL] [ORNL] [MDRES]		23200 [PAL] [ORNL] [MDRES]		20400 [PAL] [ORNL] [MDRES]		13300 [PAL] [ORNL] [MDRES]		14500 [PAL] [ORNL] [MDRES]		13200 [PAL] [ORNL] [MDRES]		11900 [PAL] [ORNL] [MDRES]		22300 [PAL] [ORNL] [MDRES]		24550 [PAL] [ORNL] [MDRES]		26800 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	8.5		11.1 [PAL] [SSL]		9.2		11.6 [PAL] [SSL]	L	12.7 [PAL] [SSL]	L	9.9		21.4 [PAL] [SSL]		13.7 [PAL] [SSL]	L	13.35 [PAL] [SSL]	L	13 [PAL] [SSL]	
7439-93-2	**LITHIUM**	NA	2	**24.4 [PAL] [ORNL] [OPLNT]**		**21.3 [PAL] [ORNL] [OPLNT]**		**21.4 [PAL] [ORNL] [OPLNT]**		**8.7 [PAL] [OPLNT]**	L	**13.4 [PAL] [OPLNT]**	L	**11.6 [PAL] [OPLNT]**		**13.1 [PAL] [OPLNT]**		**21.5 [PAL] [ORNL] [OPLNT]**	L	**23.4 [PAL] [ORNL] [OPLNT]**	L	**25.3 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	2210		1930		2060		959		1310		730		972		1530		1645		1760	
7439-96-5	MANGANESE	4130	160	69.2	K	154	K	170 [PAL] [MDRES]	K	64.8		184 [PAL] [ORNL] [MDRES]		79	K	119	K	616 [PAL] [ORNL] [MDRES] [SSL]	J	452 [PAL] [ORNL] [MDRES] [SSL]	J	288 [PAL] [ORNL] [MDRES] [SSL]	
7439-97-6	MERCURY	0.18	0.058	0.013	J	0.019	K	0.011	J	0.043	J	0.04	J	0.014	J	0.013	J	0.025	J	0.0142	J	0.0068	
7440-02-0	NICKEL	18.2	38	17.8		15.5		20.3 [BKG]		11.2	L	12	L	7.8		9.8		17.1	L	17.05	L	17	
7440-09-7	POTASSIUM	2610	NA	2270	L	2360	L	2070	L	1080	K	1420	K	1030	L	1420	L	2600		2615 [BKG]	L	2630 [BKG]	
7782-49-2	SELENIUM	13.3	0.52	0.16	U	0.16	U	0.16	U	0.033	UL	0.16	UL	0.16	U	0.032	U	0.065	UL	0.0485	UL	0.032	
7440-22-4	SILVER	11.4	4.2	0.081	U	0.16	U	0.17	U	0.083	U	0.082	UL	0.083	U	0.082	U	0.16	U	0.165	UL	0.17	
7440-23-5	SODIUM	258	NA	190		60.5		59.3		36.6	K	39.7	K	21.5	J	36.3		60.7	L	68.05	L	75.4	
7440-24-6	STRONTIUM	NA	120	12.2		10.7		7.9		10.8	L	10	L	5.1		7.2		12		12.25		12.5	
7440-31-5	**TIN**	NA	0.89	0.81	U	1.6	U	1.7	U	0.83	UL	0.82	U	0.83	U	1.6	U	1.65	UL	1.7			
7440-62-2	VANADIUM	194	7.8	26.9 [PAL] [MDRES] [SSL]		39.9 [PAL] [ORNL] [MDRES] [SSL]		31.5 [PAL] [MDRES] [SSL]		28.6 [PAL] [MDRES] [SSL]	J	30 [PAL] [MDRES] [SSL]	J	20.7 [PAL] [MDRES] [SSL]		24.4 [PAL] [MDRES] [SSL]		42 [PAL] [ORNL] [MDRES] [SSL]		41.75 [PAL] [ORNL] [MDRES] [SSL]		41.5 [PAL] [ORNL] [MDRES] [SSL]	
7440-66-6	**ZINC**	70.4	46	52.4 [PAL] [SSL]		40.9		41		35.9	L	63.8 [PAL] [SSL]	L	37.4		42.8		46.1 [PAL] [SSL]	L	45.35	L	44.6	
	Miscellaneous																						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																				
TTNUS288	PERCENT MOISTURE (%)	NA	NA																				
TTNUS002	PH (S.U.)	NA	NA																				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																				
TTNUS046	TOTAL SOLIDS (%)	NA	NA																				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 7-5

SUBSURFACE SOIL SAMPLING RESULTS
ADVANCED IED AREA (UX0-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter				column96		column98		column100		column102		column104		column106		column108		column109		column111	
	nsample				X05SB0220406		X05SB0230204		X05SB0230406		X05SB0240204		X05SB0240406		X05SB0250204		X05SB0250406		X05SB0250406-AVG		X05SB0250406-D	
	location				X05SB022		X05SB023		X05SB023		X05SB024		X05SB024		X05SB025		X05SB025		X05SB025		X05SB025	
	project_no				00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061		00810_2010061	
	sample_coc				X05SB0220406		X05SB0230204		X05SB0230406		X05SB0240204		X05SB0240406		X05SB0250204		X05SB0250406		X05SB0250406-AVG		FD031510-02	
	gis_date				20100314		20100314		20100314		20100315		20100315		20100315		20100315		20100315		20100315	
	qc_type				NM		NM		NM		NM		NM		NM		NM		NM		FD	
	sacode				NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP	
	matrix				SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																				X05SB0250406	
	top_depth			.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00		4.00		4.00
	bottom_dep			.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00		6.00		6.00
	depth_unit				FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix				SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z				095		097		099		101		103		105		107		108		110	
cas	r	utl95conv	minorpal		c_095		c_097		c_099		c_101		c_103		c_105		c_107		c_108		c_110	
	Explosives (mg/kg)																					
99-35-4	1,3,5-TRINITROBENZENE	NA	9	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
99-65-0	1,3-DINITROBENZENE	0.75	610	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.245	U	0.24	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
88-72-2	2-NITROTOLUENE	NA	2.9	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
618-87-1	3,5-DINITROANILINE	NA	NA	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.245	U	0.24	U
99-08-1	3-NITROTOLUENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
99-99-0	4-NITROTOLUENE	NA	30	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
2691-41-0	HMX	NA	380	U	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.195	UL	0.19	UL
98-95-3	NITROBENZENE	NA	0.023	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
55-63-0	NITROGLYCERIN	NA	0.61	U	1.2	U	1.2	U	1.2	U	0.084	J	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19	U
479-45-8	TETRYL	NA	24	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	UJ	0.2	UJ	0.195	UJ	0.19	U
	Inorganics (mg/kg)																					
7429-90-5	**ALUMINUM**	35400	7700		19100 [PAL] [ORNL] [MDRES]		20100 [PAL] [ORNL] [MDRES]		22200 [PAL] [ORNL] [MDRES]		12000 [PAL] [ORNL] [MDRES]		17500 [PAL] [ORNL] [MDRES]		22600 [PAL] [ORNL] [MDRES]		13100 [PAL] [ORNL] [MDRES]	J	19200 [PAL] [ORNL] [MDRES]	J	25300 [PAL] [ORNL] [MDRES]	J
7440-36-0	ANTIMONY	1.8	0.27	UL	0.033	UL	0.033	UL	0.065	UL	0.064	UL	0.065	UL	0.063	UL	0.066	UL	0.0655	UL	0.065	UL
7440-38-2	ARSENIC	18.9	0.026	J	4 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.6 [PAL] [ORNL] [MDRES] [MDSGW]	L	4 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.7 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.2 [PAL] [ORNL] [MDRES] [MDSGW]	L	3.1 [PAL] [ORNL] [MDRES] [MDSGW]	L
7440-39-3	**BARIUM**	134	330		53.5	L	58.6	L	72.2	L	35.1	L	39.5	L	64.1	L	63.7	L	57.9	L	52.1	L
7440-41-7	BERYLLIUM	3.3	16	J	0.54	J	0.81	J	0.88	J	0.59	J	0.65	J	0.81	J	0.73	J	0.68	J	0.63	J
7440-43-9	**CADMIUM**	0.61	0.36	U	0.16	U	0.16	U	0.16	U	0.17	U	0.16	U	0.16	U	0.17	U	0.165	U	0.16	U
7440-70-2	CALCIUM	2590	NA		130	L	171	L	194	L	108	L	131	L	218	L	161	L	143.5	L	126	L
7440-47-3	CHROMIUM	60.1	26		23		26.2 [PAL] [SSL]		26.6 [PAL] [SSL]		21.5	L	23.9	L	24.6	L	24.9	L	22.85	L	20.8	L
7440-48-4	COBALT	133	2.3		4.2 [PAL] [ORNL]	L	13 [PAL] [ORNL]	L	13.2 [PAL] [ORNL] [SSL]	L	6.4 [PAL] [ORNL]	L	23.5 [PAL] [ORNL] [SSL]	L	12.2 [PAL] [ORNL]	L	8.3 [PAL] [ORNL]	L	8.7 [PAL] [ORNL]	L	9.1 [PAL] [ORNL]	L
7440-50-8	COPPER	48.6	28		11.5	L	11.4	L	12.6	L	9.5	L	10	L	11	L	10.9	L	10.55	L	10.2	L
7439-89-6	IRON	83100	9500		20400 [PAL] [ORNL] [MDRES]		20700 [PAL] [ORNL] [MDRES]		23300 [PAL] [ORNL] [MDRES]		15500 [PAL] [ORNL] [MDRES]		17000 [PAL] [ORNL] [MDRES]		22500 [PAL] [ORNL] [MDRES]		22000 [PAL] [ORNL] [MDRES]		21200 [PAL] [ORNL] [MDRES]		20400 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11		8	L	10.7	L	11.3 [PAL] [SSL]	L	8.5	L	9.8	L	10.7	L	10	L	9.75	L	9.5	L
7439-93-2	**LITHIUM**	NA	2		**16.6 [PAL] [ORNL] [OPLNT]**	L	**19.3 [PAL] [ORNL] [OPLNT]**	L	**22.5 [PAL] [ORNL] [OPLNT]**	L	**13.8 [PAL] [OPLNT]**	L	**14 [PAL] [OPLNT]**	L	**18.5 [PAL] [ORNL] [OPLNT]**	L	**19.7 [PAL] [ORNL] [OPLNT]**	L	**18.55 [PAL] [ORNL] [OPLNT]**	L	**17.4 [PAL] [ORNL] [OPLNT]**	L
7439-95-4	MAGNESIUM	2640	4400		1110		1690		2360		1090		1210		1890		1900		1790		1680	
7439-96-5	MANGANESE	4130	160	J	49.1		293 [PAL] [ORNL] [MDRES] [SSL]		327 [PAL] [ORNL] [MDRES] [SSL]		54.5		211 [PAL] [ORNL] [MDRES]		248 [PAL] [ORNL] [MDRES] [SSL]		194 [PAL] [ORNL] [MDRES]		204 [PAL] [ORNL] [MDRES]		214 [PAL] [ORNL] [MDRES]	
7439-97-6	MERCURY	0.18	0.058	U	0.022	J	0.0083	J	0.014	U	0.0075	J	0.011	J	0.028	J	0.013	J	0.0135	J	0.014	J
7440-02-0	NICKEL	18.2	38		8.8	L	13.8	L	18.7 [BKG]	L	8.6	L	10.7	L	15.4	L	14.6	L	13.75	L	12.9	L
7440-09-7	POTASSIUM	2610	NA	L	2380		2290		1930		1410	K	1530	K	1960	K	1980	K	1660	K	1340	K
7782-49-2	SELENIUM	13.3	0.52	U	0.033	UL	0.065	UL	0.065	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL	0.16	UL
7440-22-4	SILVER	11.4	4.2	UL	0.16	U	0.16	U	0.16	U	0.17	UL	0.16	UL	0.16	UL	0.17	UL	0.165	UL	0.16	U
7440-23-5	SODIUM	258	NA		49.2	J	66.7	L	116	L	32.8	J	39.7	J	57.1	K	68.7	K	58.25	J	47.8	J
7440-24-6	STRONTIUM	NA	120		7.8		8.5		8.7		5.1	L	5.4	L	8.4	L	7.6	L	6.7	L	5.8	L
7440-31-5	**TIN**	NA	0.89	UL	1.6	U	1.6	U	1.6	U	1.7	UL	1.6	UL	1.7	UL	1.7	UL	1.65	UL	1.6	U
7440-62-2	VANADIUM	194	7.8		34.3 [PAL] [MDRES] [SSL]		38.9 [PAL] [MDRES] [SSL]		40.8 [PAL] [ORNL] [MDRES] [SSL]		27 [PAL] [MDRES] [SSL]	J	30.1 [PAL] [MDRES] [SSL]	J	39.5 [PAL] [ORNL] [MDRES] [SSL]	J	37.3 [PAL] [MDRES] [SSL]	J	34.65 [PAL] [MDRES] [SSL]	J	32 [PAL] [MDRES] [SSL]	J
7440-66-6	**ZINC**	70.4	46		27	L	38.4	L	49.1 [PAL] [SSL]	L	26.6	L	29.5	L	43.5	L	40.3	L	38.45	L	36.6	L
	Miscellaneous																					
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA																			
TTNUS288	PERCENT MOISTURE (%)	NA	NA																			
TTNUS002	PH (S.U.)	NA	NA																			
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66500	NA																			
TTNUS046	TOTAL SOLIDS (%)	NA	NA																			

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 8-4

SURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter													a01		a03		a09		a11		a21		a23
	z													001		003		009		011		021		023
	nsample													X10SD0010006		X10SD0010024		X10SD0020006		X10SD0020024		X10SD0030006		X10SD003(
	location													X10SD001		X10SD001		X10SD002		X10SD002		X10SD003		X10SD003
	project_no													00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_201
	sample_coc													X10SD0010006		X10SD0010024		X10SD0020006		X10SD0020024		X10SD0030006		X10SD003(
	sample_dat													20100126		20100126		20100125		20100125		20100125		20100125
	matrix													SD		SD		SD		SD		SD		SD
	duplicate																							
	top_depth													0		0		0		0		0		
	bottom_dep													0.5		2		0.5		2		0.5		
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	c_001		c_003		c_009		c_011		c_021		c_023
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	0.24	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.24	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
99-99-0	4-NITROTOLUENE	0.21	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	UJ	1.2	U	0.34	J	1.2
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	0.19	U	0.2	UL	0.2	U	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	0.19	U	0.2	UL	0.2	U	0.2	U	0.2	U	0.2
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indica

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

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TABLE 8-4

SURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter																							
	z																							
	nsample													0024										
	location														X10SD004		X10SD004		X10SD005		X10SD005		X10SD006	
	project_no													0042	00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc													0024	X10SD0040006		X10SD0040024		X10SD0050006		X10SD0050024		X10SD0060006	
	sample_dat														20100126		20100126		20100126		20100126		20100126	
	matrix														SD		SD		SD		SD		SD	
	duplicate																							
	top_depth													0	0		0		0		0		0	
	bottom_dep													2	0.5		2		0.5		2		0.5	
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant		c_029		c_031		c_037		c_039		c_045	
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	1.2	U	0.32	J	1.2	UJ	1.2	U
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indica

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

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TABLE 8-4

SURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter													a47		a53		a55		a61		a63		a69
	z													047		053		055		061		063		069
	nsample													X10SD0060024		X10SD0070006		X10SD0070024		X10SD0080006		X10SD0080024		X10SD009(
	location													X10SD006		X10SD007		X10SD007		X10SD008		X10SD008		X10SD009
	project_no													00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_201
	sample_coc													X10SD0060024		X10SD0070006		X10SD0070024		X10SD0080006		X10SD0080024		X10SD009(
	sample_dat													20100126		20100126		20100126		20100202		20100202		20100202
	matrix													SD		SD		SD		SD		SD		SD
	duplicate																							
	top_depth													0		0		0		0		0		
	bottom_dep													2		0.5		2		0.5		2		
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	c_047		c_053		c_055		c_061		c_063		c_069
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	0.25	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.25	U	0.24	U	0.25	U	0.25	UJ	0.25	UJ	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
99-99-0	4-NITROTOLUENE	0.21	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	0.2	U	0.19	U	0.2	U	0.2	UL	0.2	UL	0.2
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	0.087	J	1.2	UJ	0.3	J	1.2	UJ	1.2
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ	1.2
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indica

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 8-4

SURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter														a71		a72		a74		a81		a83	
	z														071		072		074		081		083	
	nsample													0006	X10SD0090024		X10SD0090024-AVG		X10SD0090024-D		X10SD0100006		X10SD0100024	
	location														X10SD009		X10SD009		X10SD009		X10SD010		X10SD010	
	project_no													0042	00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc													0006	X10SD0090024		X10SD0090024-AVG		FD020210-02		X10SD0100006		X10SD0100024	
	sample_dat														20100202		20100202		20100202		20100125		20100125	
	matrix														SD		SD		SD		SD		SD	
	duplicate																		X10SD0090024					
	top_depth													0		0		0		0		0		0
	bottom_dep													0.5		2		2		2		0.5		2
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant		c_071		c_072		c_074		c_081		c_083	
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.25	U	0.25	UJ	0.25	UJ	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	UJ	0.2	UJ	0.20	UJ	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	UL	0.2	UL	0.20	UL	0.2	UL	0.2	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	1.2	UJ	1.2	UJ	1.2	U	1.2	U
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	1.2	UJ	1.2	UJ	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	U	0.2	U	0.20	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
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Shading indica

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TABLE 8-4

SURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter													a87		a89		a95		a97		a031		a051
	z													087		089		095		097		103		105
	nsample													X10SD0110006		X10SD0110024		X10SD0120006		X10SD0120024		X10SD0130006		X10SD013(
	location													X10SD011		X10SD011		X10SD012		X10SD012		X10SD013		X10SD013
	project_no													00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_201
	sample_coc													X10SD0110006		X10SD0110024		X10SD0120006		X10SD0120024		X10SD0130006		X10SD013(
	sample_dat													20100127		20100127		20100127		20100127		20100202		20100202
	matrix													SD		SD		SD		SD		SD		SD
	duplicate																							
	top_depth													0		0		0		0		0		
	bottom_dep													0.5		2		0.5		2		0.5		
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	c_087		c_089		c_095		c_097		c_103		c_105
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.25	U	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
99-99-0	4-NITROTOLUENE	0.21	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	0.53	J	1.2	U	1.2	UJ	1.2
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	0.2	UR	0.2	UR	0.2	UR	0.2	UR	0.2	U	0.2
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
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SURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter																					
	z														a111		a131		a191		a211	
	nsample													0024	111 X10SD0140006		113 X10SD0140024		119 X10SD0150006		121 X10SD0150024	
	location														X10SD014		X10SD014		X10SD015		X10SD015	
	project_no													0042	00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc													0024	X10SD0140006		X10SD0140024		X10SD0150006		X10SD0150024	
	sample_dat														20100127		20100127		20100202		20100202	
	matrix														SD		SD		SD		SD	
	duplicate																					
	top_depth													0	0		0		0		0	
	bottom_dep													2	0.5		2		0.5		2	
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant		c_111		c_113		c_119		c_121	
	Explosives (mg/kg)																					
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.25	U	0.25	U	0.25	UJ	0.25	UJ
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	UJ	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	1.2	U	1.2	UJ	1.2	UJ
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	U	0.2	UR	0.2	UR	0.2	U	0.2	U
	Miscellaneous Parameters																					
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								175	
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								83.4	
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								16.6	
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								6.53	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								137000 [BKG]	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indica

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter													a05		a07		a13		a15		a16		a18
	z													005		007		013		015		016		018
	nsample													X10SD0010204		X10SD0010405		X10SD0020204		X10SD0020405		X10SD0020405-AVG		X10SD002(
	location													X10SD001		X10SD001		X10SD002		X10SD002		X10SD002		X10SD002
	project_no													00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_201
	sample_coc													X10SD0010204		X10SD0010405		X10SD0020204		X10SD0020405		X10SD0020405-AVG		FD012610-
	sample_dat													20100126		20100126		20100126		20100126		20100126		20100126
	matrix													SD		SD		SD		SD		SD		SD
	duplicate																							X10SD002(
	top_depth													2		4		2		4		4		
	bottom_dep													4		5		4		5		5		
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	c_005		c_007		c_013		c_015		c_016		c_018
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	0.25	U	0.25	U	0.25	U	0.25	U	0.245	U	0.24
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.25	U	0.25	U	0.25	U	0.25	U	0.245	U	0.24
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
99-99-0	4-NITROTOLUENE	NA	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
55-63-0	**NITROGLYCERIN**	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	0.2	U	0.2	U	0.2	U	0.2	U	0.195	U	0.19
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter																							
	z													a25		a27		a33		a35		a41		
	nsample												0405-D	025		027		033		035		041		
	location													X10SD0030204		X10SD0030405		X10SD0040204		X10SD0040405		X10SD0050204		
	project_no													X10SD003		X10SD003		X10SD004		X10SD004		X10SD005		
	sample_coc												0042	00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		
	sample_dat												01	X10SD0030204		X10SD0030405		X10SD0040204		X10SD0040405		X10SD0050204		
	matrix													20100126		20100126		20100126		20100126		20100126		
	duplicate													SD		SD		SD		SD		SD		
	top_depth												0405		2		4		2		4		2	
	bottom_dep												4		4		5		4		5		4	
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	5	c_025		c_027		c_033		c_035		c_041	
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	**NA**	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
99-65-0	1,3-DINITROBENZENE	**0.75**	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	U	0.45	U	0.23	U	0.25	U	0.24	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.45	U	0.23	U	0.25	U	0.24	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
55-63-0	**NITROGLYCERIN**	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	UJ	**0.91 [PAL] [ORNL]**	J	1.1	UJ	1.2	U	1.1	U	1.2	U
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	2.2	U	1.1	U	1.2	U	1.1	U	1.2	U
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	U	0.36	U	0.18	U	0.2	U	0.19	U	0.2	U
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.

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TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter													a43		a49		a51		a57		a59		a65
	z													043		049		051		057		059		065
	nsample													X10SD0050405		X10SD0060204		X10SD0060405		X10SD0070204		X10SD0070405		X10SD008
	location													X10SD005		X10SD006		X10SD006		X10SD007		X10SD007		X10SD008
	project_no													00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_201
	sample_coc													X10SD0050405		X10SD0060204		X10SD0060405		X10SD0070204		X10SD0070405		X10SD008
	sample_dat													20100126		20100126		20100126		20100126		20100126		20100202
	matrix													SD		SD		SD		SD		SD		SD
	duplicate																							
	top_depth													4		2		4		2		4		
	bottom_dep													5		4		5		4		5		
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	c_043		c_049		c_051		c_057		c_059		c_065
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.24	U	0.24	U	0.25	U	0.25	U	0.25	U	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
99-99-0	4-NITROTOLUENE	NA	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
55-63-0	**NITROGLYCERIN**	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	UJ	1.2	UJ	1.2	UJ	1.2	UJ	1.2
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter																							
	z														a67		a77		a79		a85		a91	
															067		077		079		085		091	
	nsample													0204	X10SD0080405		X10SD0090204		X10SD0090405		X10SD0100204		X10SD0110204	
	location														X10SD008		X10SD009		X10SD009		X10SD010		X10SD011	
	project_no													0042	00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
	sample_coc													0204	X10SD0080405		X10SD0090204		X10SD0090405		X10SD0100204		X10SD0110204	
	sample_dat														20100202		20100202		20100202		20100125		20100127	
	matrix														SD		SD		SD		SD		SD	
	duplicate																							
	top_depth													2		4		2		4		2		2
	bottom_dep													4		5		4		5		4		4
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant		c_067		c_077		c_079		c_085		c_091	
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	**NA**	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	**0.75**	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	UJ	0.2	UJ	0.2	UJ	0.2	UJ	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	UL	0.2	UL	0.2	UL	0.2	UL	0.2	U	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	**NITROGLYCERIN**	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	0.19	J	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UR
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter													a93		a99		a011		a071		a091		a151
	z													093		099		101		107		109		115
	nsample													X10SD0110405		X10SD0120204		X10SD0120405		X10SD0130204		X10SD0130405		X10SD014(
	location													X10SD011		X10SD012		X10SD012		X10SD013		X10SD013		X10SD014
	project_no													00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_201
	sample_coc													X10SD0110405		X10SD0120204		X10SD0120405		X10SD0130204		X10SD0130405		X10SD014(
	sample_dat													20100127		20100127		20100127		20100202		20100202		20100127
	matrix													SD		SD		SD		SD		SD		SD
	duplicate																							
	top_depth														4		2		4		2		4	
	bottom_dep														5		4		5		4		5	
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	c_093		c_099		c_101		c_107		c_109		c_115
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	**NA**	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	**0.75**	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.25	U	0.25	U	0.25	U	0.25	UJ	0.25	U	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	UJ	0.2
99-99-0	4-NITROTOLUENE	NA	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
55-63-0	**NITROGLYCERIN**	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	U	1.2
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.2	U	1.2	U	1.2	UJ	1.2	U	1.2
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	0.2	UR	0.2	UR	0.2	UR	0.2	U	0.2	U	0.2
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							232		109		
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							86.2		26.5		
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							13.8		73.5		
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							6.4		7.14		
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							**327000 [BKG]**		4820		

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.

Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 8-5

SUBSURFACE SOIL SAMPLING RESULTS
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter																							
	z																							
	nsample													0204										
	location														X10SD014									
	project_no													0042										
	sample_coc													0204										
	sample_dat																							
	matrix																							
	duplicate																							
	top_depth													2		4		2		2		2		4
	bottom_dep													4		5		4		4		4		6
cas	x	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant		a171		a231		a241		a261		a291	
															117		123		124		126		129	
															X10SD0140405		X10SD0150204		X10SD0150204-AVG		X10SD0150204-D		X10SD0150406	
															X10SD014		X10SD015		X10SD015		X10SD015		X10SD015	
															00810_2010042		00810_2010042		00810_2010042		00810_2010042		00810_2010042	
															X10SD0140405		X10SD0150204		X10SD0150204-AVG		FD020210-01		X10SD0150406	
															20100127		20100202		20100202		20100202		20100202	
															SD		SD		SD		SD		SD	
																					X10SD0150204			
															c_117		c_123		c_124		c_126		c_129	
	Explosives (mg/kg)																							
99-35-4	1,3,5-TRINITROBENZENE	**NA**	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	**0.75**	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	UJ	0.20	UJ	0.2	UJ	0.2	UJ
99-99-0	4-NITROTOLUENE	NA	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
55-63-0	**NITROGLYCERIN**	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	U	0.2	U	0.2	U	0.20	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	UR	0.2	UR	0.2	U	0.20	U	0.2	U	0.2	U
	Miscellaneous Parameters																							
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS291	PERCENT SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS002	PH (S.U.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											
TTNUS003	**TOTAL ORGANIC CARBON (mg/kg)**	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 9-4

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter													column2		column4		column6		column7		column9		column12	
	nsample													X12SB0010204		X12SB0010406		X12SB0020204		X12SB0020204-AVG		X12SB0020204-D		X12SB0030204	
	location													X12SB001		X12SB001		X12SB002		X12SB002		X12SB002		X12SB003	
	project_no													00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc													X12SB0010204		X12SB0010406		X12SB0020204		X12SB0020204-AVG		FD031010-01		X12SB0030204	
	gis_date													20100310		20100310		20100310		20100310		20100310		20100310	
	sacode													NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL	
	matrix													SO		SO		SO		SO		SO		SO	
	duplicate																					X12SB0020204			
	top_depth													2.00		4.00		2.00		2.00		2.00		2.00	
	bottom_dep													4.00		6.00		4.00		4.00		4.00		4.00	
	depth_unit													FT		FT		FT		FT		FT		FT	
	submatrix													SB		SB		SB		SB		SB		SB	
	z													001		003		005		006		008		011	
cas	x	utl95	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sun	suninv	lanlplant	c_001		c_003		c_005		c_006		c_008		c_011	
	Explosives (mg/kg)																								
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	19	NA	NA	NA	NA	NA	NA	6	12	NC	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.10	7.8	0.25	NA	NA	NA	NA	5	7	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.25	U	0.23	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	U	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	U	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters																								
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	52.3	J	72.2	J	61.4		61.4	J				
TTNUS288	PERCENT MOISTURE (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	17.5		20.7		18.2		18.2					
TTNUS002	PH (S.U.)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	4.35		4.92		4.22		4.22					
TTNUS002	TOTAL ORGANIC CARBON (mg/kg)	66500	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3820		65		63		63					
TTNUS046	TOTAL SOLIDS (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	82.5		79.3		81.8		81.8					

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 9-4

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column14		column16		column18		column20		column22		column24		column26		column28		column30		column32		column34	
	nsample			X12SB0030406		X12SB0040204		X12SB0040406		X12SB0050204		X12SB0050406		X12SB0020406		X12SB0060204		X12SB0060406		X12SB0070204		X12SB0070406		X12SB0080204	
	location			X12SB003		X12SB004		X12SB004		X12SB005		X12SB005		X12SB006		X12SB006		X12SB006		X12SB007		X12SB007		X12SB008	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X12SB0030406		X12SB0040204		X12SB0040406		X12SB0050204		X12SB0050406		X12SB0020406		X12SB0060204		X12SB0060406		X12SB0070204		X12SB0070406		X12SB0080204	
	gis_date			20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310		20100310	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																								
	top_depth			4.00		2.00		4.00		2.00		4.00		4.00		2.00		4.00		2.00		4.00		2.00	
	bottom_dep			6.00		4.00		6.00		4.00		6.00		6.00		4.00		6.00		4.00		6.00		4.00	
	depth_unit			FT		FT		FT		FT		FT		FT		FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB		SB		SB		SB	
	z			013		015		017		019		021		023		025		027		029		031		033	
cas	x	utl95	minorpal	c_013		c_015		c_017		c_019		c_021		c_023		c_025		c_027		c_029		c_031		c_033	
	Explosives (mg/kg)																								
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.23	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25	U	0.24	U	0.23	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	U	0.2	UL	0.2	UL	0.19	UL	0.19	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	0.26	J	1.2	U	0.25	J	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19	U	0.2	U
	Miscellaneous Parameters																								
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC																						
TTNUS288	PERCENT MOISTURE (%)	NA	NC																						
TTNUS002	PH (S.U.)	NA	NC																						
TTNUS002	TOTAL ORGANIC CARBON (mg/kg)	66500	NC																						
TTNUS046	TOTAL SOLIDS (%)	NA	NC																						

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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TABLE 9-4

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column36		column38		column40		column42		column44	
	nsample			X12SB0080406		X12SB0090204		X12SB0090406		X12SB0100204		X12SB0100406	
	location			X12SB008		X12SB009		X12SB009		X12SB010		X12SB010	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X12SB0080406		X12SB0090204		X12SB0090406		X12SB0100204		X12SB0100406	
	gis_date			20100310		20100310		20100310		20100310		20100310	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO	
	duplicate												
	top_depth			4.00		2.00		4.00		2.00		4.00	
	bottom_dep			6.00		4.00		6.00		4.00		6.00	
	depth_unit			FT		FT		FT		FT		FT	
	submatrix			SB		SB		SB		SB		SB	
	z			035		037		039		041		043	
cas	x	utl95	minorpal	c_035		c_037		c_039		c_041		c_043	
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	6	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	NA	2.9	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	NA	30	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NC										
TTNUS288	PERCENT MOISTURE (%)	NA	NC										
TTNUS002	PH (S.U.)	NA	NC										
TTNUS002	TOTAL ORGANIC CARBON (mg/kg)	66500	NC										
TTNUS046	TOTAL SOLIDS (%)	NA	NC										

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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TABLE 9-5

SEDIMENT SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

nsample										X12SD001		X12SD001-AVG		X12SD001-D		X12SD002		
location										X12SD001		X12SD001		X12SD001		X12SD002		
project_no										00810_2010060		00810_2010060		00810_2010060		00810_2010060		
sample_coc										X12SD001		X12SD001-AVG		FD031810-03		X12SD002		
sample_date										20100318		20100318		20100318		20100318		
qc_type										NM		NM		FD		NM		
sacode										ORIG		AVG		DUP		NORMAL		
matrix										SD		SD		SD		SD		
duplicate														X12SD001				
top_depth										0.00		0.00		0.00		0.00		
bottom_dep										0.50		0.50		0.50		0.50		
depth_unit										FT		FT		FT		FT		
z	UTL95	MINORPAL	ORNL	ORNL_B	BTAG	TEC	NOAA	SUN	REFERENCE	001		002		004		007		
x										c_001	c_006	c_002	c_003	c_004	c_005	c_007	c_008	
Explosives (mg/kg)																		
1,3,5-TRINITROBENZENE	NA	8	2200	N	NA	NA	NA	8	Sunahara	0.2	U	0.2	U	0.2	U	0.2	U	
1,3-DINITROBENZENE	NA	6.1	6.1	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U	
2,4,6-TRINITROTOLUENE	NA	0.092	36	N[9]	0.092	NC	NC	NA	R3BTAG	0.25	U	0.25	U	0.25	U	0.25	U	
2,4-DINITROTOLUENE	NA	0.0416	16	C	0.042	NC	NC	NC	R3BTAG	0.2	U	0.2	U	0.2	U	0.2	U	
2,6-DINITROTOLUENE	NA	61	61	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U	
2-AMINO-4,6-DINITROTOLUENE	NA	150	150	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U	
2-NITROTOLUENE	NA	29	29	C	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U	
3,5-DINITROANILINE	NA	NA	NA		NA	NA	NA	NC	ORNL-R	0.25	U	0.25	U	0.25	U	0.25	U	
3-NITROTOLUENE	NA	6.1	6.1	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U	
4-AMINO-2,6-DINITROTOLUENE	NA	150	150	N	NA	NA	NA	NC	ORNL-R	0.2	U	0.2	U	0.2	U	0.2	U	
4-NITROTOLUENE	NA	4.06	300	C	4.06	NC	NC	NC	R3BTAG	0.2	U	0.2	U	0.2	U	0.2	U	
HMX	NA	126	3800	N	NA	NA	NA	126	Sunahara	0.2	UL	0.2	UL	0.2	UL	0.2	UL	
NITROBENZENE	NA	0.021	48	C	NA	NA	0.021[8]	NC	NOAA SQUIRT	0.2	U	0.2	U	0.2	U	0.2	U	
NITROGLYCERIN	NA	6.1	6.1	N	NA	NA	NA	NC	ORNL-R	1.2	U	1.2	U	1.2	U	1.2	U	
PETN	NA	NA	NA		NA	NA	NA	NC	ORNL-R	1.2	UJ	1.2	UJ	1.2	UJ	1.2	UJ	
RDX	NA	0.013	55	C	0.013	NC	NC	102	R3BTAG	0.2	U	0.2	U	0.2	U	0.2	U	
TETRYL	NA	0.1	240	N	NA	NA	NA	0.1	Sunahara	0.2	U	0.2	U	0.2	U	0.2	U	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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Notes:

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UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 9-6

SURFACE WATER SAMPLING RESULTS
TORPEDO BURIAL SITE (UXO-12)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

nsample	X12SW001		X12SW001-AVG		X12SW001-D	
location	X12SW001		X12SW001		X12SW001	
project_no	00810_2010060		00810_2010060		00810_2010060	
sample_coc	X12SW001		X12SW001-AVG		FD031810-04	
sample_date	20100318		20100318		20100318	
qc_type	NM		NM		FD	
sacode	ORIG		AVG		DUP	
matrix	SW		SW		SW	
duplicate					X12SW001	
depth_unit	NA		NA		NA	
z	001		002		004	
x	c_001	c_006	c_002	c_003	c_004	c_005
Explosives (ug/L)						
1,3,5-TRINITROBENZENE	0.2	UL	0.2	UL	0.2	U
1,3-DINITROBENZENE	0.2	U	0.2	U	0.2	U
2,4,6-TRINITROTOLUENE	**0.33**	**L**	**0.215**	**L**	0.2	U
2,4-DINITROTOLUENE	**0.033**	**J**	**0.033**	**J**	0.2	U
2,6-DINITROTOLUENE	0.2	U	0.2	U	0.2	U
2-AMINO-4,6-DINITROTOLUENE	0.2	U	0.2	U	0.2	U
2-NITROTOLUENE	0.2	U	0.2	U	0.2	U
3,5-DINITROANILINE	0.2	U	0.2	U	0.2	U
3-NITROTOLUENE	0.2	U	0.2	U	0.2	U
4-AMINO-2,6-DINITROTOLUENE	0.2	U	0.2	U	0.2	U
4-NITROTOLUENE	0.2	U	0.2	U	0.2	U
HMX	0.2	U	0.2	U	0.2	U
NITROBENZENE	0.2	U	0.2	U	0.2	U
NITROGLYCERIN	1.5	UJ	1.5	UJ	1.5	UJ
PETN	1.5	U	1.5	U	1.5	U
RDX	0.2	U	0.2	U	0.2	U
TETRYL	0.3	UL	0.295	UL	0.29	U

ug/L= microgram per liter
Bold means chemical was detected.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss00100		x21ss00101		x21ss00200		x21ss00202		x21ss00300		x21ss00302	
	nsample			X21SS0010006		X21SS0010024		X21SS0020006		X21SS0020024		X21SS0030006		X21SS0030024	
	location			X21SB001		X21SB001		X21SB002		X21SB002		X21SB003		X21SB003	
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc			X21SS0010006		X21SS0010024		X21SS0020006		X21SS0020024		X21SS0030006		X21SS0030024	
	gis_date			20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO	
	duplicate														
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00	
	depth_unit			FT		FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS		SS	
	z			001		003		005		007		009		011	
cas	x	utl95cv	minorpal	c_001		c_003		c_005		c_007		c_009		c_011	
	Explosives (mg/kg)														
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters														
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA												
TTNUS288	PERCENT MOISTURE (%)	NA	NA												
TTNUS002	PH (S.U.)	8.8	NA												
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA												
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA												

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss00400		x21ss00402		x21ss00500		x21ss00502		x21ss00600		x21ss00602
	nsample			X21SS0040006		X21SS0040024		X21SS0050006		X21SS0050024		X21SS0060006		X21SS0060024
	location			X21SB004		X21SB004		X21SB005		X21SB005		X21SB006		X21SB006
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051
	sample_coc			X21SS0040006		X21SS0040024		X21SS0050006		X21SS0050024		X21SS0060006		X21SS0060024
	gis_date			20100311		20100311		20100311		20100311		20100311		20100311
	qc_type			NM		NM		NM		NM		NM		NM
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL
	matrix			SO		SO		SO		SO		SO		SO
	duplicate													
	top_depth			0.00		0.00		0.00		0.00		0.00		
	bottom_dep			0.50		2.00		0.50		2.00		0.50		
	depth_unit			FT		FT		FT		FT		FT		FT
	submatrix			SS		SS		SS		SS		SS		SS
	z			013		015		017		019		021		023
cas	x	utl95cv	minorpal	c_013		c_015		c_017		c_019		c_021		c_023
	Explosives (mg/kg)													
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
121-82-4	RDX	NA	5.5	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2
	Miscellaneous Parameters													
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA											
TTNUS288	PERCENT MOISTURE (%)	NA	NA											
TTNUS002	PH (S.U.)	8.8	NA											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA											
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter				x21ss00700		x21ss00702		x21ss00800		x21ss00802		x21ss00900	
	nsample				X21SS0070006		X21SS0070024		X21SS0080006		X21SS0080024		X21SS0090006	
	location				X21SB007		X21SB007		X21SB008		X21SB008		X21SB009	
	project_no				00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051	
	sample_coc				X21SS0070006		X21SS0070024		X21SS0080006		X21SS0080024		X21SS0090006	
	gis_date				20100311		20100311		20100311		20100311		20100311	
	qc_type				NM		NM		NM		NM		NM	
	sacode				NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix				SO		SO		SO		SO		SO	
	duplicate													
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00
	bottom_dep			2.00		0.50		2.00		0.50		2.00		0.50
	depth_unit				FT		FT		FT		FT		FT	
	submatrix				SS		SS		SS		SS		SS	
	z				025		027		029		031		033	
cas	x	utl95cv	minorpal		c_025		c_027		c_029		c_031		c_033	
	Explosives (mg/kg)													
99-35-4	1,3,5-TRINITROBENZENE	NA	9	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	U	0.25	U	0.25	U	0.25	U	0.24	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
2691-41-0	HMX	NA	380	UL	0.2	UL	0.2	UL	0.2	UL	0.19	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U
78-11-5	PETN	NA	NA	U	1.2	U	1.2	U	1.2	U	1.1	U	1.2	U
121-82-4	RDX	NA	5.5	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
479-45-8	TETRYL	NA	24	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U
	Miscellaneous Parameters													
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA				42.7							
TTNUS288	PERCENT MOISTURE (%)	NA	NA				17.7							
TTNUS002	PH (S.U.)	8.8	NA				4.73							
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA				2470							
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA				**82.3**							

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss00902		x21ss01000		x21ss01002		x21ss01100		x21ss01102		x21ss01200
	nsample			X21SS0090024		X21SS0100006		X21SS0100024		X21SS0110006		X21SS0110024		X21SS0120006
	location			X21SB009		X21SB010		X21SB010		X21SB011		X21SB011		X21SB012
	project_no			00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051
	sample_coc			X21SS0090024		X21SS0100006		X21SS0100024		X21SS0110006		X21SS0110024		X21SS0120006
	gis_date			20100311		20100311		20100311		20100311		20100311		20100311
	qc_type			NM		NM		NM		NM		NM		NM
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL
	matrix			SO		SO		SO		SO		SO		SO
	duplicate													
	top_depth			0.00		0.00		0.00		0.00		0.00		
	bottom_dep			2.00		0.50		2.00		0.50		2.00		
	depth_unit			FT		FT		FT		FT		FT		FT
	submatrix			SS		SS		SS		SS		SS		SS
	z			035		037		039		041		043		045
cas	x	utl95cv	minorpal	c_035		c_037		c_039		c_041		c_043		c_045
	Explosives (mg/kg)													
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.24	U	0.25	U	0.24	U	0.25	U	0.24	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
88-72-2	2-NITROTOLUENE	0.15	2.9	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
618-87-1	3,5-DINITROANILINE	NA	NA	0.24	U	0.25	U	0.24	U	0.25	U	0.24	U	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
99-99-0	4-NITROTOLUENE	0.21	30	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
2691-41-0	HMX	NA	380	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2
98-95-3	NITROBENZENE	NA	0.023	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
55-63-0	NITROGLYCERIN	NA	0.61	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
78-11-5	PETN	NA	NA	1.1	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
121-82-4	RDX	NA	5.5	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
479-45-8	TETRYL	NA	24	0.19	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2
	Miscellaneous Parameters													
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA	62.3		74								
TTNUS288	PERCENT MOISTURE (%)	NA	NA	18.5		22.8								
TTNUS002	PH (S.U.)	8.8	NA	4.91		5.16								
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA	4860		9460	J							
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA	**81.5**		77.2								

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter				x21ss01202		x21ss01300		x21ss01302		x21ss01400		x21ss01402
	nsample				X21SS0120024		X21SS0130006		X21SS0130024		X21SS0140006		X21SS0140006-AVG
	location				X21SB012		X21SB013		X21SB013		X21SB014		X21SB014
	project_no				00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051
	sample_coc				X21SS0120024		X21SS0130006		X21SS0130024		X21SS0140006		X21SS0140006-AVG
	gis_date				20100311		20100311		20100311		20100311		20100311
	qc_type				NM		NM		NM		NM		NM
	sacode				NORMAL		NORMAL		NORMAL		DUP		AVG
	matrix				SO		SO		SO		SO		SO
	duplicate												
	top_depth			0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		2.00		0.50		2.00		0.50	
	depth_unit				FT		FT		FT		FT		FT
	submatrix				SS		SS		SS		SS		SS
	z				047		049		051		053		054
cas	x	utl95cv	minorpal		c_047		c_049		c_051		c_053		c_054
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
99-65-0	1,3-DINITROBENZENE	NA	0.61	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25
121-14-2	2,4-DINITROTOLUENE	NA	0.57	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
606-20-2	2,6-DINITROTOLUENE	NA	0.25	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
88-72-2	2-NITROTOLUENE	0.15	2.9	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
618-87-1	3,5-DINITROANILINE	NA	NA	U	0.25	U	0.25	U	0.24	U	0.25	U	0.25
99-08-1	3-NITROTOLUENE	NA	0.61	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
99-99-0	4-NITROTOLUENE	0.21	30	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
2691-41-0	HMX	NA	380	UL	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.20
98-95-3	NITROBENZENE	NA	0.023	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
55-63-0	NITROGLYCERIN	NA	0.61	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
78-11-5	PETN	NA	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
121-82-4	RDX	NA	5.5	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
479-45-8	TETRYL	NA	24	U	0.2	U	0.2	U	0.19	U	0.2	U	0.20
	Miscellaneous Parameters												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA										
TTNUS288	PERCENT MOISTURE (%)	NA	NA										
TTNUS002	PH (S.U.)	8.8	NA										
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA										
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA										

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

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TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter				x21ss01404		x21ss01406		x21ss01500		x21ss01502		x21ss01600
	nsample				X21SS0140006-D		X21SS0140024		X21SS0150006		X21SS0150024		X21SS0160006
	location				X21SB014		X21SB014		X21SB015		X21SB015		X21SB016
	project_no				00810_2010051		00810_2010051		00810_2010051		00810_2010051		00810_2010051
	sample_coc				FD031110-02		X21SS0140024		X21SS0150006		X21SS0150024		X21SS0160006
	gis_date				20100311		20100311		20100311		20100311		20100311
	qc_type				FD		NM		NM		NM		NM
	sacode				DUP		NORMAL		NORMAL		NORMAL		NORMAL
	matrix				SO		SO		SO		SO		SO
	duplicate				X21SS0140006								
	top_depth			0.00		0.00		0.00		0.00		0.00	
	bottom_dep			0.50		0.50		2.00		0.50		2.00	
	depth_unit				FT		FT		FT		FT		FT
	submatrix				SS		SS		SS		SS		SS
	z				056		059		061		063		065
cas	x	utl95cv	minorpal		c_056		c_059		c_061		c_063		c_065
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
99-65-0	1,3-DINITROBENZENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24
121-14-2	2,4-DINITROTOLUENE	NA	0.57	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
606-20-2	2,6-DINITROTOLUENE	NA	0.25	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
88-72-2	2-NITROTOLUENE	0.15	2.9	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
618-87-1	3,5-DINITROANILINE	NA	NA	U	0.25	U	0.25	U	0.25	U	0.24	U	0.24
99-08-1	3-NITROTOLUENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
99-99-0	4-NITROTOLUENE	0.21	30	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
2691-41-0	HMX	NA	380	UL	0.2	UL	0.2	UL	0.2	UL	0.19	UL	0.19
98-95-3	NITROBENZENE	NA	0.023	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
55-63-0	NITROGLYCERIN	NA	0.61	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
78-11-5	PETN	NA	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2
121-82-4	RDX	NA	5.5	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
479-45-8	TETRYL	NA	24	U	0.2	U	0.2	U	0.2	U	0.19	U	0.19
	Miscellaneous Parameters												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA										
TTNUS288	PERCENT MOISTURE (%)	NA	NA										
TTNUS002	PH (S.U.)	8.8	NA										
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA										
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA										

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
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TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter				x21ss01602		x21ss01700		x21ss01702		x21ss01800		x21ss01802	
	nsample				X21SS0160024		X21SS0170006		X21SS0170024		X21SS0180006		X21SS0180024	
	location				X21SB016		X21SB017		X21SB017		X21SB018		X21SB018	
	project_no				00810_2010051		00810_2010060		00810_2010060		00810_2010060		00810_2010060	
	sample_coc				X21SS0160024		X21SS0170006		X21SS0170024		X21SS0180006		X21SS0180024	
	gis_date				20100311		20100312		20100312		20100312		20100312	
	qc_type				NM		NM		NM		NM		NM	
	sacode				NORMAL		NORMAL		NORMAL		NORMAL		DUP	
	matrix				SO		SO		SO		SO		SO	
	duplicate													
	top_depth			0.00		0.00		0.00		0.00		0.00		0.00
	bottom_dep			0.50		2.00		0.50		2.00		0.50		2.00
	depth_unit				FT		FT		FT		FT		FT	
	submatrix				SS		SS		SS		SS		SS	
	z				067		069		071		073		075	
cas	x	utl95cv	minorpal		c_067		c_069		c_071		c_073		c_075	
	Explosives (mg/kg)													
99-35-4	1,3,5-TRINITROBENZENE	NA	9	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	U	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters													
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA											
TTNUS288	PERCENT MOISTURE (%)	NA	NA											
TTNUS002	PH (S.U.)	8.8	NA											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA											
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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Notes:
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TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss01804		x21ss01806		x21ss01900		x21ss01902		x21ss02000	
	nsample			X21SS0180024-AVG		X21SS0180024-D		X21SS0190006		X21SS0190024		X21SS0200006	
	location			X21SB018		X21SB018		X21SB019		X21SB019		X21SB020	
	project_no			00810_2010060		00810_2010060		00810_2010060		00810_2010060		00810_2010060	
	sample_coc			X21SS0180024-AVG		FD031210-01		X21SS0190006		X21SS0190024		X21SS0200006	
	gis_date			20100312		20100312		20100312		20100312		20100312	
	qc_type			NM		FD		NM		NM		NM	
	sacode			AVG		DUP		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO	
	duplicate					X21SS0180024							
	top_depth			0.00		0.00		0.00		0.00		0.00	
	bottom_dep			2.00		2.00		0.50		2.00		0.50	
	depth_unit			FT		FT		FT		FT		FT	
	submatrix			SS		SS		SS		SS		SS	
	z			076		078		081		083		085	
cas	x	utl95cv	minorpal	c_076		c_078		c_081		c_083		c_085	
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.20	UL	0.2	UL	0.2	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U	1.2	U	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.20	U	0.2	U	0.2	U	0.2	U	0.2	U
	Miscellaneous Parameters												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA										
TTNUS288	PERCENT MOISTURE (%)	NA	NA										
TTNUS002	PH (S.U.)	8.8	NA										
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA										
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA										

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
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Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 10-4

SURFACE SOIL SAMPLING RESULTS
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			x21ss02002		x21ss02100	
	nsample			X21SS0200024		X21SS0210006	
	location			X21SB020		X21SB021	
	project_no			00810_2010060		00810_2010060	
	sample_coc			X21SS0200024		X21SS0210006	
	gis_date			20100312		20100312	
	qc_type			NM		NM	
	sacode			NORMAL		NORMAL	
	matrix			SO		SO	
	duplicate						
	top_depth			0.00		0.00	
	bottom_dep			2.00		0.50	
	depth_unit			FT		FT	
	submatrix			SS		SS	
	z			087		089	
cas	x	utl95cv	minorpal	c_087		c_089	
	Explosives (mg/kg)						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	U	0.2	U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2	U	0.2	U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	U	0.25	U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	U	0.2	U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	U	0.2	U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2	U	0.2	U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	U	0.25	U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	U	0.2	U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	U	0.2	U
99-99-0	4-NITROTOLUENE	0.21	30	0.2	U	0.2	U
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	U	0.2	U
55-63-0	NITROGLYCERIN	NA	0.61	1.2	U	1.2	U
78-11-5	PETN	NA	NA	1.2	U	1.2	U
121-82-4	RDX	NA	5.5	0.2	U	0.2	U
479-45-8	TETRYL	NA	24	0.2	U	0.2	U
	Miscellaneous Parameters						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)	NA	NA				
TTNUS288	PERCENT MOISTURE (%)	NA	NA				
TTNUS002	PH (S.U.)	8.8	NA				
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200	NA				
TTNUS046	**TOTAL SOLIDS (%)**	79.2	NA				

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory

UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.

J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.

L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.

TABLE 11-3

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO CASING DISPOSAL AREA (UXO-23)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter														column2		column4		column6		column8		column10		column12		column14	
	nsample														X23SB0010204		X23SB0010406		X23SB0020204		X23SB0020406		X23SB0030204		X23SB0030406		X23SB0040204	
	location														X23SB001		X23SB001		X23SB002		X23SB002		X23SB003		X23SB003		X23SB004	
	sample_coc														X23SB0010204		X23SB0010406		X23SB0020204		X23SB0020406		X23SB0030204		X23SB0030406		X23SB0040204	
	sample_date														20100311		20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type														NM		NM		NM		NM		NM		NM		NM	
	sacode														NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix														SO		SO		SO		SO		SO		SO		SO	
	duplicate																											
	top_depth															2.00		4.00		2.00		4.00		2.00		4.00		2.00
	bottom_dep															4.00		6.00		4.00		6.00		4.00		6.00		4.00
	submatrix														SB		SB		SB		SB		SB		SB		SB	
	depth_stat														NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	z														001		003		005		007		009		011		013	
cas	x	utl95	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sun	suninv	lanlplant	reference	c_001		c_003		c_005		c_007		c_009		c_011		c_013	
	Explosives (mg/kg)																											
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	Sunahara Plant	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	3.6	NA	NA	NA	NA	NA	NA	6	12	NC	ORNL-R	0.25	UL	0.24	UL	0.25	UL	0.24	UL	0.25	UL	0.24	UL	0.25	UL
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	MDE Cleanup Standard S-GW	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.10	7.8	0.25	NA	NA	NA	NA	5	7	NC	MDE Cleanup Standard S-GW	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	ORNL-R	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
88-72-2	2-NITROTOLUENE	NA	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	0.25	UL	0.24	UL	0.25	UL	0.24	UL	0.25	UL	0.24	UL	0.25	UL
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
99-99-0	4-NITROTOLUENE	NA	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	ORNL-R	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	MDE Cleanup Standard S-GW	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	ORNL-R	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NA	NC	25	ORNL-R	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL	0.19	UL	0.2	UL
	Inorganics (mg/kg)																											
7429-90-5	**ALUMINUM**	35400	7700	7700	7800	NA	NA	NC	NC	NC	NC	NC	NC	ORNL-R	15100 [PAL] [ORNL] [MDRES]	J	26400 [PAL] [ORNL] [MDRES]	J	19400 [PAL] [ORNL] [MDRES]	J	32300 [PAL] [ORNL] [MDRES]	J	27200 [PAL] [ORNL] [MDRES]	J	24300 [PAL] [ORNL] [MDRES]	J	24500 [PAL] [ORNL] [MDRES]	J
7440-36-0	ANTIMONY	1.8	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.033	UL	0.033	UL	0.033	UL	0.032	UL	0.04	J	0.032	UL	0.033	UL
7440-38-2	ARSENIC	18.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard S-GW	5 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.64 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.85 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.87 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.1 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	134	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	59.3		93.1		49.5		56.7		44		48.6		54.8	
7440-41-7	BERYLLIUM	3.3	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	0.98	U	0.59		0.35	J	0.29	J	0.27	J	0.24	J	0.36	J
7440-43-9	CADMIUM	0.61	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.49	U	0.082	U	0.061	U	0.082	U	0.081	U	0.082	U	0.08	U
7440-70-2	CALCIUM	2590	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	34.5		45.3		23.2		11.5		28.6		14.4		26.3	
7440-47-3	CHROMIUM	60.1	26	12000	12000	2000000000	26	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	37.8 [PAL] [SSL]		31.3 [PAL] [SSL]		25.8		26.4 [PAL] [SSL]		19.8		22.9		21.6	
7440-48-4	COBALT	133	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	ORNL-R	2.7 [PAL] [ORNL]	J	3.6 [PAL] [ORNL]		2		1.7		2.5 [PAL] [ORNL]		1.9		2.5 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	13.3	K	9.1		12.4		10.4		4.6		3.9	K	5.3	
7439-89-6	**IRON**	83100	5500	5500	5500	NA	NA	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	89500 [BKG] [PAL] [ORNL] [MDRES]		14500 [PAL] [ORNL] [MDRES]		19500 [PAL] [ORNL] [MDRES]		10200 [PAL] [ORNL] [MDRES]		9620 [PAL] [ORNL] [MDRES]		13600 [PAL] [ORNL] [MDRES]		12500 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	19.2 [PAL] [SSL]		13 [PAL] [SSL]		13.4 [PAL] [SSL]		13.4 [PAL] [SSL]		12.5 [PAL] [SSL]		12.1 [PAL] [SSL]		10.3	
7439-93-2	**LITHIUM**	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	ORNL Plant	15.3 [PAL] [OPLNT]		**21.5 [PAL] [ORNL] [OPLNT]**		**16.3 [PAL] [ORNL] [OPLNT]**		**24.2 [PAL] [ORNL] [OPLNT]**		**19 [PAL] [ORNL] [OPLNT]**		**21.9 [PAL] [ORNL] [OPLNT]**		**17.8 [PAL] [ORNL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	R3BTAG	1310	K	2030	K	997	K	1140	K	948	K	1110	K	1270	K
7439-96-5	MANGANESE	4130	160	180	160	950	220	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	44.5		33.8		27.8		17.4		30.3		16		29.2	
7439-97-6	MERCURY	0.18	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	R3BTAG	0.019	J	0.023	J	0.014	UL	0.013	UL	0.045	J	0.058	J	0.02	J
7440-02-0	NICKEL	18.2	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	11.8		11.9		7.8		6.6		5.9		6.6		7.1	
7440-09-7	POTASSIUM	2610	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	1690	K	1950	K	1670	K	1960	K	806	K	996	K	1250	K
7782-49-2	SELENIUM	13.3	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.25	K	0.033	U	0.067	J	0.032	UL	0.033	UL	0.032	UL	0.033	UL
7440-22-4	SILVER	11.4	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	0.49	UL	0.082	UL	0.081	UL	0.082	UL	0.081	UL	0.082	UL	0.08	UL
7440-23-5	SODIUM	258	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC		52.1	J	127		64.5		82.7		46.2		54.5		106	
7440-24-6	STRONTIUM	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	R3BTAG	5.3	J	7.5		6.6		6.9		4.4		4.9		5.9	
7440-31-5	**TIN**	NA	0.89	4700	4700	NA	NA	0.89	NC	NC	NC	NC	NC	R3BTAG	4.9	U	**1.1 [PAL] [BTAG]**	J	0.82	U	**0.98 [PAL] [BTAG]**	J	0.82	J	**0.96 [PAL] [BTAG]**	J	0.81	U
7440-62-2	VANADIUM	194	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	MDE Cleanup Standard-R	50.5 [PAL] [ORNL] [MDRES] [SSL]	K	50.2 [PAL] [ORNL] [MDRES] [SSL]	K	40.2 [PAL] [ORNL] [MDRES] [SSL]	K	42.7 [PAL] [ORNL] [MDRES] [SSL]	K	32.9 [PAL] [MDRES] [SSL]	K	37.4 [PAL] [MDRES] [SSL]	K	35.4 [PAL] [MDRES] [SSL]	K
7440-66-6	ZINC	70.40	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	U.S. EPA Eco-SSL	32.8		25.5		20.3		18.7		19.3		20.3		20.5	
	Miscellaneous Paramters																											
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								42.6						42.9	
TTNUS288	PERCENT MOISTURE (%)		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								17						15	
TTNUS002	PH (S.U.) S.U.		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								4.64						5.3	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66550	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								48	J					116	
TTNUS046	TOTAL SOLIDS (%)		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC								83						85	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The **laboratory reported concentration is an estimate of the true** concentration and biased high.

TABLE 11-3

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO CASING DISPOSAL AREA (UXO-23)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column16		column18		column20		column22		column23		column25		column28	
	nsample			X23SB0040406		X23SB0050204		X23SB0050406		X23SB0060204		X23SB0060204-AVG		X23SB0060204-D		X23SB0060406	
	location			X23SB004		X23SB005		X23SB005		X23SB006		X23SB006		X23SB006		X23SB006	
	sample_coc			X23SB0040406		X23SB0050204		X23SB0050406		X23SB0060204		X23SB0060204-AVG		FD031110-01		X23SB0060406	
	sample_date			20100311		20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		NM		NM		FD		NM	
	sacode			NORMAL		NORMAL		NORMAL		ORIG		AVG		DUP		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO	
	duplicate													X23SB0060204			
	top_depth			4.00		2.00		4.00		2.00		2.00		2.00		4.00	
	bottom_dep			6.00		4.00		6.00		4.00		4.00		4.00		6.00	
	submatrix			SB		SB		SB		SB		SB		SB		SB	
	depth_stat			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	z			015		017		019		021		022		024		027	
cas	x	utl95	minorpal	c_015		c_017		c_019		c_021		c_022		c_024		c_027	
	Explosives (mg/kg)																
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25	UL	0.24	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	UL	0.24	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL	0.25	UL
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
99-99-0	4-NITROTOLUENE	NA	30	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
55-63-0	NITROGLYCERIN	NA	0.61	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL
78-11-5	PETN	NA	NA	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL	1.2	UL
121-82-4	RDX	NA	5.5	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
479-45-8	TETRYL	NA	24	0.2	UL	0.2	UL	0.2	UL	0.2	UL	0.20	UL	0.2	UL	0.2	UL
	Inorganics (mg/kg)																
7429-90-5	**ALUMINUM**	35400	7700	30600 [PAL] [ORNL] [MDRES]	J	25400 [PAL] [ORNL] [MDRES]	J	26200 [PAL] [ORNL] [MDRES]	J	13400 [PAL] [ORNL] [MDRES]	J	13700 [PAL] [ORNL] [MDRES]	J	14000 [PAL] [ORNL] [MDRES]	J	20600 [PAL] [ORNL] [MDRES]	J
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.04	J	0.033	UL	0.033	UL	0.0325	UL	0.032	UL	0.032	UL
7440-38-2	ARSENIC	18.9	0.026	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.94 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.53 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.965 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	0.83 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	134	330	91.1		49.9		43.4		29.2		37.5		45.8		40.1	
7440-41-7	BERYLLIUM	3.3	16	0.5		0.37	J	0.23	J	0.17	U	0.1975	J	0.31	J	0.22	J
7440-43-9	CADMIUM	0.61	0.36	0.083	U	0.17	U	0.082	U	0.083	U	0.083	U	0.083	U	0.081	U
7440-70-2	CALCIUM	2590	NA	19.7		24.7		16.7		12.1		15.85		19.6		15.1	
7440-47-3	CHROMIUM	60.1	26	38.2 [PAL] [SSL]		23.5		21.1		14.1		17.2		20.3		16.7	
7440-48-4	COBALT	133	2.3	2.9 [PAL] [ORNL]		1.9		1.8		1.1		1.35		1.6		1.4	
7440-50-8	COPPER	48.6	28	10.1		6.2	K	4.9		3.8		4.25		4.7		4.3	
7439-89-6	**IRON**	83100	5500	17800 [PAL] [ORNL] [MDRES]		21600 [PAL] [ORNL] [MDRES]		10600 [PAL] [ORNL] [MDRES]		5380		9490 [PAL] [ORNL] [MDRES]		13600 [PAL] [ORNL] [MDRES]		9240 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	14.3 [PAL] [SSL]		11.7 [PAL] [SSL]		11.2 [PAL] [SSL]		8.4		8.5		8.6		9	
7439-93-2	**LITHIUM**	NA	2	**29.6 [PAL] [ORNL] [OPLNT]**		**17 [PAL] [ORNL] [OPLNT]**		**19.6 [PAL] [ORNL] [OPLNT]**		**11.8 [PAL] [OPLNT]**		**12.5 [PAL] [OPLNT]**		**13.4 [PAL] [OPLNT]**		**13.2 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	1900	K	1040	K	1100	K	621	K	765.5	K	910	K	807	K
7439-96-5	MANGANESE	4130	160	28.7		29.4		17.2		14.8		17.95		21.1		16.9	
7439-97-6	MERCURY	0.18	0.058	0.03	J	0.052	J	0.055	J	0.021	J	0.023	J	0.025	J	0.022	J
7440-02-0	NICKEL	18.2	38	11.3		7.8		7.5		4		5.4		6.8		5.6	
7440-09-7	POTASSIUM	2610	NA	3130 [BKG]	K	871	K	999	K	560	K	800	K	1040	K	796	K
7782-49-2	SELENIUM	13.3	0.52	0.033	UL	0.033	U	0.033	UL	0.033	UL	0.0325	UL	0.032	U	0.032	UL
7440-22-4	SILVER	11.4	4.2	0.083	UL	0.17	UL	0.082	UL	0.083	UL	0.083	UL	0.083	UL	0.081	UL
7440-23-5	SODIUM	258	NA	167		99.5		73		27.8		36.1		44.4		37.2	
7440-24-6	STRONTIUM	NA	120	10.6		3.5	K	4.4		2.7		3.75		4.8		4.3	
7440-31-5	TIN	NA	0.89	1.5 [PAL] [BTAG]	J	1.7	U	0.87	J	0.83	U	0.83	U	0.83	U	0.82	U
7440-62-2	VANADIUM	194	7.8	62.6 [PAL] [ORNL] [MDRES] [SSL]	K	42.2 [PAL] [ORNL] [MDRES] [SSL]	K	33.3 [PAL] [MDRES] [SSL]	K	23.5 [PAL] [MDRES] [SSL]	K	29.95 [PAL] [MDRES] [SSL]	K	36.4 [PAL] [MDRES] [SSL]	K	26.8 [PAL] [MDRES] [SSL]	K
7440-66-6	ZINC	70.40	46	27.5		25		21.9		12.6		15		17.4		15.9	
	Miscellaneous Paramters																
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)		NC	42.2													
TTNUS288	PERCENT MOISTURE (%)		NC	23.3													
TTNUS002	PH (S.U.) S.U.		NC	5.14													
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66550	NC	535													
TTNUS046	TOTAL SOLIDS (%)		NC	76.7													

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 11-3

SUBSURFACE SOIL SAMPLING RESULTS
TORPEDO CASING DISPOSAL AREA (UXO-23)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	parameter			column30		column32		column34		column36		column38		column40		column42		column44	
	nsample			X23SB0070204		X23SB0070406		X23SB0080204		X23SB0080406		X23SB0090204		X23SB0090406		X23SB0100204		X23SB0100406	
	location			X23SB007		X23SB007		X23SB008		X23SB008		X23SB009		X23SB009		X23SB010		X23SB010	
	sample_coc			X23SB0070204		X23SB0070406		X23SB0080204		X23SB0080406		X23SB0090204		X23SB0090406		X23SB0100204		X23SB0100406	
	sample_date			20100311		20100311		20100311		20100311		20100311		20100311		20100311		20100311	
	qc_type			NM		NM		NM		NM		NM		NM		NM		NM	
	sacode			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	matrix			SO		SO		SO		SO		SO		SO		SO		SO	
	duplicate																		
	top_depth			2.00		4.00		2.00		4.00		2.00		4.00		2.00		4.00	
	bottom_dep			4.00		6.00		4.00		6.00		4.00		6.00		4.00		6.00	
	submatrix			SB		SB		SB		SB		SB		SB		SB		SB	
	depth_stat			NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
	z			029		031		033		035		037		039		041		043	
cas	x	utl95	minorpal	c_029		c_031		c_033		c_035		c_037		c_039		c_041		c_043	
	Explosives (mg/kg)																		
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
99-65-0	1,3-DINITROBENZENE	0.75	0.61	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
118-96-7	2,4,6-TRINITROTOLUENE	NA	**3.6**	0.25	UL	0.24	UL	0.24	UL	0.25	UL	0.25	U	0.25	UL	0.24	UL	0.25	UL
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
88-72-2	2-NITROTOLUENE	NA	2.9	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
618-87-1	3,5-DINITROANILINE	NA	NA	0.25	UL	0.24	UL	0.24	UL	0.25	UL	0.25	U	0.25	UL	0.24	UL	0.25	UL
99-08-1	3-NITROTOLUENE	NA	0.61	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
99-99-0	4-NITROTOLUENE	NA	30	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
2691-41-0	HMX	NA	380	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	UL	0.2	UL	0.19	UL	0.2	UL
98-95-3	NITROBENZENE	NA	0.023	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
55-63-0	NITROGLYCERIN	NA	0.61	1.2	UL	1.2	UL	1.1	UL	1.2	UL	1.2	U	1.2	UL	1.2	UL	1.2	UL
78-11-5	PETN	NA	NA	1.2	UL	1.2	UL	1.1	UL	1.2	UL	1.2	U	1.2	UL	1.2	UL	1.2	UL
121-82-4	RDX	NA	5.5	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
479-45-8	TETRYL	NA	24	0.2	UL	0.2	UL	0.19	UL	0.2	UL	0.2	U	0.2	UL	0.19	UL	0.2	UL
	Inorganics (mg/kg)																		
7429-90-5	**ALUMINUM**	35400	7700	14800 [PAL] [ORNL] [MDRES]	J	16600 [PAL] [ORNL] [MDRES]	J	17700 [PAL] [ORNL] [MDRES]	J	18100 [PAL] [ORNL] [MDRES]	J	**35500 [BKG] [PAL] [ORNL] [MDRES]**	J	16500 [PAL] [ORNL] [MDRES]	J	20600 [PAL] [ORNL] [MDRES]	J	19200 [PAL] [ORNL] [MDRES]	J
7440-36-0	ANTIMONY	1.8	0.27	0.033	UL	0.033	UL	0.034	J	0.032	UL	0.044	J	0.042	J	0.035	J	0.043	J
7440-38-2	ARSENIC	18.9	0.026	1.8 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.1 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.1 [PAL] [ORNL] [MDRES] [MDSGW]	J	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	J	3.8 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.2 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.7 [PAL] [ORNL] [MDRES] [MDSGW]	J	2.9 [PAL] [ORNL] [MDRES] [MDSGW]	J
7440-39-3	BARIUM	134	330	31.8		24.2		66.2		27.4		92.8		47.6		44		43.5	
7440-41-7	BERYLLIUM	3.3	16	0.23	J	0.16	U	0.61		0.49	U	1		0.39	J	0.4	J	0.38	J
7440-43-9	CADMIUM	0.61	0.36	0.081	U	0.081	U	0.082	U	0.082	U	0.17	U	0.082	U	0.083	U	0.082	U
7440-70-2	CALCIUM	2590	NA	20.6		12.3		128		13.3		129		47.8		72.4		58.3	
7440-47-3	CHROMIUM	60.1	**26**	13.8		11.2		20.3		16.5		35.3 [PAL] [SSL]		20.5		20.6		22.9	
7440-48-4	COBALT	133	2.3	1.1		0.8		8.5 [PAL] [ORNL]		1.1		7.6 [PAL] [ORNL]		2.5 [PAL] [ORNL]		3.6 [PAL] [ORNL]		3.2 [PAL] [ORNL]	
7440-50-8	COPPER	48.6	28	3.7	K	2.4	K	5.8		4.7		15.4		7		7		7.5	
7439-89-6	**IRON**	83100	5500	11900 [PAL] [ORNL] [MDRES]		8160 [PAL] [ORNL] [MDRES]		16300 [PAL] [ORNL] [MDRES]		10700 [PAL] [ORNL] [MDRES]		33400 [PAL] [ORNL] [MDRES]		15700 [PAL] [ORNL] [MDRES]		19700 [PAL] [ORNL] [MDRES]		20300 [PAL] [ORNL] [MDRES]	
7439-92-1	LEAD	40.5	11	7.4		7.3		12.8 [PAL] [SSL]		8.4		14.3 [PAL] [SSL]		8.7		10		9.6	
7439-93-2	**LITHIUM**	NA	2	**9.7 [PAL] [OPLNT]**		**8.7 [PAL] [OPLNT]**		**15 [PAL] [OPLNT]**		**12.5 [PAL] [OPLNT]**		**24.4 [PAL] [ORNL] [OPLNT]**		**12.4 [PAL] [OPLNT]**		**13.9 [PAL] [OPLNT]**		**13.9 [PAL] [OPLNT]**	
7439-95-4	MAGNESIUM	2640	4400	635	K	529	K	1160	K	649	K	2940 [BKG]	K	1240	K	1060	K	995	K
7439-96-5	MANGANESE	4130	160	18.4		12.5		172 [PAL] [MDRES]		12.4		147		44.1		80.2		76	
7439-97-6	MERCURY	0.18	0.058	0.037	J	0.057	J	0.053	J	0.056	J	0.035	J	0.016	J	0.039	J	0.071 [PAL] [BTAG]	J
7440-02-0	NICKEL	18.2	38	4.5		3.4		10.5		4.9		18.1		8.4		8		7.8	
7440-09-7	POTASSIUM	2610	NA	449	K	418	K	930	K	699	K	2030	K	953	K	782	K	894	K
7782-49-2	SELENIUM	13.3	0.52	0.033	UL	0.033	UL	0.059	J	0.032	UL	0.065	UL	0.033	UL	0.032	UL	0.032	UL
7440-22-4	SILVER	11.4	4.2	0.081	UL	0.081	UL	0.082	UL	0.082	UL	0.17	UL	0.082	UL	0.083	UL	0.082	UL
7440-23-5	SODIUM	258	NA	48.9		37.8		52.7		31.8		136		68.6		42		82.8	
7440-24-6	STRONTIUM	NA	120	1.9	K	1.9		4.3		2.6		7.6		4		3.2	K	3.3	K
7440-31-5	TIN	NA	0.89	0.81	U	0.81	U	0.83	U	0.82	U	1.7	U	0.82	U	0.83	U	0.82	U
7440-62-2	VANADIUM	194	7.8	25.1 [PAL] [MDRES] [SSL]	K	20.1 [PAL] [MDRES] [SSL]	K	33.9 [PAL] [MDRES] [SSL]	K	29.3 [PAL] [MDRES] [SSL]	K	57.6 [PAL] [ORNL] [MDRES] [SSL]	K	31.4 [PAL] [MDRES] [SSL]	K	34 [PAL] [MDRES] [SSL]	K	37 [PAL] [MDRES] [SSL]	K
7440-66-6	ZINC	70.40	46	16		13.3		39.2		16.8		50.4 [PAL] [SSL]		22.1		26.7		39.3	
	Miscellaneous Paramters																		
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/kg)		NC																
TTNUS288	PERCENT MOISTURE (%)		NC																
TTNUS002	PH (S.U.) S.U.		NC																
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	66550	NC																
TTNUS046	TOTAL SOLIDS (%)		NC																

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate or imprecise.
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The **laboratory reported concentration is an estimate of the true** concentration and biased high.

TABLE 13-4

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

														a01	a02	a03	a04	a05	a06	a07	a08
														001	002	003	004	005	006	007	008
														X28SS0010006	X28SS0010024	X28SS0020006	X28SS0020024	X28SS0030006	X28SS0030024	X28SS0040006	X28SS0040024
														X28SB001	X28SB001	X28SB002	X28SB002	X28SB003	X28SB003	X28SB004	X28SB004
														00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
														X28SS0010006	X28SS0010024	X28SS0020006	X28SS0020024	X28SS0030006	X28SS0030024	X28SS0040006	X28SS0040024
														20100120	20100121	20100120	20100120	20100120	20100120	20100121	20100121
														20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121
														NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
	matrix													SO	SO	SO	SO	SO	SO	SO	SO
	duplicate																				
	top_depth													0	0	0	0	0	0	0	0
	bottom_dep													0.5	2	0.5	2	0.5	2	0.5	2
	submatrix													SS	SS	SS	SS	SS	SS	SS	SS
cas	sort	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	laniplant	c_001	c_002	c_003	c_004	c_005	c_006	c_007	c_008
	Explosives (mg/kg)																				
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	3.6	NA	NA	NA	NA	NA	NA	6	12	NC	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	2.5 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NC	12 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	12 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	2 UR	0.2 UR	0.2 UR	0.2 UR	0.2 UR	0.2 UR	0.2 U	0.2 U
	Inorganics (mg/kg)																				
7429-90-5	ALUMINUM	19700	7700	7700	7800	NA	10	NC	NC	NC	NC	NC	NC	8760 L [PAL] [ORNL] [MDRES] [SSL]	9500 L [PAL] [ORNL] [MDRES] [SSL]	11100 L [PAL] [ORNL] [MDRES] [SSL]	7580 L [SSL]	13500 L [PAL] [ORNL] [MDRES] [SSL]	14000 L [PAL] [ORNL] [MDRES] [SSL]	9000 [PAL] [ORNL] [MDRES] [SSL]	13000 [PAL] [ORNL] [MDRES] [SSL]
7440-36-0	ANTIMONY	NA	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	0.066 UL	0.036 J	0.063 J	0.032 UL	0.1 J	0.063 UL	0.14 L	0.065 UL
7440-38-2	ARSENIC	14.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	3.3 L [PAL] [ORNL] [MDRES] [MDSGW]	2.2 L [PAL] [ORNL] [MDRES] [MDSGW]	2.1 L [PAL] [ORNL] [MDRES] [MDSGW]	1.2 L [PAL] [ORNL] [MDRES] [MDSGW]	2.6 L [PAL] [ORNL] [MDRES] [MDSGW]	2.0 L [PAL] [ORNL] [MDRES] [MDSGW]	1.9 [PAL] [ORNL] [MDRES] [MDSGW]	2.0 [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	55.7	34.5	56.8	57.8	65.6	46.5	52.6 K	75.6 K
7440-41-7	BERYLLIUM	1.1	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	0.81	0.46 J	0.6	0.6	0.58	0.48	0.6	0.84
7440-43-9	CADMIUM	2.5	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	0.2 J	0.079 U	0.35	0.13 J	0.16 J	0.085 J	0.23 J	0.1 J
7440-70-2	CALCIUM	2060	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	13700 [BKG]	1990	3690 [BKG]	2580 [BKG]	3610 [BKG]	3650 [BKG]	610 K	399 K
7440-47-3	**CHROMIUM**	33.4	**26**	12000	12000	2000000000	26	NC	NC	NC	NC	NC	NC	29.2 [PAL] [MDRES] [SSL]	17.1	33.0 [PAL] [MDRES] [SSL]	32.9 [PAL] [MDRES] [SSL]	**40.0 [BKG] [PAL] [MDRES] [SSL]**	22.7	14.6 K	15.5 K
7440-48-4	COBALT	22.3	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	10.3 [PAL] [ORNL]	6.2 [PAL] [ORNL]	5.7 [PAL] [ORNL]	5.2 [PAL] [ORNL]	7.2 [PAL] [ORNL]	4.6 [PAL] [ORNL]	4.6 [PAL] [ORNL]	6.4 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	24.3 J [BKG]	7.3 J	12.1 J	9.8 J	15.8 J	6.3 J	8.8 J	6.7 J
7439-89-6	IRON	38500	5500	5500	5500	NA	11	NC	NC	NC	NC	NC	NC	19400 [PAL] [ORNL] [MDRES] [SSL]	12700 [PAL] [ORNL] [MDRES] [SSL]	12100 [PAL] [ORNL] [MDRES] [SSL]	13900 [PAL] [ORNL] [MDRES] [SSL]	12900 [PAL] [ORNL] [MDRES] [SSL]	10700 [PAL] [ORNL] [MDRES] [SSL]	9010 [PAL] [ORNL] [MDRES] [SSL]	9520 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	24.7 [PAL] [SSL]	13.4 [PAL] [SSL]	61.2 [PAL] [SSL]	53.2 [PAL] [SSL]	17.7 [PAL] [SSL]	12.9 [PAL] [SSL]	26.5 [PAL] [SSL]	18.2 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	6.2 [PAL] [OPLNT]	6.5 [PAL] [OPLNT]	9.8 [PAL] [OPLNT]	11.0 [PAL] [OPLNT]	13.1 [PAL] [OPLNT]	8.0 [PAL] [OPLNT]	7.2 [PAL] [OPLNT]	8.6 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	4400 [BKG]	1590	3030 [BKG]	2330 [BKG]	**7480 [BKG] [PAL] [BTAG]**	2830 [BKG]	936	1040
7439-96-5	MANGANESE	1390	160	180	160	950	220	NC	NC	NC	NC	NC	NC	489 [PAL] [ORNL] [MDRES] [SSL]	158	327 [PAL] [ORNL] [MDRES] [SSL]	198 [PAL] [ORNL] [MDRES]	212 [PAL] [ORNL] [MDRES]	140	335 [PAL] [ORNL] [MDRES] [SSL]	413 [PAL] [ORNL] [MDRES] [SSL]
7439-97-6	**MERCURY**	0.16	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	0.028 U	0.017 J	0.053	0.018 J	0.045 J	0.025 J	0.052	0.031 J
7440-02-0	NICKEL	15.4	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	22.9 [BKG]	14.3	24.7 [BKG]	18.1 [BKG]	34.5 [BKG]	15.1	8.1	9.6
7440-09-7	POTASSIUM	1470	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	712	750	1180	1300	1940 [BKG]	1140	983	957
7782-49-2	SELENIUM	1.2	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	0.094 J	0.032 J	0.081 J	0.032 UL	0.066 UL	0.032 UL	0.066 U	0.089 J
7440-22-4	SILVER	0.84	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	0.17 UL	0.079 UL	0.081 UL	0.082 UL	0.083 UL	0.079 UL	0.081 UL	0.081 UL
7440-23-5	SODIUM	120	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	200 [BKG]	94.0	70.0	71.4	80.9	33.4	27.0	30.6
7440-24-6	STRONTIUM	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	32.0	7.4	12.3	10.4 K	14.1	8.3	6.7 K	6.5 K
7440-31-5	TIN	NA	0.89	4700	4700	NA	NA	0.89	NC	NC	NC	NC	NC	1.7 U	0.79 U	0.81 U	0.83 U	0.83 U	0.79 U	0.81 U	0.82 U
7440-62-2	VANADIUM	53.3	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	26.2 J [PAL] [MDRES] [SSL]	21.1 J [PAL] [MDRES] [SSL]	32.1 J [PAL] [MDRES] [SSL]	31.1 J [PAL] [MDRES] [SSL]	29.0 J [PAL] [MDRES] [SSL]	20.5 J [PAL] [MDRES] [SSL]	24.6 K [PAL] [MDRES] [SSL]	24.8 K [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	43.3 [BKG]	24.2	**55.2 [BKG] [PAL] [SSL]**	40.5 [BKG]	**56.5 [BKG] [PAL] [SSL]**	33.1	26.3 K	27.1 K
	Miscellaneous Parameters																				
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							49	
TTNUS288	PERCENT MOISTURE (%)			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							25	
TTNUS002	PH (S.U.)	8.8		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							5.52	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							18100	
TTNUS046	**TOTAL SOLIDS (%)**	79.2		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC							75	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 13-4

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				a09	a10	a11	a12	a13	a14	a15	a16	a17	a18
				009	010	011	012	013	014	015	016	017	018
				X28SS0050006	X28SS0050006-D	X28SS0050024	X28SS0060006	X28SS0060024	X28SS0060024-D	X28SS0070006	X28SS0070024	X28SS0080006	X28SS0080024
				X28SB005	X28SB005	X28SB005	X28SB006	X28SB006	X28SB006	X28SB007	X28SB007	X28SB008	X28SB008
				00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
				X28SS0050006	FD012110-02	X28SS0050024	X28SS0060006	X28SS0060024	FD012110-01	X28SS0070006	X28SS0070024	X28SS0080006	X28SS0080024
				20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100120	20100120
				20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121
				ORIG	DUP	NORMAL	NORMAL	ORIG	DUP	NORMAL	NORMAL	NORMAL	NORMAL
	matrix			SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
	duplicate				X28SS0050006				X28SS0060024				
	top_depth			0	0	0	0	0	0	0	0	0	0
	bottom_dep			0.5	0.5	2	0.5	2	2	0.5	2	0.5	2
	submatrix			SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
cas	sort	utl95val	minorpal	c_009	c_010	c_011	c_012	c_013	c_014	c_015	c_016	c_017	c_018
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2 UJ	0.2 U	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2 UJ	0.2 U	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	1.2 UJ	1.2 U	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U
78-11-5	PETN	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	0.2 UR	0.2 U	0.2 UR	0.2 UR	0.2 U	0.2 U	0.2 UR	0.2 UR	0.2 UR	0.2 U
	Inorganics (mg/kg)												
7429-90-5	ALUMINUM	19700	7700	7670 L [SSL]	8180 [PAL] [ORNL] [MDRES] [SSL]	11000 L [PAL] [ORNL] [MDRES] [SSL]	5130 L [SSL]	13600 [PAL] [ORNL] [MDRES] [SSL]	10300 [PAL] [ORNL] [MDRES] [SSL]	14100 L [PAL] [ORNL] [MDRES] [SSL]	12300 L [PAL] [ORNL] [MDRES] [SSL]	17300 L [PAL] [ORNL] [MDRES] [SSL]	17600 L [PAL] [ORNL] [MDRES] [SSL]
7440-36-0	ANTIMONY	NA	0.27	0.032 UL	0.033 U	0.032 UL	0.032 UL	0.064 J	0.033 U	0.033 J	0.033 UL	0.064 UL	0.12 UL
7440-38-2	ARSENIC	14.9	0.026	1.2 L [PAL] [ORNL] [MDRES] [MDSGW]	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	1.9 L [PAL] [ORNL] [MDRES] [MDSGW]	0.94 L [PAL] [ORNL] [MDRES] [MDSGW]	3.0 [PAL] [ORNL] [MDRES] [MDSGW]	2.1 [PAL] [ORNL] [MDRES] [MDSGW]	2.6 L [PAL] [ORNL] [MDRES] [MDSGW]	2.1 L [PAL] [ORNL] [MDRES] [MDSGW]	3.1 L [PAL] [ORNL] [MDRES] [MDSGW]	2.9 L [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	50.6	62.2	53.8	65.3	53.6 K	66.6	61.5	63.9	54.4	60.6
7440-41-7	BERYLLIUM	1.1	16	0.5	0.63	0.55	0.53	0.57	0.66	0.67	0.61	0.69	0.74
7440-43-9	CADMIUM	2.5	0.36	0.082 U	0.081 U	0.08 U	0.083 U	0.081 U	0.083 U	0.081 U	0.083 U	0.082 U	0.17 U
7440-70-2	CALCIUM	2060	NA	297 J	513 J	426	346	328 K	440	345	307	2270 [BKG]	2140 [BKG]
7440-47-3	**CHROMIUM**	33.4	26	13.7	18.5	15.8	16.5	22.0 K	25.7 [PAL] [MDRES]	20.1	16.3	**35.0 [BKG] [PAL] [MDRES] [SSL]**	**38.2 [BKG] [PAL] [MDRES] [SSL]**
7440-48-4	COBALT	22.3	2.3	3.2 [PAL] [ORNL]	5.3 [PAL] [ORNL]	3.5 [PAL] [ORNL]	3.9 [PAL] [ORNL]	3.6 [PAL] [ORNL]	4.9 [PAL] [ORNL]	5.5 [PAL] [ORNL]	4.9 [PAL] [ORNL]	6.9 [PAL] [ORNL]	6.6 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	6.6 J	**33.1 J [BKG] [PAL] [SSL]**	5.8 J	10.3 J	**54.7 J [BKG] [PAL] [SSL]**	9.2 J	**34.9 J [BKG] [PAL] [SSL]**	**29.0 J [BKG] [PAL] [SSL]**	9.6 J	10.6 J
7439-89-6	IRON	38500	5500	7140 J [PAL] [ORNL] [MDRES] [SSL]	13800 J [PAL] [ORNL] [MDRES] [SSL]	10200 [PAL] [ORNL] [MDRES] [SSL]	9710 [PAL] [ORNL] [MDRES] [SSL]	15300 [PAL] [ORNL] [MDRES] [SSL]	17500 [PAL] [ORNL] [MDRES] [SSL]	14200 [PAL] [ORNL] [MDRES] [SSL]	11000 [PAL] [ORNL] [MDRES] [SSL]	17200 [PAL] [ORNL] [MDRES] [SSL]	20600 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	12.1 J [PAL] [SSL]	**139 J [BKG] [PAL] [SSL]**	11.3 [PAL] [SSL]	17.3 [PAL] [SSL]	8.1	11.6 [PAL] [SSL]	**198 [BKG] [PAL] [SSL]**	**172 [BKG] [PAL] [SSL]**	14.7 [PAL] [SSL]	13.8 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	5.2 J [PAL] [OPLNT]	9.4 J [PAL] [OPLNT]	6.9 [PAL] [OPLNT]	6.6 [PAL] [OPLNT]	10.0 [PAL] [OPLNT]	10.8 [PAL] [OPLNT]	10.4 [PAL] [OPLNT]	8.4 [PAL] [OPLNT]	12.0 [PAL] [OPLNT]	14.5 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	800 J	1360 J	1040	1110	1440	1680 [BKG]	1440	1170	3400 [BKG]	3470 [BKG]
7439-96-5	MANGANESE	1390	160	302 [PAL] [ORNL] [MDRES] [SSL]	328 [PAL] [ORNL] [MDRES] [SSL]	261 [PAL] [ORNL] [MDRES] [SSL]	209 [PAL] [ORNL] [MDRES]	146	181 [PAL] [ORNL] [MDRES]	278 [PAL] [ORNL] [MDRES] [SSL]	302 [PAL] [ORNL] [MDRES] [SSL]	179 [PAL] [MDRES]	143
7439-97-6	**MERCURY**	0.16	0.058	0.019 J	0.024	0.021 J	0.015 J	0.025 J	0.022 J	0.035 J	0.024 J	0.03 J	0.026 U
7440-02-0	NICKEL	15.4	38	5.9 J	12.6 J	8.3	8.0	11.3	14.3	12.8	11.1	27.4 [BKG]	26.7 [BKG]
7440-09-7	POTASSIUM	1470	NA	676 J	1390 J	894	1170	1700 [BKG]	1940 [BKG]	1390	1180	1680 [BKG]	2090 [BKG]
7782-49-2	SELENIUM	1.2	0.52	0.054 J	0.033 U	0.032 UL	0.032 UL	0.066 U	0.036 J	0.032 UL	0.033 UL	0.064 UL	0.12 UL
7440-22-4	SILVER	0.84	4.2	**19.5 J [BKG] [PAL] [SSL]**	0.093 J	1.8 [BKG]	1.8 [BKG]	0.24 L	0.43 L	0.081 UL	0.083 UL	0.082 UL	0.17 UL
7440-23-5	SODIUM	120	NA	17.1 J	26.3	17.8 J	20.5 J	22.9 J	25.9	24.8	25.9	78.3	91.1
7440-24-6	STRONTIUM	NA	120	4.1	6.4	5.1	5.5	5.9 K	6.9	5.9	5.7	9.2	10.0
7440-31-5	TIN	NA	0.89	0.82 U	2.9 [PAL] [BTAG]	0.8 U	0.83 U	0.81 U	0.83 U	3.1 [PAL] [BTAG]	3.8 [PAL] [BTAG]	0.82 U	1.7 U
7440-62-2	VANADIUM	53.3	7.8	15.9 J [PAL] [MDRES] [SSL]	28.9 [PAL] [MDRES] [SSL]	21.4 J [PAL] [MDRES] [SSL]	21.3 J [PAL] [MDRES] [SSL]	28.7 K [PAL] [MDRES] [SSL]	32.5 [PAL] [MDRES] [SSL]	30.0 J [PAL] [MDRES] [SSL]	23.7 J [PAL] [MDRES] [SSL]	34.2 J [PAL] [MDRES] [SSL]	39.7 J [PAL] [ORNL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	23.6	33.3	25.8	30.3	36.4 K	34.8	33.1	27.5	42.2 [BKG]	45.2 [BKG]
	Miscellaneous Parameters												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100							48.4					
TTNUS288	PERCENT MOISTURE (%)							16.6					
TTNUS002	PH (S.U.)	8.8						5.82					
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200						4670					
TTNUS046	**TOTAL SOLIDS (%)**	79.2						**83.4 [BKG]**					

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 13-4

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				a19	a20	a21	a22	a23	a24	a25	a26	a27	a28
				019	020	021	022	023	024	025	026	027	028
				X28SS0090006	X28SB009	X28SS0100006	X28SB010	X28SS0110006	X28SB011	X28SS0120006	X28SB012	X28SS0130006	X28SB013
				00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
				X28SS0090006	X28SS0090024	X28SS0100006	X28SS0100024	X28SS0110006	X28SS0110024	X28SS0120006	X28SS0120024	X28SS0130006	X28SS0130024
				20100120	20100120	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121
				20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121
				NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
	matrix			SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
	duplicate												
	top_depth			0	0	0	0	0	0	0	0	0	0
	bottom_dep			0.5	2	0.5	2	0.5	2	0.5	2	0.5	2
	submatrix			SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
cas	sort	utl95val	minorpat	c_019	c_020	c_021	c_022	c_023	c_024	c_025	c_026	c_027	c_028
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.24 U	0.25 U	0.24 U	0.25 U	0.25 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.24 U	0.25 U	0.25 U	0.25 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	0.58 J	1.2 U	1.2 U	1.2 U
78-11-5	PETN	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	0.2 UR	0.2 UR	0.2 UR	0.2 UR	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	Inorganics (mg/kg)												
7429-90-5	ALUMINUM	19700	7700	10100 L [PAL] [ORNL] [MDRES] [SSL]	10000 L [PAL] [ORNL] [MDRES] [SSL]	8070 L [PAL] [ORNL] [MDRES] [SSL]	11000 L [PAL] [ORNL] [MDRES] [SSL]	8320 [PAL] [ORNL] [MDRES] [SSL]	11000 [PAL] [ORNL] [MDRES] [SSL]	12400 [PAL] [ORNL] [MDRES] [SSL]	12200 [PAL] [ORNL] [MDRES] [SSL]	3820 [SSL]	3670 [SSL]
7440-36-0	ANTIMONY	NA	0.27	0.2 UJ [BKG] [PAL] [SSL]	0.2 UJ [BKG] [PAL] [SSL]	0.2 UJ [BKG] [PAL] [SSL]	0.2 UJ [BKG] [PAL] [SSL]	0.044 J	0.033 UL	0.076 J	0.066 U	0.036 J	0.033 UL
7440-38-2	ARSENIC	14.9	0.026	4.8 L [PAL] [ORNL] [MDRES] [MDSGW]	2.8 L [PAL] [ORNL] [MDRES] [MDSGW]	5.1 L [PAL] [ORNL] [MDRES] [MDSGW]	3.4 L [PAL] [ORNL] [MDRES] [MDSGW]	1.3 [PAL] [ORNL] [MDRES] [MDSGW]	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	0.95 [PAL] [ORNL] [MDRES] [MDSGW]	0.74 [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	50.3	48.6	114 [BKG]	111 [BKG]	51.5 K	63.8 K	59.3 K	48.1 K	49.7 K	46.2 K
7440-41-7	BERYLLIUM	1.1	16	0.49	0.55	0.6	0.79	0.56	0.59	0.66	0.57	0.53	0.43 J
7440-43-9	CADMIUM	2.5	0.36	0.08 U	0.08 U	0.78 [PAL] [SSL]	0.3 K	0.08 U	0.081 U	0.081 U	0.08 U	0.082 J	0.08 U
7440-70-2	CALCIUM	2060	NA	587	586	989	767	260 K	245 K	572 K	681 K	848 K	1040 K
7440-47-3	**CHROMIUM**	33.4	**26**	18.4	24.2 [PAL] [MDRES]	18.5	18.9	13.6 K	13.3 K	20.7 K	22.2 K	15.7 K	13.9 K
7440-48-4	COBALT	22.3	2.3	3.6 [PAL] [ORNL]	3.3 [PAL] [ORNL]	4.7 [PAL] [ORNL]	5.2 [PAL] [ORNL]	3.7 [PAL] [ORNL]	3.7 [PAL] [ORNL]	5.2 [PAL] [ORNL]	3.7 [PAL] [ORNL]	3.8 [PAL] [ORNL]	4.3 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	23.7 J [BKG]	15.6 J	**50.0 J [BKG] [PAL] [SSL]**	**30.5 J [BKG] [PAL] [SSL]**	9.9 J	5.2 J	12.3 J	8.2 J	**44.5 J [BKG] [PAL] [SSL]**	21.0 J [BKG]
7439-89-6	IRON	38500	5500	10800 [PAL] [ORNL] [MDRES] [SSL]	13600 [PAL] [ORNL] [MDRES] [SSL]	16900 [PAL] [ORNL] [MDRES] [SSL]	14100 [PAL] [ORNL] [MDRES] [SSL]	9000 [PAL] [ORNL] [MDRES] [SSL]	8120 [PAL] [ORNL] [MDRES] [SSL]	13500 [PAL] [ORNL] [MDRES] [SSL]	13900 [PAL] [ORNL] [MDRES] [SSL]	8930 [PAL] [ORNL] [MDRES] [SSL]	8060 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	59.2 [PAL] [SSL]	33.2 [PAL] [SSL]	**112 [BKG] [PAL] [SSL]**	44.2 [PAL] [SSL]	17.6 [PAL] [SSL]	8.7	27.2 [PAL] [SSL]	13.5 [PAL] [SSL]	20.5 [PAL] [SSL]	15.7 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	7.7 [PAL] [OPLNT]	9.6 [PAL] [OPLNT]	6.5 [PAL] [OPLNT]	9.5 [PAL] [OPLNT]	6.2 [PAL] [OPLNT]	7.3 [PAL] [OPLNT]	9.7 [PAL] [OPLNT]	8.9 [PAL] [OPLNT]	6.0 [PAL] [OPLNT]	5.5 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	1080	1380	857	1170	878	924	1470	1410	943	897
7439-96-5	MANGANESE	1390	160	169 [PAL] [MDRES]	119	673 [PAL] [ORNL] [MDRES] [SSL]	528 [PAL] [ORNL] [MDRES] [SSL]	281 [PAL] [ORNL] [MDRES] [SSL]	253 [PAL] [ORNL] [MDRES] [SSL]	274 [PAL] [ORNL] [MDRES] [SSL]	158	279 [PAL] [ORNL] [MDRES] [SSL]	211 [PAL] [ORNL] [MDRES]
7439-97-6	**MERCURY**	0.16	0.058	0.022	0.017 J	0.08 [PAL] [BTAG]	0.042 J	0.042	0.021 J	0.034 J	0.024 J	0.021 J	0.014 U
7440-02-0	NICKEL	15.4	38	6.9	9.8	11.6	12.9	6.5	6.8	10.6	9.8	6.9	6.7
7440-09-7	POTASSIUM	1470	NA	1480 [BKG]	1960 [BKG]	746	1000	811	718	1530 [BKG]	1630 [BKG]	1040	879
7782-49-2	SELENIUM	1.2	0.52	0.031 UL	0.033 UL	0.21 L	0.038 J	0.032 U	0.066 U	0.066 U	0.066 U	0.033 U	0.033 U
7440-22-4	SILVER	0.84	4.2	0.08 UL	0.08 UL	1.8 L [BKG]	0.53 L	0.4 L	0.081 UL	0.33 L	0.14 J	0.08 UL	0.08 UL
7440-23-5	SODIUM	120	NA	26.4	38.1	40.8	44.7	18.9 J	19.8 J	29.1	29.4	22.0 J	18.7 J
7440-24-6	STRONTIUM	NA	120	12.8	13.3	11.8	11.3	4.6 K	4.8 K	7.0 K	6.0 K	5.9 K	5.4 K
7440-31-5	TIN	NA	0.89	0.8 U	0.8 U	2.4 J [PAL] [BTAG]	5.1 [PAL] [BTAG]	0.8 U	0.81 U	1.9 J [PAL] [BTAG]	0.8 U	0.81 J	0.8 U
7440-62-2	VANADIUM	53.3	7.8	22.7 J [PAL] [MDRES] [SSL]	29.3 J [PAL] [MDRES] [SSL]	18.3 J [PAL] [MDRES] [SSL]	24.3 J [PAL] [MDRES] [SSL]	19.3 K [PAL] [MDRES] [SSL]	18.6 K [PAL] [MDRES] [SSL]	27.4 K [PAL] [MDRES] [SSL]	26.7 K [PAL] [MDRES] [SSL]	20.3 K [PAL] [MDRES] [SSL]	17.2 K [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	43.2 [BKG]	34.2	**464 [BKG] [PAL] [SSL]**	**483 [BKG] [PAL] [SSL]**	23.9 K	22.3 K	36.2 K	28.9 K	38.5 K [BKG]	33.8 K
	Miscellaneous Parameters												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100												
TTNUS288	PERCENT MOISTURE (%)												
TTNUS002	PH (S.U.)	8.8											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200											
TTNUS046	**TOTAL SOLIDS (%)**	79.2											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				a29	a30	a31	a32	a33	a34	a35	a36	a37	a38
				029	030	031	032	033	034	035	036	037	038
				X28SS0140006	X28SS0140024	X28SS0150006	X28SS0150024	X28SS0160006	X28SS0160024	X28SS0170006	X28SS0170024	X28SS0180006	X28SS0180024
				X28SB014	X28SB014	X28SB015	X28SB015	X28SB016	X28SB016	X28SB017	X28SB017	X28SB018	X28SB018
				00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
				X28SS0140006	X28SS0140024	X28SS0150006	X28SS0150024	X28SS0160006	X28SS0160024	X28SS0170006	X28SS0170024	X28SS0180006	X28SS0180024
				20100120	20100120	20100120	20100120	20100121	20100121	20100121	20100121	20100120	20100120
				20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121	20100121
				NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
	matrix			SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
	duplicate												
	top_depth			0	0	0	0	0	0	0	0	0	0
	bottom_dep			0.5	2	0.5	2	0.5	2	0.5	2	0.5	2
	submatrix			SS	SS	SS	SS	SS	SS	SS	SS	SS	SS
cas	sort	utl95val	minorpal	c_029	c_030	c_031	c_032	c_033	c_034	c_035	c_036	c_037	c_038
	Explosives (mg/kg)												
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	1.2 U	1.2 UJ	1.2 UJ	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
78-11-5	PETN	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	0.2 U	0.2 UR	0.2 UR	0.2 UR	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
	Inorganics (mg/kg)												
7429-90-5	ALUMINUM	19700	7700	14200 [PAL] [ORNL] [MDRES] [SSL]	13200 L [PAL] [ORNL] [MDRES] [SSL]	13300 L [PAL] [ORNL] [MDRES] [SSL]	11600 L [PAL] [ORNL] [MDRES] [SSL]	8810 [PAL] [ORNL] [MDRES] [SSL]	15000 [PAL] [ORNL] [MDRES] [SSL]	7850 [PAL] [ORNL] [MDRES] [SSL]	9830 [PAL] [ORNL] [MDRES] [SSL]	18200 [PAL] [ORNL] [MDRES] [SSL]	16700 [PAL] [ORNL] [MDRES] [SSL]
7440-36-0	**ANTIMONY**	NA	0.27	0.16 L	0.066 J	**0.73 L [PAL] [SSL]**	**0.66 L [PAL] [SSL]**	0.033 UL	0.033 UL	0.033 UL	0.033 UL	0.16 UL	0.11 L
7440-38-2	ARSENIC	14.9	0.026	4.6 [PAL] [ORNL] [MDRES] [MDSGW]	4.0 L [PAL] [ORNL] [MDRES] [MDSGW]	8.0 L [PAL] [ORNL] [MDRES] [MDSGW]	7.9 L [PAL] [ORNL] [MDRES] [MDSGW]	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	2.0 [PAL] [ORNL] [MDRES] [MDSGW]	1.3 [PAL] [ORNL] [MDRES] [MDSGW]	1.7 [PAL] [ORNL] [MDRES] [MDSGW]	3.3 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	48.7 K	40.7	71.0	99.6 [BKG]	45.0 K	59.9 K	41.4 K	55.6 K	77.0 K	57.5 K
7440-41-7	BERYLLIUM	1.1	16	0.57	0.61	0.59	0.68	0.46 J	0.75	0.53	0.71	0.72	0.7 J
7440-43-9	CADMIUM	2.5	0.36	0.1 J	0.082 U	0.2 J	0.27 K	0.079 U	0.082 U	0.082 U	0.081 U	0.082 U	0.15 U
7440-70-2	CALCIUM	2060	NA	460 K	333	444	625	241 K	216 K	250 K	187 K	846 K	555 K
7440-47-3	**CHROMIUM**	33.4	**26**	23.8 K [PAL] [MDRES]	27.4 [PAL] [MDRES] [SSL]	23.3 [PAL] [MDRES]	24.5 [PAL] [MDRES]	13.6 K	23.2 K [PAL] [MDRES]	15.7 K	21.2 K	22.6 K	27.8 K [PAL] [MDRES] [SSL]
7440-48-4	COBALT	22.3	2.3	4.1 [PAL] [ORNL]	3.2 [PAL] [ORNL]	4.2 [PAL] [ORNL]	5.0 [PAL] [ORNL]	5.8 [PAL] [ORNL]	5.7 [PAL] [ORNL]	5.4 [PAL] [ORNL]	5.6 [PAL] [ORNL]	7.3 [PAL] [ORNL]	4.9 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	14.2 J	8.1 J	**37.4 J [BKG] [PAL] [SSL]**	**41.2 J [BKG] [PAL] [SSL]**	4.8 J	6.8 J	5.3 J	6.4 J	9.9 J	9.1 J
7439-89-6	IRON	38500	5500	13900 [PAL] [ORNL] [MDRES] [SSL]	15000 [PAL] [ORNL] [MDRES] [SSL]	12600 [PAL] [ORNL] [MDRES] [SSL]	13800 [PAL] [ORNL] [MDRES] [SSL]	8970 [PAL] [ORNL] [MDRES] [SSL]	16200 [PAL] [ORNL] [MDRES] [SSL]	9710 [PAL] [ORNL] [MDRES] [SSL]	13800 [PAL] [ORNL] [MDRES] [SSL]	16400 [PAL] [ORNL] [MDRES] [SSL]	18500 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	19.9 [PAL] [SSL]	11.3 [PAL] [SSL]	**78.3 [BKG] [PAL] [SSL]**	53.1 [PAL] [SSL]	19.2 [PAL] [SSL]	11.7 [PAL] [SSL]	18.1 [PAL] [SSL]	13.4 [PAL] [SSL]	54.0 [PAL] [SSL]	25.9 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	9.4 [PAL] [OPLNT]	9.1 [PAL] [OPLNT]	9.4 [PAL] [OPLNT]	9.5 [PAL] [OPLNT]	8.4 [PAL] [OPLNT]	14.1 [PAL] [OPLNT]	7.3 [PAL] [OPLNT]	9.8 [PAL] [OPLNT]	16.5 [PAL] [ORNL] [OPLNT]	13.9 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	1470	1700 [BKG]	1280	1300	805	1300	920	1250	1400	1620
7439-96-5	MANGANESE	1390	160	215 [PAL] [ORNL] [MDRES]	143	187 [PAL] [ORNL] [MDRES]	243 [PAL] [ORNL] [MDRES] [SSL]	198 [PAL] [ORNL] [MDRES]	112	185 [PAL] [ORNL] [MDRES]	153	215 [PAL] [ORNL] [MDRES]	136
7439-97-6	**MERCURY**	0.16	0.058	0.075 [PAL] [BTAG]	0.038 J	0.037	0.026 J	0.033 J	0.02 J	0.03 J	0.02 J	**0.85 [BKG] [PAL] [BTAG]**	**0.33 [BKG] [PAL] [BTAG]**
7440-02-0	NICKEL	15.4	38	9.0	10.5	8.0	10.3	6.6	8.3	7.3	9.5	13.7	9.9
7440-09-7	POTASSIUM	1470	NA	1880 [BKG]	2590 [BKG]	1890 [BKG]	1680 [BKG]	832	1310	904	1210	1570 [BKG]	1970 [BKG]
7782-49-2	SELENIUM	1.2	0.52	0.065 UL	0.033 UL	0.054 J	0.067 J	0.033 U	0.066 U	0.033 U	0.033 U	0.066 U	0.066 U
7440-22-4	SILVER	0.84	4.2	0.08 UL	0.082 UL	0.13 J	0.092 J	0.079 UL	0.082 UL	0.082 UL	0.081 UL	0.082 UL	0.15 UL
7440-23-5	SODIUM	120	NA	25.5	26.1	30.5	31.2	31.8	38.1	20.9 J	25.1	53.1	33.4 J
7440-24-6	STRONTIUM	NA	120	9.3 K	9.5	22.4	40.3	4.9 K	5.7 K	4.4 K	4.6 K	13.0 K	11.2 K
7440-31-5	TIN	NA	0.89	0.81 U	0.82 U	3.4 [PAL] [BTAG]	2.1 J [PAL] [BTAG]	0.79 U	0.82 U	0.83 U	0.98 J [PAL] [BTAG]	0.82 U	1.5 U
7440-62-2	VANADIUM	53.3	7.8	29.5 K [PAL] [MDRES] [SSL]	28.7 J [PAL] [MDRES] [SSL]	27.7 J [PAL] [MDRES] [SSL]	26.8 J [PAL] [MDRES] [SSL]	21.8 K [PAL] [MDRES] [SSL]	31.3 K [PAL] [MDRES] [SSL]	22.4 K [PAL] [MDRES] [SSL]	28.7 K [PAL] [MDRES] [SSL]	36.6 K [PAL] [MDRES] [SSL]	36.6 K [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	39.6 K [BKG]	31.5	**85.0 [BKG] [PAL] [SSL]**	**119 [BKG] [PAL] [SSL]**	21.9 K	26.6 K	22.3 K	28.7 K	**53.4 K [BKG] [PAL] [SSL]**	38.5 K [BKG]
	Miscellaneous Parameters												
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100												
TTNUS288	PERCENT MOISTURE (%)												
TTNUS002	PH (S.U.)	8.8											
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200											
TTNUS046	**TOTAL SOLIDS (%)**	79.2											

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
UJ – The analytical method could not detect the analyte at the sample specific detection limit; however, the sample-specific detection limit may be inaccurate or imprecise based on validation review criteria. The associated numerical detection limit may be inaccurate
J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
L –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased low.
K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 13-4

SURFACE SOIL SAMPLING RESULTS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

				a39	a40	a41	a42
				039	040	041	042
				X28SS0190006	X28SS0190024	X28SS0200006	X28SS0200024
				X28SB019	X28SB019	X28SB020	X28SB020
				00810_20100422	00810_20100422	00810_20100422	00810_20100422
				X28SS0190006	X28SS0190024	X28SS0200006	X28SS0200024
				20100120	20100120	20100121	20100121
				20100121	20100121	20100121	20100121
				NORMAL	NORMAL	NORMAL	NORMAL
	matrix			SO	SO	SO	SO
	duplicate						
	top_depth			0	0	0	0
	bottom_dep			0.5	2	0.5	2
	submatrix			SS	SS	SS	SS
cas	sort	utl95val	minorpal	c_039	c_040	c_041	c_042
	Explosives (mg/kg)						
99-35-4	1,3,5-TRINITROBENZENE	NA	9	0.2 U	0.2 U	0.2 U	0.2 U
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U
118-96-7	2,4,6-TRINITROTOLUENE	NA	3.6	0.25 U	0.25 U	0.25 U	0.24 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	0.2 U	0.2 U	0.2 U	0.2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	0.2 U	0.2 U	0.2 U	0.2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	0.2 U	0.2 U	0.2 U	0.2 U
618-87-1	3,5-DINITROANILINE	NA	NA	0.25 U	0.25 U	0.25 U	0.24 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.2 U	0.2 U	0.2 U	0.2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	0.2 U	0.2 U	0.2 U	0.2 U
99-99-0	4-NITROTOLUENE	0.21	30	0.2 U	0.2 U	0.2 U	0.2 U
2691-41-0	HMX	NA	380	0.2 U	0.2 U	0.2 U	0.2 U
98-95-3	NITROBENZENE	NA	0.023	0.2 U	0.2 U	0.2 U	0.2 U
55-63-0	NITROGLYCERIN	NA	0.61	1.2 U	1.2 U	1.2 U	1.2 U
78-11-5	PETN	NA	NA	1.2 U	1.2 U	1.2 U	1.2 U
121-82-4	RDX	NA	5.5	1.3	0.2 U	0.2 U	0.2 U
479-45-8	TETRYL	NA	24	0.2 U	0.2 U	0.2 U	0.2 U
	Inorganics (mg/kg)						
7429-90-5	ALUMINUM	19700	7700	12900 [PAL] [ORNL] [MDRES] [SSL]	14900 [PAL] [ORNL] [MDRES] [SSL]	9730 [PAL] [ORNL] [MDRES] [SSL]	14600 [PAL] [ORNL] [MDRES] [SSL]
7440-36-0	ANTIMONY	NA	0.27	0.099 L	0.16 J	0.14 J	0.091 J
7440-38-2	ARSENIC	14.9	0.026	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	3.6 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	3.6 [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	62.3 K	50.4 K	41.5 K	49.0 K
7440-41-7	BERYLLIUM	1.1	16	0.61	0.55	0.57	0.76 J
7440-43-9	CADMIUM	2.5	0.36	0.095 J	0.079 U	0.1 J	0.16 U
7440-70-2	CALCIUM	2060	NA	813 K	541 K	306 K	247 K
7440-47-3	**CHROMIUM**	33.4	**26**	26.2 K [PAL] [MDRES] [SSL]	25.0 K [PAL] [MDRES]	17.7 K	29.1 K [PAL] [MDRES] [SSL]
7440-48-4	COBALT	22.3	2.3	4.9 [PAL] [ORNL]	3.3 [PAL] [ORNL]	4.2 [PAL] [ORNL]	5.3 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	13.4 J	9.2 J	16.0 J	22.3 J [BKG]
7439-89-6	IRON	38500	5500	14000 [PAL] [ORNL] [MDRES] [SSL]	14500 [PAL] [ORNL] [MDRES] [SSL]	11300 [PAL] [ORNL] [MDRES] [SSL]	20200 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	36.5 [PAL] [SSL]	60.6 [PAL] [SSL]	32.7 [PAL] [SSL]	21.2 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	9.6 [PAL] [OPLNT]	8.8 [PAL] [OPLNT]	7.7 [PAL] [OPLNT]	11.7 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	1490	1490	902	1460
7439-96-5	MANGANESE	1390	160	298 [PAL] [ORNL] [MDRES] [SSL]	124	121	112
7439-97-6	**MERCURY**	0.16	0.058	0.094 [PAL] [BTAG]	0.065 [PAL] [BTAG]	0.036 J	0.036 J
7440-02-0	NICKEL	15.4	38	11.5	9.6	6.8	9.7
7440-09-7	POTASSIUM	1470	NA	1810 [BKG]	2040 [BKG]	1090	1920 [BKG]
7782-49-2	SELENIUM	1.2	0.52	0.065 U	0.065 U	0.075 J	0.065 U
7440-22-4	SILVER	0.84	4.2	0.083 UL	0.079 UL	0.083 UL	0.16 UL
7440-23-5	SODIUM	120	NA	29.0	21.9 J	24.6 J	38.6 J
7440-24-6	STRONTIUM	NA	120	7.0 K	5.2 K	6.2 K	6.5
7440-31-5	TIN	NA	0.89	0.83 U	0.79 U	0.83 U	1.6 U
7440-62-2	VANADIUM	53.3	7.8	28.0 K [PAL] [MDRES] [SSL]	26.3 K [PAL] [MDRES] [SSL]	23.9 K [PAL] [MDRES] [SSL]	34.4 K [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	**89.3 K [BKG] [PAL] [SSL]**	**91.9 K [BKG] [PAL] [SSL]**	35.5 K	44.8 K [BKG]
	Miscellaneous Parameters						
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100					127	
TTNUS288	PERCENT MOISTURE (%)					36.1	
TTNUS002	PH (S.U.)	8.8				5.8	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200				12000	
TTNUS046	**TOTAL SOLIDS (%)**	79.2				63.9	

mg/kg = milligram per kilogram
meq/100 - milliequivalents per 100
PAL = Project action limit
S.U. = Standard unit
utl95cv - upper tolerance limit background calculation.
Bold means chemical was detected.
Shading indicates an exceedence of the PAL.
Notes:
U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.
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J –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration.
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K –The chemical was present; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is an estimate of the true concentration and biased high.

TABLE 4-1

SUMMARY OF DESCRIPTIVE STATISTICS FOR ALL SURFACE AND SUBSURFACE SOILS
BACKGROUND INVESTIGATION REPORT FOR SOILS
INDIAN HEAD DIVISION
NSWC INDIAN HEAD, MARYLAND

Chemical	Cas Number	Frequency of Detection	Minimum Detection	Minimum Qualifier	Maximum Detection	Maximum Qualifier	Average of Positive Detections	Average of All Detections	Minimum Nondetect	Maximum Nondetect	Location of Maximum	Distribution of Data	95% Upper Confidence Limit	95% Upper Tolerance Limit	Eastern U.S. Soils [1]	Maryland Soils [2]	Residential Risk-Based Concentration [3]	Industrial Risk-Based Concentration [3]
Volatile Organic Compounds (ug/kg)																		
ACETONE	67-64-1	3/40	1800		13000	L	5700	430	1.4	24	RN6SS0170101	Undefined	13000	13000	NA	NA	7800000	200000000
CYCLOHEXANE	110-82-7	1/22	3.6	J	3.6	J	3.6	5.1	5.3	15	IS11SS420001	Undefined	3.6	3.6	NA	NA	NA	NA
ETHYLBENZENE	100-41-4	1/40	2.4	J	2.4	J	2.4	4.9	1.5	15	IS11SS400001	Undefined	2.4	2.4	NA	NA	7800000	200000000
GASOLINE RANGE ORGANICS	TTNUS005	2/9	0.1225		0.17		0.15	8.4	0.12	150	IS11SS420001	Undefined	0.17	0.17	NA	NA	NA	NA
METHYL ACETATE	79-20-9	1/22	2.3	J	2.3	J	2.3	5.0	5.3	15	IS11SS390001	Undefined	2.3	2.3	NA	NA	78000000	2000000000
STYRENE	100-42-5	1/40	1.3	J	1.3	J	1.3	5.0	0.34	15	BGDSS0120101-AVG	Undefined	1.3	1.3	NA	NA	16000000	410000000
TOLUENE	108-88-3	4/40	3.3	J	140	J	61	11	0.32	15	IS11SS400001	Undefined	140	140	NA	NA	16000000	410000000
TOTAL XYLENES	1330-20-7	5/24	1.7	J	9.9	J	5.6	6.5	0.78	18	IS11SS420001	Undefined	9.9	9.9	NA	NA	160000000	4100000000
TRICHLOROFLUOROMETHANE	75-69-4	7/40	1.7	J	2.7	J	2.2	4.9	0.33	15	BGDSB0110101	Undefined	2.7	2.7	NA	NA	23000000	610000000
Semivolatile Organic Compounds (ug/kg)																		
1,3-DINITROBENZENE	99-65-0	1/20	32	J	32	J	32	120	37.2	393	IS11SB260203	Undefined	32	32	NA	NA	7800	200000
2-METHYLNAPHTHALENE	91-57-6	1/40	73	L	73	L	73	140	42	490	IS21SS200001	Undefined	73	73	NA	NA	1600000	41000000
ACENAPHTHENE	83-32-9	1/40	140		140		140	140	38.7	490	BGDSS0160101	Undefined	140	140	NA	NA	4700000	120000000
ACETOPHENONE	98-86-2	3/40	46	J	64	J	58	140	52	490	IS11SS400001	Undefined	64	64	NA	NA	7800000	200000000
ANTHRACENE	120-12-7	1/40	260		260		260	140	26.2	490	BGDSS0160101	Undefined	260	260	NA	NA	23000000	610000000
BENZALDEHYDE	100-52-7	1/34	59	J	59	J	59	150	130	490	IS25SS190001	Undefined	59	59	NA	NA	7800000	200000000
BENZO(A)ANTHRACENE	56-55-3	1/40	480		480		480	150	13.6	490	BGDSS0160101	Undefined	480	480	NA	NA	870	7800
BENZO(A)PYRENE	50-32-8	1/40	390		**390**		390	150	16.9	490	BGDSS0160101	Undefined	390	390	NA	NA	**87**	780
BENZO(B)FLUORANTHENE	205-99-2	1/40	420		420		420	150	35	490	BGDSS0160101	Undefined	420	420	NA	NA	870	7800
BENZO(G,H,I)PERYLENE[5]	191-24-2	1/40	130		130		130	140	45	490	BGDSS0160101	Undefined	130	130	NA	NA	2300000	61000000
BENZO(K)FLUORANTHENE	207-08-9	1/40	360	J	360	J	360	150	41.6	490	BGDSS0160101	Undefined	360	360	NA	NA	8700	78000
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	14/40	51	J	7500	J	660	320	58	490	BGDSS0200101	Undefined	7500	7500	NA	NA	46000	410000
CARBAZOLE	86-74-8	1/34	130	J	130	J	130	140	35	490	BGDSS0160101	Undefined	130	130	NA	NA	32000	290000
CHRYSENE	218-01-9	1/40	440		440		440	150	21	490	BGDSS0160101	Undefined	440	440	NA	NA	87000	780000
DIBENZOFURAN	132-64-9	1/40	65	J	65	J	65	140	28.7	490	BGDSS0160101	Undefined	65	65	NA	NA	310000	8200000
FLUORANTHENE	206-44-0	2/40	65	J	1100		580	160	35	490	BGDSS0160101	Undefined	1100	1100	NA	NA	3100000	82000000
FLUORENE	86-73-7	1/40	150		150		150	140	27.1	490	BGDSS0160101	Undefined	150	150	NA	NA	3100000	82000000
INDENO(1,2,3-CD)PYRENE	193-39-5	1/40	100		100		100	140	46.4	490	BGDSS0160101	Undefined	100	100	NA	NA	870	7800
NAPHTHALENE	91-20-3	1/40	110	L	110	L	110	140	34.5	490	IS21SS200001	Undefined	110	110	NA	NA	1600000	41000000
PHENANTHRENE[5]	85-01-8	1/40	1100		1100		1100	160	35	490	BGDSS0160101	Undefined	1100	1100	NA	NA	2300000	61000000
PYRENE	129-00-0	2/40	120	J	880		500	160	35	490	BGDSS0160101	Undefined	880	880	NA	NA	2300000	61000000
Explosives (ug/kg)																		
2-NITROTOLUENE	88-72-2	1/15	150	J	150	J	150	100	81.4	250	IS11SS400001	Undefined	150	150	NA	NA	780000	20000000
4-NITROTOLUENE	99-99-0	1/15	210	J	210	J	210	110	87.2	250	IS11SS400001	Undefined	210	210	NA	NA	780000	20000000
Pesticides/PCBs (ug/kg)																		
4,4'-DDE	72-55-9	11/40	0.23	J	10	J	1.7	1.4	1.4	4.2	BGDSS0080101	Undefined	10	10	NA	NA	1900	17000
4,4'-DDT	50-29-3	7/39	0.38	J	9.4	J	2.3	2.0	1.8	5.7	BGDSS0080101	Undefined	9.4	9.4	NA	NA	1900	17000
Inorganics (mg/kg)																		
ALUMINUM	7429-90-5	58/58	2010		25300		9750	9750	NA	NA	BGDSB0030101	Lognormal	11500	27400	7000 - > 100000	NA	78000	2000000
ANTIMONY	7440-36-0	3/61	0.68	J	1.8	J	1.4	0.51	0.174	2.15	BGDSB0030101	Undefined	1.8	1.8	<1 - 8.8	NA	31	820
ARSENIC	7440-38-2	54/62	0.78		**18.3**		5.1	4.6	0.76	4.5	BGDSS0190101	Undefined	18.3	18.3	<0.1 - 73	**1.1 - 7.1**	**0.43**	**3.8**
BARIUM	7440-39-3	62/62	9.07		101		41.4	41.4	NA	NA	BGDSB0030101	Undefined	101	101	10 - 1500	150 - 700	5500	140000
BERYLLIUM	7440-41-7	48/62	0.05	J	1.1	L	0.45	0.36	0.047	0.53	BGDSB0030101	Undefined	1.1	1.1	<1 -7	ND - 3	160	4100
CADMIUM	7440-43-9	20/62	0.095		2.5		0.31	0.16	0.06	0.59	IS25SS190001	Lognormal	0.18	0.56	NA	<0.01 - 5.6	78	2000
CALCIUM	7440-70-2	37/58	50.7		2420		415	287	49.6	275	IS13SS100001	Undefined	2420	2420	100 - 280000	NA	NA	NA
CHROMIUM	7440-47-3	62/62	3.5	K	46.5	J	17.3	17.3	NA	NA	BGDSB0150101	Undefined	46.5	46.5	1 - 1000	15 - 100	230	6100
COBALT	7440-48-4	62/62	0.58		**133**		6.8	6.8	NA	NA	BGDSB0030101	Undefined	133	133	**<0.3 - 70**	**ND -20**	1600	41000
COPPER	7440-50-8	58/62	1.6		25.9		8.1	7.7	1.53	4.6	BGDSB0150101	Undefined	25.9	25.9	<1 - 700	5 - 70	3100	82000
CYANIDE	57-12-5	7/16	0.59		0.73		0.64	0.53	0.073	2.5	IS21SS190001	Undefined	0.73	0.73	NA	NA	1600	41000
IRON	7439-89-6	58/58	2770		**61600**	J	18000	18000	NA	NA	BGDSB0150101	Lognormal	21700	57200	100 - > 100000	NA	**23000**	610000
LEAD	7439-92-1	57/62	3.1		**149**		15.4	14.7	5.3	28.8	BGDSS0080101	Undefined	149	149	<10 - 300	**10 - 50**	400[4]	750[4]
MAGNESIUM	7439-95-4	58/58	143	K	1990		704	704	NA	NA	BGDSB0030101	Lognormal	809	1820	50 - 50000	NA	NA	NA
MANGANESE	7439-96-5	58/58	15.9	J	1270	J	187	187	NA	NA	BGDSB0030101	Lognormal	266	952	<2 - 7000	NA	1600	41000
MERCURY	7439-97-6	40/62	0.01		**0.18**	L	0.059	0.047	0.02	0.077	IS11SB250203	Lognormal	0.06	0.15	0.01 - 3.4	**0.04 - 0.14**	23	610
NICKEL	7440-02-0	62/62	1.005		18.2	L	5.8	5.8	NA	NA	BGDSB0030101	Undefined	18.2	18.2	<5 - 700	ND - 30	1600	41000
POTASSIUM	09/07/40	58/58	128		2845	J	617	617	NA	NA	BGDSB0060101-AVG	Undefined	2845	2845	50 - 37000	NA	NA	NA
SELENIUM	7782-49-2	27/62	0.168	L	**2.7**	L	0.94	0.64	0.153	1.9	BGDSB0190101	Lognormal	0.82	2.4	<0.1 - 3.9	**<0.1 - 0.5**	390	10000
SILVER	7440-22-4	18/62	0.27	L	2.25	J	0.78	0.33	0.06	0.92	BGDSB0160101-AVG	Undefined	2.2	2.2	NA	NA	390	10000
SODIUM	7440-23-5	31/58	38.5		232		79.8	69.9	18.4	447	BGDSB0060101-AVG	Undefined	232	232	<500 - 50000	NA	NA	NA
THALLIUM	7440-28-0	17/62	0.48		**6.05**	L	1.9	0.79	0.22	3	BGDSB0160101-AVG	Undefined	6.0	6.0	NA	NA	**5.5**	140
VANADIUM	7440-62-2	62/62	9.78	L	127		29.3	29.3	NA	NA	BGDSB0150101	Undefined	127	127	<7 - 300	20 - 150	550	14000
ZINC	7440-66-6	62/62	6.2		70.4		21.1	21.1	NA	NA	BGDSB0030101	Undefined	70.4	70.4	<5 - 2900	8 - 113	23000	610000
Miscellaneous (mg/kg)																		
AMMONIA	7664-41-7	4/4	7.8		49.9		22.3	22.3	NA	NA	S26-MW03-001	Lognormal	49.9	49.9	NA	NA	NA	NA
DIESEL RANGE ORGANICS	TTNUS004	4/9	4.3		47		18.4	9.2	3.5	4.1	IS11SS400001	Undefined	47.0	47.0	NA	NA	NA	NA
NITRITE/NITRATE	TTNUS029	1/4	1.9		1.9		1.9	1.2	1.5	2.6	S25-MW03-001	Lognormal	1.9	1.9	NA	NA	NA	NA
PH (S.U.)	TTNUS002	7/7	4.5		7		5.3	5.3	NA	NA	IS13SS100001	Lognormal	6.0	7.0	NA	NA	NA	NA
TOTAL ORGANIC CARBON	TTNUS003	50/51	261		40100		7640	7490	87.5	87.5	IS11SS420001	Undefined	40100	40100	NA	NA	NA	NA
TOTAL ORGANIC HALIDES	TTNUS043	1/20	55.2		55.2		55.2	24.7	35.9	57.1	BGDSB0040101	Undefined	55.2	55.2	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBONS	TTNUS001	2/2	33.7	L	39.1	L	36.4	36.4	NA	NA	S26-MW03-002	Undefined	39.1	39.1	NA	NA	NA	NA
TOTAL SOLIDS (%)	TTNUS046	7/7	66		79.2		75.4	75.4	NA	NA	IS25SS180001	Undefined	79.2	79.2	NA	NA	NA	NA

1 - Shacklette, H. T. and J. G. Boerngen (1984) (surface soil values are presented in table)
2 - Dragun, J. (1991) (surface soil values are presented in table)
3 - EPA Region III Risk-Based Concentrations, October, 2002.
4 - EPA Region 9 PRGs Table, October, 2002.
5 - Pyrene is used as a surrogate for Benzo(g,h,i)perylene, and Phenanthrene.
Bolded values represent exceedances of Region III RBC's or background concentrations reported in literature background references
NA - Not available
J Positive detection is qualified as an estimate.
K Positive detection is qualified as biased high.
L Positive result is qualified as biased low.

TABLE 4-2

SUMMARY OF DESCRIPTIVE STATISTICS FOR SURFACE SOILS
BACKGROUND INVESTIGATION REPORT FOR SOILS
INDIAN HEAD DIVISION
NSWC INDIAN HEAD, MARYLAND

Chemical	Cas Number	Frequency of Detection	Minimum Detection	Minimum Qualifier	Maximum Detection	Maximum Qualifier	Average of Positive Detections	Average of All Detections	Minimum Nondetect	Maximum Nondetect	Location of Maximum	Distribution of Data	95% Upper onfidence Lim	95% Upper Tolerance Limit	Eastern U.S. Soils [1]	Maryland Soils [2]	Residential Risk-Based Concentration [3]	Industrial Risk-Based Concentration [3]
Volatile Organic Compounds (ug/kg)																		
ACETONE	67-64-1	2/23	2200		13000	L	7600	660	1.9	23	RN6SS0170101	UNDEFINED	13000	13000	NA	NA	7800000	200000000
CYCLOHEXANE	110-82-7	1/14	3.6	J	3.6	J	3.6	5.3	5.4	15	IS11SS420001	UNDEFINED	3.6	3.6	NA	NA	NA	NA
ETHYLBENZENE	100-41-4	1/23	2.4	J	2.4	J	2.4	5.0	1.5	15	IS11SS400001	UNDEFINED	2.4	2.4	NA	NA	7800000	200000000
GASOLINE RANGE ORGANICS	TTNUS005	2/5	0.1225		0.17		0.15	15	0.13	150	IS11SS420001	UNDEFINED	0.17	0.17	NA	NA	NA	NA
METHYL ACETATE	79-20-9	1/14	2.3	J	2.3	J	2.3	5.3	5.4	15	IS11SS390001	UNDEFINED	2.3	2.3	NA	NA	78000000	2000000000
STYRENE	100-42-5	1/23	1.3	J	1.3	J	1.3	5.2	0.34	15	BGDSS0120101-AVG	UNDEFINED	1.3	1.3	NA	NA	16000000	410000000
TOLUENE	108-88-3	3/23	32.5		140	J	81	15	1.9	15	IS11SS400001	UNDEFINED	140	140	NA	NA	16000000	410000000
TOTAL XYLENES	1330-20-7	3/15	1.7	J	9.9	J	5.6	6.4	0.78	17	IS11SS420001	UNDEFINED	9.9	9.9	NA	NA	160000000	4100000000
TRICHLOROFLUOROMETHANE	75-69-4	3/23	1.7	J	2.5	J	2.1	5.2	0.33	15	BGDSS0200101	UNDEFINED	2.5	2.5	NA	NA	23000000	610000000
Semivolatile Organic Compounds (ug/kg)																		
2-METHYLNAPHTHALENE	91-57-6	1/23	73	L	73	L	73	140	42	490	IS21SS200001	UNDEFINED	73	73	NA	NA	1600000	41000000
ACENAPHTHENE	83-32-9	1/23	140		140		140	160	38.7	490	BGDSS0160101	UNDEFINED	140	140	NA	NA	4700000	120000000
ACETOPHENONE	98-86-2	3/23	46	J	64	J	58	140	52	490	IS11SS400001	UNDEFINED	64	64	NA	NA	7800000	200000000
ANTHRACENE	120-12-7	1/23	260		260		260	160	26.2	490	BGDSS0160101	UNDEFINED	260	260	NA	NA	23000000	610000000
BENZALDEHYDE	100-52-7	1/20	59	J	59	J	59	160	130	490	IS25SS190001	UNDEFINED	59	59	NA	NA	7800000	200000000
BENZO(A)ANTHRACENE	56-55-3	1/23	480		480		480	170	13.6	490	BGDSS0160101	UNDEFINED	480	480	NA	NA	870	7800
BENZO(A)PYRENE	50-32-8	1/23	390		**390**		390	170	16.9	490	BGDSS0160101	UNDEFINED	390	390	NA	NA	**87**	780
BENZO(B)FLUORANTHENE	205-99-2	1/23	420		420		420	170	35	490	BGDSS0160101	UNDEFINED	420	420	NA	NA	870	7800
BENZO(G,H,I)PERYLENE[5]	191-24-2	1/23	130		130		130	160	45	490	BGDSS0160101	UNDEFINED	130	130	NA	NA	2300000	61000000
BENZO(K)FLUORANTHENE	207-08-9	1/23	360	J	360	J	360	170	41.6	490	BGDSS0160101	UNDEFINED	360	360	NA	NA	8700	78000
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	8/23	51	J	7500	J	1100	470	58	490	BGDSS0200101	UNDEFINED	7500	7500	NA	NA	46000	410000
CARBAZOLE	86-74-8	1/20	130	J	130	J	130	160	35	490	BGDSS0160101	UNDEFINED	130	130	NA	NA	32000	290000
CHRYSENE	218-01-9	1/23	440		440		440	170	21	490	BGDSS0160101	UNDEFINED	440	440	NA	NA	87000	780000
DIBENZOFURAN	132-64-9	1/23	65	J	65	J	65	150	28.7	490	BGDSS0160101	UNDEFINED	65	65	NA	NA	310000	8200000
FLUORANTHENE	206-44-0	2/23	65	J	1100		580	190	35	490	BGDSS0160101	UNDEFINED	1100	1100	NA	NA	3100000	82000000
FLUORENE	86-73-7	1/23	150		150		150	160	27.1	490	BGDSS0160101	UNDEFINED	150	150	NA	NA	3100000	82000000
INDENO(1,2,3-CD)PYRENE	193-39-5	1/23	100		100		100	160	46.4	490	BGDSS0160101	UNDEFINED	100	100	NA	NA	870	7800
NAPHTHALENE	91-20-3	1/23	110	L	110	L	110	150	34.5	490	IS21SS200001	UNDEFINED	110	110	NA	NA	1600000	41000000
PHENANTHRENE[5]	85-01-8	1/23	1100		1100		1100	200	35	490	BGDSS0160101	UNDEFINED	1100	1100	NA	NA	2300000	61000000
PYRENE	129-00-0	2/23	120	J	880		500	180	35	490	BGDSS0160101	UNDEFINED	880	880	NA	NA	2300000	61000000
Explosives (ug/kg)																		
2-NITROTOLUENE	88-72-2	1/9	150	J	150	J	150	110	81.4	250	IS11SS400001	UNDEFINED	150	150	NA	NA	780000	20000000
4-NITROTOLUENE	99-99-0	1/9	210	J	210	J	210	120	87.2	250	IS11SS400001	UNDEFINED	210	210	NA	NA	780000	20000000
Pesticides/PCBs (ug/kg)																		
4,4'-DDE	72-55-9	6/20	0.23	J	10	J	2.2	1.6	1.4	4.1	BGDSS0080101	UNDEFINED	10	10	NA	NA	1900	17000
4,4'-DDT	50-29-3	4/19	0.38	J	9.4	J	3.1	2.2	2.225	4.6	BGDSS0080101	UNDEFINED	9.4	9.4	NA	NA	1900	17000
Inorganics (mg/kg)																		
ALUMINUM	7429-90-5	32/32	2010		15500	J	7540	7540	NA	NA	BGDSS0150101	LOGNORMAL	9000	19700	7000 - > 100000	NA	78000	2000000
ARSENIC	7440-38-2	30/34	0.78		**18.3**		4.3	4.0	1.6	3.8	BGDSS0190101	LOGNORMAL	5.2	14.9	<0.1 - 73	**1.1 - 7.1**	**0.43**	**3.8**
BARIUM	7440-39-3	34/34	12.5		84.8		42.5	42.5	NA	NA	S26-MW03-001	NORMAL	47.6	80.4	10 - 1500	150 - 700	5500	140000
BERYLLIUM	7440-41-7	24/34	0.05	J	1.1		0.44	0.33	0.047	0.53	BGDSS0120101-AVG	UNDEFINED	1.1	1.1	<1 -7	ND - 3	160	4100
CADMIUM	7440-43-9	12/34	0.12	J	2.5		0.4	0.2	0.06	0.57	IS25SS190001	UNDEFINED	2.5	2.5	NA	<0.01 - 5.6	78	2000
CALCIUM	7440-70-2	22/32	83.9	J	2420		504	369	98.8	275	IS13SS100001	LOGNORMAL	573	2060	100 - 280000	NA	NA	NA
CHROMIUM	7440-47-3	34/34	3.5	K	28.9	L	13.6	13.6	NA	NA	IS13SS100001	LOGNORMAL	15.9	33.4	1 - 1000	15 - 100	230	6100
COBALT	7440-48-4	34/34	0.58		15		5.4	5.4	NA	NA	S26-MW03-001	LOGNORMAL	7.5	22.3	<0.3 - 70	ND -20	1600	41000
COPPER	7440-50-8	32/34	1.8		19.4		6.7	6.5	4.5	4.6	BGDSS0120101-AVG	LOGNORMAL	8.0	20.3	<1 - 700	5 - 70	3100	82000
CYANIDE	57-12-5	4/10	0.59		0.73		0.66	0.42	0.073	1.1	IS21SS190001	UNDEFINED	0.73	0.73	NA	NA	1600	41000
IRON	7439-89-6	32/32	2770		**31800**	J	13000	13000	NA	NA	BGDSS0120101-AVG	LOGNORMAL	16000	38500	100 - > 100000	NA	**23000**	610000
LEAD	7439-92-1	32/34	3.5	J	**149**		18.7	17.9	9.4	10	BGDSS0080101	LOGNORMAL	21.7	62.5	<10 - 300	**10 - 50**	400[4]	750[4]
MAGNESIUM	7439-95-4	32/32	143	K	1990		604	604	NA	NA	IS13SS100001	LOGNORMAL	722	1620	50 - 50000	NA	NA	NA
MANGANESE	7439-96-5	32/32	17.4		882	J	227	227	NA	NA	S26-MW03-001	LOGNORMAL	388	1390	<2 - 7000	NA	1600	41000
MERCURY	7439-97-6	23/34	0.03		0.13	L	0.06	0.05	0.02	0.077	BGDSS0150101	LOGNORMAL	0.060	0.16	0.01 - 3.4	0.04 - 0.14	23	610
NICKEL	7440-02-0	34/34	1.7		14		5.4	5.4	NA	NA	IS11SS410001-AVG	LOGNORMAL	6.6	15.4	<5 - 700	ND - 30	1600	41000
POTASSIUM	09/07/40	32/32	128		2620		497	497	NA	NA	IS13SS100001	LOGNORMAL	597	1470	50 - 37000	NA	NA	NA
SELENIUM	7782-49-2	14/34	0.168	L	**1.2**		0.67	0.54	0.16	1.9	IS11SS400001	NORMAL	0.62	1.2	<0.1 - 3.9	**<0.1 - 0.5**	390	10000
SILVER	7440-22-4	9/34	0.27	L	0.84		0.6	0.29	0.06	0.92	IS11SS400001	UNDEFINED	0.84	0.84	NA	NA	390	10000
SODIUM	7440-23-5	15/32	38.5		120		64.2	65.6	19.2	407	IS11SS400001	UNDEFINED	120	120	<500 - 50000	NA	NA	NA
THALLIUM	7440-28-0	7/34	1.2		2.3	L	1.5	0.62	0.22	3	BGDSS0160101	UNDEFINED	2.3	2.3	NA	NA	5.5	140
VANADIUM	7440-62-2	34/34	9.83	L	63.7		23.3	23.3	NA	NA	BGDSS0150101	LOGNORMAL	26.7	53.3	<7 - 300	20 - 150	550	14000
ZINC	7440-66-6	34/34	6.2		42.95	J	20.2	20.2	NA	NA	BGDSS0120101-AVG	NORMAL	23.6	37.5	<5 - 2900	8 - 113	23000	610000
Miscellaneous (mg/kg)																		
AMMONIA	7664-41-7	2/2	21.9		49.9		35.9	35.9	NA	NA	S26-MW03-001	UNDEFINED	---	---	NA	NA	NA	NA
DIESEL RANGE ORGANICS	TTNUS004	4/5	4.3		47		18.4	15.1	4	4	IS11SS400001	LOGNORMAL	47.0	1350	NA	NA	NA	NA
NITRITE/NITRATE	TTNUS029	1/2	1.9		1.9		1.9	1.3	1.5	1.5	S25-MW03-001	UNDEFINED	---	---	NA	NA	NA	NA
PH (S.U.)	TTNUS002	7/7	4.5		7		5.3	5.3	NA	NA	IS13SS100001	LOGNORMAL	6.0	8.8	NA	NA	NA	NA
TOTAL ORGANIC CARBON	TTNUS003	29/29	1410	J	40100		10900	10900	NA	NA	IS11SS420001	LOGNORMAL	16800	57200	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBONS	TTNUS001	1/1	33.7	L	33.7	L	33.7	33.7	NA	NA	S26-MW03-001	UNDEFINED	---	---	NA	NA	NA	NA
TOTAL SOLIDS (%)	TTNUS046	7/7	66		79.2		75.4	75.4	NA	NA	IS25SS180001	UNDEFINED	79.2	79.2	NA	NA	NA	NA

1 - Shacklette, Hansford T. and Josephine G. Boerngen, Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States, U.S. Geological Survey Professional Paper 1270, 1984
(surface soil values are presented in table)
2 - Dragun, James, Ph.D., Elements in North American Soils. HMCRI, Green Belt, MD, 1991 (surface soil values are presented in table)
3 - EPA Region III Risk-Based Concentrations, October, 2002.
4 - EPA Regon 9 PRGs Table, October, 2002.
5 - Pyrene is used as a surrogate for Benzo(g,h,i)perylene, and Phenanthrene.
Bolded values represent exceedances of Region III RBC's or background concentrations reported in literature background references
NA - Not available
J Positive detection is qualified as an estimate.
K Positive detection is qualified as biased high.
L Positive result is qualified as biased low.
--- Upper confidence and tolerance limits cannot be calculated because of the size of the data set.
NA - Not available

TABLE 4-3

SUMMARY OF DESCRIPTIVE STATISTICS FOR CLAY-LIKE SUBSURFACE SOILS
BACKGROUND INVESTIGATION REPORT FOR SOILS
INDIAN HEAD DIVISION
NSWC INDIAN HEAD, MARYLAND

Chemical	Cas Number	Frequency of Detection	Minimum Detection	Minimum Qualifier	Maximum Detection	Maximum Qualifier	Average of Positive Detections	Average of All Detections	Minimum Nondetect	Maximum Nondetect	Location of Maximum	Distribution of Data	95% Upper Confidence Limit	95% Upper Tolerance Limit	Eastern U.S. Soils [1]	Maryland Soils [2]	Residential Risk-Based Concentration [3]	Industrial Risk-Based Concentration [3]
Volatile Organic Compounds (ug/kg)																		
TOTAL XYLENES	1330-20-7	1/4	2.4	J	2.4	J	2.4	4.7	0.82	18	IS11SB260203	NORMAL	9.4	25	NA	NA	160000000	4100000000
TRICHLOROFLUOROMETHANE	75-69-4	2/7	2.5	J	2.7	J	2.6	4.4	0.35	14	BGDSB0110101	NORMAL	6.3	13	NA	NA	23000000	610000000
Semivolatile Organic Compounds (ug/kg)																		
1,3-DINITROBENZENE	99-65-0	1/3	32	J	32	J	32	120	250	393	IS11SB260203	NORMAL	260	750	NA	NA	7800	200000
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	3/7	77	J	120	J	94	110	76.8	450	BGDSB0160101-AVG	LOGNORMAL	120	980	NA	NA	46000	410000
Pesticides/PCBs (ug/kg)																		
4,4'-DDE	72-55-9	1/8	0.68	J	0.68	J	0.68	1.2	1.5	4.2	BGDSB0150101	UNDEFINED	0.68	0.68	NA	NA	1900	17000
4,4'-DDT	50-29-3	1/8	0.79	J	0.79	J	0.79	2.1	3.8	5.7	BGDSB0150101	NORMAL	2.5	3.9	NA	NA	1900	17000
Inorganics (mg/kg)																		
ALUMINUM	7429-90-5	11/11	6840	J	25300		16800	16800	NA	NA	BGDSB0030101	NORMAL	20400	35400	7000 - > 100000	NA	78000	2000000
ANTIMONY	7440-36-0	3/11	0.68	J	1.8	J	1.4	0.78	0.21	2.1	BGDSB0030101	UNDEFINED	1.8	1.8	<1 - 8.8	NA	31	820
ARSENIC	7440-38-2	10/11	1.9	J	**14.15**		8.1	7.6	4.5	4.5	BGDSB0160101-AVG	NORMAL	9.8	18.9	<0.1 - 73	**1.1 - 7.1**	**0.43**	**3.8**
BARIUM	7440-39-3	11/11	34.7	J	101		55.0	55.0	NA	NA	BGDSB0030101	LOGNORMAL	68.0	134	10 - 1500	150 - 700	5500	140000
BERYLLIUM	7440-41-7	9/11	0.23	J	1.1	L	0.57	0.49	0.18	0.36	BGDSB0030101	LOGNORMAL	0.96	3.3	<1 -7	ND - 3	160	4100
CADMIUM	7440-43-9	1/11	0.14	J	0.14	J	0.14	0.11	0.07	0.59	IS11SB250203	LOGNORMAL	0.14	0.61	NA	<0.01 - 5.6	78	2000
CALCIUM	7440-70-2	6/11	50.7		479	J	308	190	49.6	134	BGDSB0110101	LOGNORMAL	479	2590	100 - 280000	NA	NA	NA
CHROMIUM	7440-47-3	11/11	13.4		46.5	J	27.6	27.6	NA	NA	BGDSB0150101	NORMAL	33.9	60.1	1 - 1000	15 - 100	230	6100
COBALT[5]	7440-48-4	11/11	1.5	K	**133**		16.8	16.8	NA	NA	BGDSB0030101	UNDEFINED	133	133	**<0.3 - 70**	**ND -20**	1600	41000
COPPER	7440-50-8	11/11	5.2	L	25.9		12.0	12.0	NA	NA	BGDSB0150101	LOGNORMAL	17.9	48.6	<1 - 700	5 - 70	3100	82000
CYANIDE	57-12-5	1/3	0.68		0.68		0.68	0.84	1.2	2.5	IS11SB250203	LOGNORMAL	0.68	16.1	NA	NA	1600	41000
IRON	7439-89-6	11/11	13800	J	**61600**	J	36400	36400	NA	NA	BGDSB0150101	NORMAL	45400	83100	100 - > 100000	NA	**23000**	610000
LEAD	7439-92-1	9/11	5.4	J	27.9		13.4	12.9	12.7	28.8	BGDSB0150101	LOGNORMAL	17.4	40.5	<10 - 300	10 - 50	400[4]	750[4]
MAGNESIUM	7439-95-4	11/11	498	J	1990		943	943	NA	NA	BGDSB0030101	LOGNORMAL	1220	2640	50 - 50000	NA	NA	NA
MANGANESE	7439-96-5	11/11	15.9	J	1270	J	242	242	NA	NA	BGDSB0030101	LOGNORMAL	1150	4130	<2 - 7000	NA	1600	41000
MERCURY	7439-97-6	6/11	0.03	K	**0.18**	L	0.09	0.06	0.04	0.063	IS11SB250203	UNDEFINED	0.18	0.18	0.01 - 3.4	**0.04 - 0.14**	23	610
NICKEL	7440-02-0	11/11	1.005		18.2	L	7.8	7.8	NA	NA	BGDSB0030101	UNDEFINED	18.2	18.2	<5 - 700	ND - 30	1600	41000
POTASSIUM	09/07/40	11/11	385		1610		756	756	NA	NA	BGDSB0030101	LOGNORMAL	1050	2610	50 - 37000	NA	NA	NA
SELENIUM	7782-49-2	4/11	1.2		**2.6**		2.0	1.0	0.18	1.75	BGDSB0040101	LOGNORMAL	2.6	13.3	<0.1 - 3.9	**<0.1 - 0.5**	390	10000
SILVER[6]	7440-22-4	4/11	0.66	J	2.25	J	1.1	0.5	0.09	0.78	BGDSB0160101-AVG	LOGNORMAL	2.2	11.4	NA	NA	390	10000
SODIUM	7440-23-5	7/11	62.1		131	L	99.2	90.7	21.4	447	BGDSB0030101	NORMAL	123	258	<500 - 50000	NA	NA	NA
THALLIUM[7]	7440-28-0	5/11	0.85	L	**6.05**	L	2.9	1.6	0.3	2.2	BGDSB0160101-AVG	LOGNORMAL	5.5	21.8	NA	NA	**5.5**	140
VANADIUM	7440-62-2	11/11	23.9		127		50.1	50.1	NA	NA	BGDSB0150101	LOGNORMAL	72.7	194	<7 - 300	20 - 150	550	14000
ZINC	7440-66-6	11/11	18.4	J	70.4		29.5	29.5	NA	NA	BGDSB0030101	UNDEFINED	70.4	70.4	<5 - 2900	8 - 113	23000	610000
Miscellaneous (mg/kg)																		
AMMONIA	7664-41-7	1/1	9.5		9.5		9.5	9.5	NA	NA	S26-MW03-002	UNDEFINED	9.5	9.5	NA	NA	NA	NA
TOTAL ORGANIC CARBON	TTNUS003	9/9	261		8300		3420	3420	NA	NA	BGDSB0110101	LOGNORMAL	8300	66500	NA	NA	NA	NA
TOTAL ORGANIC HALIDES	TTNUS043	1/4	55.2		55.2		55.2	32.3	39.8	57.1	BGDSB0040101	LOGNORMAL	55.2	281	NA	NA	NA	NA
TOTAL PETROLEUM HYDROCARBONS	TTNUS001	1/1	39.1	L	39.1	L	39.1	39.1	NA	NA	S26-MW03-002	UNDEFINED	39.1	39.1	NA	NA	NA	NA

1 - Shacklette, Hansford T. and Josephine G. Boerngen, Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States, U.S. Geological Survey Professional Paper 1270, 1984
(surface soil values are presented in table)
2 - Dragun, James, Ph.D., Elements in North American Soils. HMCRI, Green Belt, MD, 1991 (surface soil values are presented in table)
3 - EPA Region III Risk-Based Concentrations, October, 2002.
4 - EPA Region 9 PRGs Table, October, 2002.
5 - The maximum detection for cobalt of 133 mg/kg is a statistical outlier according to the Discordance Test. Upon removal of this result, the data set has a lognormal distribution, a 95% UCL of 9.82 mg/kg, and a 95% UTL of 33.4 mg/kg.
6 - The maximum detection for silver of 2.25 mg/kg is a statistical outlier according to the Discordance Test. Upon removal of this result, the data set has a lognormal distribution, a 95% UCL of 1.22 mg/kg, and a 95% UTL of 4.76 mg/kg.
7 - The maximum detection for thallium of 6.05 mg/kg is a statistical outlier according to the Discordance Test. Upon removal of this result, the data set has a lognormal distribution, a 95% UCL of 3.16 mg/kg, and a 95% UTL of 11.0 mg/kg.
Bolded values represent exceedances of Region III RBC's or background concentrations reported in literature background references
NA - Not available
J Positive detection is qualified as an estimate.
K Positive detection is qualified as biased high.
L Positive result is qualified as biased low.
NA - Not available

TABLE 4-4

SUMMARY OF DESCRIPTIVE STATISTICS FOR NON-CLAY-LIKE SUBSURFACE SOILS
BACKGROUND INVESTIGATION REPORT FOR SOILS
INDIAN HEAD DIVISION
NSWC INDIAN HEAD, MARYLAND

Chemical	Cas Number	Frequency of Detection	Minimum Detection	Minimum Qualifier	Maximum Detection	Maximum Qualifier	Average of Positive Detections	Average of All Detections	Minimum Nondetect	Maximum Nondetect	Location of Maximum	Distribution of Data	95% Upper Confidence Limit	95% Upper Tolerance Limit	Eastern U.S. Soils [1]	Maryland Soils [2]	Residential Risk-Based Concentration [3]	Industrial Risk-Based Concentration [3]
Volatile Organic Compounds (ug/kg)																		
ACETONE	67-64-1	1/10	1800		1800		1800	180	2.6	13	RPLSB0030101	UNDEFINED	1800	1800	NA	NA	7800000	200000000
TOLUENE	108-88-3	1/10	3.3	J	3.3	J	3.3	4.2	5	13	IS11SB230203	UNDEFINED	3.3	3.3	NA	NA	16000000	410000000
TOTAL XYLENES	1330-20-7	1/5	9	J	9	J	9.0	8.0	12	17	IS11SB240203	NORMAL	9.1	13	NA	NA	160000000	4100000000
TRICHLOROFLUOROMETHANE	75-69-4	2/10	1.8	J	2	J	1.9	4.5	5	13	BGDSB0200101	UNDEFINED	2.0	2.0	NA	NA	23000000	610000000
Semivolatile Organic Compounds (ug/kg)																		
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	3/10	57	J	79	J	69	110	75	390	BGDSB0190101	UNDEFINED	79	79	NA	NA	46000	410000
Pesticides/PCBs (ug/kg)																		
4,4'-DDE	72-55-9	4/12	0.24	J	2.9	J	1.1	1.2	1.4	3.9	BGDSB0080101	LOGNORMAL	2.3	7.7	NA	NA	1900	17000
4,4'-DDT	50-29-3	2/12	0.58	J	2.4	J	1.5	1.8	1.8	4.75	BGDSB0080101	UNDEFINED	2.4	2.4	NA	NA	1900	17000
Inorganics (mg/kg)																		
ALUMINUM	7429-90-5	15/15	3070	J	18900		9260	9260	NA	NA	BGDSB0010101	NORMAL	11400	21400	7000 - > 100000	NA	78000	2000000
ARSENIC	7440-38-2	14/17	1.8		**9.2**		4.5	3.8	0.76	1.9	BGDSB0120101	LOGNORMAL	7.9	28.7	<0.1 - 73	**1.1 - 7.1**	**0.43**	**3.8**
BARIUM	7440-39-3	17/17	9.07		56.2	J	30.5	30.5	NA	NA	BGDSB0080101	NORMAL	36.6	66.5	10 - 1500	150 - 700	5500	140000
BERYLLIUM	7440-41-7	15/17	0.12		0.91		0.37	0.34	0.14	0.25	BGDSB0120101	LOGNORMAL	0.51	1.5	<1 -7	ND - 3	160	4100
CADMIUM	7440-43-9	7/17	0.095		0.27	K	0.18	0.13	0.06	0.511	BGDSB0080101	LOGNORMAL	0.20	0.61	NA	<0.01 - 5.6	78	2000
CALCIUM	7440-70-2	9/15	75.4	J	785	J	270	186	81	249.5	BGDSB0140101	LOGNORMAL	353	1270	100 - 280000	NA	NA	NA
CHROMIUM	7440-47-3	17/17	6.2		44.7	J	18.0	18.0	NA	NA	BGDSB0060101-AVG	LOGNORMAL	23.7	59.1	1 - 1000	15 - 100	230	6100
COBALT	7440-48-4	17/17	0.845	L	7.2		3.2	3.2	NA	NA	BGDSB0120101	LOGNORMAL	4.9	14.7	<0.3 - 70	ND -20	1600	41000
COPPER	7440-50-8	15/17	1.6		23.1		8.3	7.5	1.53	4.5	BGDSB0120101	LOGNORMAL	13.8	47.6	<1 - 700	5 - 70	3100	82000
CYANIDE	57-12-5	2/3	0.59		0.59		0.59	0.56	1.02	1.02	IS11SB240203	UNDEFINED	0.59	0.59	NA	NA	1600	41000
IRON	7439-89-6	15/15	4030	J	**31700**	J	15200	15200	NA	NA	BGDSB0140101	NORMAL	18800	35200	100 - > 100000	NA	**23000**	610000
LEAD	7439-92-1	16/17	3.1		25.5		9.8	9.3	5.3	5.3	BGDSB0080101	LOGNORMAL	13.5	38.6	<10 - 300	10 - 50	400[4]	750[4]
MAGNESIUM	7439-95-4	15/15	215	J	1720	J	741	741	NA	NA	BGDSB0120101	LOGNORMAL	1070	2940	50 - 50000	NA	NA	NA
MANGANESE	7439-96-5	15/15	16.2	J	120		62.2	62.2	NA	NA	IS11SB230203	NORMAL	78.7	155	<2 - 7000	NA	1600	41000
MERCURY	7439-97-6	11/17	0.01		0.08	L	0.04	0.03	0.03	0.059	BGDSB0140101	LOGNORMAL	0.048	0.14	0.01 - 3.4	0.04 - 0.14	23	610
NICKEL	7440-02-0	17/17	1.8		13.2		5.4	5.4	NA	NA	BGDSB0120101	LOGNORMAL	6.9	15.9	<5 - 700	ND - 30	1600	41000
POTASSIUM	09/07/40	15/15	237		2845	J	770	770	NA	NA	BGDSB0060101-AVG	LOGNORMAL	1140	3440	50 - 37000	NA	NA	NA
SELENIUM	7782-49-2	9/17	0.295	L	**2.7**	L	0.9	0.59	0.153	1	BGDSB0190101	LOGNORMAL	1.1	3.8	<0.1 - 3.9	**<0.1 - 0.5**	390	10000
SILVER	7440-22-4	5/17	0.63		1.1	J	0.79	0.29	0.06	0.4	BGDSB0190101	UNDEFINED	1.1	1.1	NA	NA	390	10000
SODIUM	7440-23-5	9/15	44.5		232.5		90.9	63.9	18.4	80.5	BGDSB0060101-AVG	LOGNORMAL	128	461	<500 - 50000	NA	NA	NA
THALLIUM	7440-28-0	5/17	0.48		2.8	L	1.3	0.57	0.225	1.2	BGDSB0190101	LOGNORMAL	1.1	4.1	NA	NA	5.5	140
VANADIUM	7440-62-2	17/17	9.78	L	61.9		27.9	27.9	NA	NA	BGDSB0140101	LOGNORMAL	38.8	102	<7 - 300	20 - 150	550	14000
ZINC	7440-66-6	17/17	7.3	J	45.9	J	17.6	17.6	NA	NA	BGDSB0120101	LOGNORMAL	22.2	49.7	<5 - 2900	8 - 113	23000	610000
Miscellaneous (mg/kg)																		
AMMONIA	7664-41-7	1/1	7.8		7.8		7.8	7.8	NA	NA	S25-MW03-002	UNDEFINED	7.8	7.8	NA	NA	NA	NA
TOTAL ORGANIC CARBON	TTNUS003	12/13	354	J	8200		2880	2660	87.5	87.5	BGDSB0190101	LOGNORMAL	17900	64300	NA	NA	NA	NA

1 - Shacklette, Hansford T. and Josephine G. Boerngen, Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States, U.S. Geological Survey Professional Paper 1270, 1984
(surface soil values are presented in table)
2 - Dragun, James, Ph.D., Elements in North American Soils. HMCRI, Green Belt, MD, 1991 (surface soil values are presented in table)
3 - EPA Region III Risk-Based Concentrations, October, 2002.
4 - EPA Region 9 PRGs Table, October, 2002.
Bolded values represent exceedances of Region III RBC's or background concentrations reported in literature background references
NA - Not available
J Positive detection is qualified as an estimate.
K Positive detection is qualified as biased high.
L Positive result is qualified as biased low.
NA - Not available

SAP Worksheet #15B - Soil Reference Limits and Evaluation Background Table

CAS Number	Chemical	ORNL Risk-Based Concentration[1]		MDE Generic Numeric Cleanup Standards[2]		Ecological Criteria			
		Residential (mg/kg)		Residential (mg/kg)	Soil to Groundwater (mg/kg)	USEPA Eco-SSL (mg/kg)[4]	USEPA Region 3 BTAG (mg/kg)[5]	ORNL Plant (mg/kg)[6]	ORNL Invertebrate (mg/kg)[7]
Volatile Organic Compounds									
71-43-2	Benzene	0.11	C	12	0.005	NA	0.1	NC	NC
75-15-0	Carbon Disulfide	67	N	780	19	NA	NA	NA	NA
67-66-3	Chloroform	0.03	C	100	0.005	NA	0.3	NC	NC
60-29-7	Ethyl Ether	1600	N	1600	NA	NA	NA	NA	NA
75-09-2	Methylene chloride	1.1	C	85	0.019	NA	0.3	NC	NC
108-88-3	Toluene	500	N	1600	8.8	NA	0.1	NC	NC
Explosives									
99-35-4	1,3,5-Trinitrobenzene	180	N	NA	NA	NA	NA	NA	NA
99-65-0	1,3-Dinitrobenzene	0.61	N	NA	NA	NA	NA	NA	NA
118-96-7	2,4,6-Trinitrotoluene (TNT)	1.6	C	NA	NA	NA	NA	NA	NA
121-14-2	2,4-Dinitrotoluene	12	N	16	1.7	NA	NA	NA	NA
606-20-2	2,6-Dinitrotoluene	6.1	N	7.8	1.7	NA	NA	NA	NA
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX	310	N	NA	NA	NA	NA	NA	NA
99-08-1	3-Nitrotoluene	NA		NA	NA	NA	NA	NA	NA
88-72-2	2-Nitrotoluene	78	N	NA	NA	NA	NA	NA	NA
99-99-0	4-Nitrotoluene	3	C	NA	NA	NA	NA	NA	NA
19406-51-0	4-Amino-2,6-Dinitrotoluene	12	N	NA	NA	NA	NA	NA	NA
35572-78-2	2-Amino-4,6-Dinitrotoluene	12	N	NA	NA	NA	NA	NA	NA
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	24	N	NA	NA	NA	NA	NA	NA
98-95-3	Nitrobenzene	3.1	N	NA	NA	NA	NA	NA	NC
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.44	C	NA	NA	NA	NA	NA	NA
55-63-0	Nitroglycerin	6.1	N	NA	NA	NA	NA	NA	NA
9004-70-0	Nitrocellulose	NA		NA	NA	NA	NA	NA	NA
556-88-7	Nitroguanidine	610	N	NA	NA	NA	NA	NA	NA
14797-73-0	Perchlorate	5.5	N	NA	NA	NA	NA	NA	NA
78-11-5	PETN	NA		NA	NA	NA	NA	NA	NA
618-87-1	3,5-Dinitroaniline	NA		NA	NA	NA	NA	NA	NA
Metals									
7429-90-5	Aluminum	7700	N	7800	NA	pH < 5.5[8]	NC	NC	NC
7440-36-0	Antimony	3.1	N	12	NA	0.27	NC	NC	NC
7440-38-2	Arsenic	0.039	C	2	NA	18	NC	NC	NC
7440-39-3	Barium	1500	N	550	NA	330	NC	NC	NC
7440-41-7	Beryllium	16	N	16	NA	21	NC	NC	NC
7440-43-9	Cadmium	7	N	3.9	NA	0.36	NC	NC	NC
7440-70-2	Calcium	NA		NA	NA	NA	NA	NA	NA
7440-47-3	Chromium	12000	N	23	NA	26	NC	NC	NC
7440-48-4	Cobalt	NA		160	NA	160	NC	NC	NC
7440-50-8	Copper	310	N	310	NA	310	NC	NC	NC
7439-89-6	Iron	5500	N	2300	NA	pH<5 or >8[9]	NC	NC	NC
7439-93-2	Lithium	NA		NA	NA	NA	NA	2	NA
7439-92-1	Lead	40	N	400	NA	11	NC	NC	NC
7439-95-4	Magnesium	NA		NA	NA	NA	4400	NC	NC
7439-96-5	Manganese	180	N	160	NA	220	NC	NC	NC

CAS Number	Chemical	Risk-Based Concentration[1]	Cleanup Standards[2]		Ecological Criteria			
		Residential (mg/kg)	Residential (mg/kg)	Soil to Groundwater (mg/kg)	USEPA Eco-SSL (mg/kg)[4]	USEPA Region 3 BTAG (mg/kg)[5]	ORNL Plant (mg/kg)[6]	ORNL Invertebrate (mg/kg)[7]
7439-97-6	Mercury	2.3 N[3]	100	NA	NA	0.058	NC	NC
7440-02-0	Nickel	160 N	160	NA	38	NC	NC	NC
7440-09-7	Potassium	NA	NA	NA	NA	NA	NA	NA
7782-49-2	Selenium	39 N	39	NA	0.52	NC	NC	NC
7440-22-4	Silver	39 N	39	NA	4.2	NC	NC	NC
7440-23-5	Sodium	NA	NA	NA	NA	NA	NA	NA
7440-24-6	Strontium	4700 N	NA	NA	NA	120	NC	NC
7440-28-0	Thallium	0.51 N	2	NA	NA	0.001	NC	NC
7440-31-5	Tin	4700 N	4700	NA	NA	0.89	NC	NC
7440-62-2	Vanadium	55 N	55	NA	7.8	NC	NC	NC
7440-66-6	Zinc	2300 N	2300	NA	46	NC	NC	NC
Miscellaneous Parameters								
	Total Petroleum Hydrocarbons				NA	NA	NA	NA

Notes
C - Carcinogenic
MDE - Maryland Department of the Environment
N - Noncarcinogenic
NC - Not Considered
RBC - Risk-Based Concentration
Eco-SSL - Ecological Soil Screening Level
BTAG - Biological Technical Advisory Group
ORNL - Oak Ridge National Lab

1 - USEPA Region 3 Risk-Based Concentration Table. The noncarcinogenic values (denoted with a "N" flag) are the RBC divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (ORNL RBC, July 2008).
2 - State of Maryland, Department of the Environment, Cleanup Standards for Soil and Groundwater, August 2001, Interim Final Guidance (Update No. 1).
3 - The value for mercuric chloride have been used as a surrogate for mercury.
4 - USEPA, 2005. Guidance for Developing Ecological Soil Screening Levels. Office of Solid Waste and Emergency and Response. OSWER Directive 92857-55. February. Directive 92857-55. February. Individual Eco-SSL documents available at http://www.epa.gov/ecotox/ecossl/.
5 - USEPA Region 3, BTAG Screening Levels, January 1995. These values are considered only if EPA SSLs are not available.
6 - Efroymson, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. Oak Ridge National Laboratory. November. ES/ER/TM-85/R3. These values are considered only if EPA Eco-SSLs and Region 3 BTAG values are not available.
7 - Efroymson, R.A., M.E. Will, and G.W. Suter II. 1997. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. Oak Ridge National Laboratory. November. ES/ER/TM-126/R2. These values are considered only if EPA Eco-SSLs, Region 3 BTAG, and ORNL Plant values are not available
8 - Aluminum is considered a COPC only when the soil pH is less than 5.5.
9 - Iron is not expected to be toxic to plants with a soil pH between 5 and 8.

SAP Worksheet #15B - Sediment Reference Limits and Evaluation Background Table

CAS Number	Chemical	ORNL RBC[1] (mg/kg)	Ecological Criteria		
			USEPA Region III BTAG (mg/kg)[4]	TEC (mg/kg)[5]	NOAA SQUIRTS (mg/kg)[6]
Volatile Organic Compounds					
71-43-2	Benzene	11 C	NA	NA	NA
75-15-0	Carbon Disulfide	6700 N	0.000851	NC	NC
67-66-3	Chloroform	3 C	NA	NA	NA
60-29-7	Ethyl Ether	160000 N	NA	NA	NA
75-09-2	Methylene chloride	110 C	NA	NA	NA
108-88-3	Toluene	50000 N	NA	NA	NA
Explosives					
99-35-4	1,3,5-Trinitrobenzene	18000 N	NA	NA	NA
99-65-0	1,3-Dinitrobenzene	61 N	NA	NA	NA
118-96-7	2,4,6-Trinitrotoluene	160 C	0.092	NC	NC
121-14-2	2,4-Dinitrotoluene	1200 N	0.0416	NC	NC
606-20-2	2,6-Dinitrotoluene	610 N	NA	NA	NA
2691-41-0	HMX	31000 N	NA	NA	NA
99-08-1	3-Nitrotoluene	NA	NA	NA	NA
88-72-2	2-Nitrotoluene	7800 N	NA	NA	NA
99-99-0	4-Nitrotoluene	300 C	4.06	NC	NC
19406-51-0	4-Amino-2,6-Dinitrotoluene	1200 N	NA	NA	NA
35572-78-2	2-Amino-4,6-Dinitrotoluene	1200 N	NA	NA	NA
479-45-8	Tetryl	2400 N	NA	NA	NA
98-95-3	Nitrobenzene	310 N	NA	NA	NA
121-82-4	RDX	44 C	0.013	NC	NC
55-63-0	Nitroglycerin	610 N	NA	NA	NA
9004-70-0	Nitrocellulose	NA	NA	NA	NA
556-88-7	Nitroguanidine	61000 N	NA	NA	NA
14797-73-0	Perchlorate	550 N	NA	NA	NA
78-11-5	PETN	NA	NA	NA	NA
618-87-1	3,5-Dinitroaniline	NA	NA	NA	NA
Metals					
7429-90-5	Aluminum	770000 N	NA	NA	NA
7440-36-0	Antimony	310 N	2	NC	NC
7440-38-2	Arsenic	3.9 C	9.8	NC	NC
7440-39-3	Barium	150000 N	NA	NA	NA
7440-41-7	Beryllium	1600 N	NA	NA	NA
7440-43-9	Cadmium	700 N	0.99	NC	NC
7440-70-2	Calcium	NA	NA	NA	NA

			Ecological Criteria		
CAS Number	**Chemical**	**ORNL RBC[1] (mg/kg)**	**USEPA Region III BTAG (mg/kg)[4]**	**TEC (mg/kg)[5]**	**NOAA SQUIRTS (mg/kg)[6]**
7440-47-3	Chromium (III)	1200000 N	43.4	NC	NC
7440-48-4	Cobalt	NA	50	NC	NC
7440-50-8	Copper	31000 N	31.6	NC	NC
7439-89-6	Iron	550000 N	20000	NC	NC
7439-93-2	Lithium	NA	NA	NA	NA
7439-92-1	Lead	4000 N	35.8	NC	NC
7439-95-4	Magnesium	NA	NA	NA	NA
7439-96-5	Manganese	18000 N	460	NC	NC
7439-97-6	Mercury	230 N[3]	0.18	NC	NC
7440-02-0	Nickel	16000 N	22.7	NC	NC
7440-09-7	Potassium	NA	NA	NA	NA
7782-49-2	Selenium	3900 N	2	NC	NC
7440-22-4	Silver	3900 N	1	NC	NC
7440-23-5	Sodium	NA	NA	NA	NA
7440-24-6	Strontium	470000 N	NA	NA	NA
7440-31-5	Tin	470000 N	NA	NA	NA
7440-62-2	Vanadium	5500 N	NA	NA	520
7440-66-6	Zinc	230000 N	121	NC	NC

Notes
C - Carcinogenic
N - Noncarcinogenic
NC - Not Considered
RBC - Risk-Based Concentration
TEC - Threshold Effects Concentration
BTAG - Biological Technical Advisory Group
NOAA - National Oceanic and Atmospheric Administration
ORNL - Oak Ridge National Laboratory

1 - ORNL Risk-Based Concentration Table (July 2008). The values have been multiplied by 10 for anticipated reduced exposure to sediment.
2 - 10 percent of noncarcinogenic RBC/PRG is less then the carcinogenic RBC/PRG.
3 - The value for mercuric chloride have been used as a surrogate for mercury.
4 - USEPA, 2006. Region 3 Freshwater Sediment Screening Benchmarks. August. http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fwsed/screenbench.htm
5 - MacDonald, D.D., C.G. Ingersoll, and T.A. Berger, 2000. "Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems." Archives of Environmental Contamination and Toxicology, Vol. 39, pp. 20-31.
These values are considered only if no Region 3 BTAG values are not available.
6 - Buchman, M. F., 2006. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle, WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration. http://response.restoration.noaa.gov/cpr/sediment/squirt/squirt.html
These values are considered only if there are no Region 3 BTAG or TEC values available.

SAP Worksheet #15B - Groundwater Reference Limits and Evaluation Background Table

CAS Number	Chemical	ORNL RBC[1] Tap Water (ug/L)	USEPA MCL[2] (ug/L)	MDE Generic Numeric Cleanup Standards[3] (ug/L)
Volatile Organic Compounds				
71-43-2	Benzene	0.041 C	5	5
75-15-0	Carbon Disulfide	100 N	NA	100
67-66-3	Chloroform	0.019 C	80	80
60-29-7	Ethyl Ether	730 N	NA	NA
75-09-2	Methylene chloride	0.48 C	5	5
108-88-3	Toluene	230 N	1000	1000
Explosives				
99-35-4	1,3,5-Trinitrobenzene	110 N	NA	NA
99-65-0	1,3-Dinitrobenzene	0.37 N	NA	NA
118-96-7	2,4,6-Trinitrotoluene	0.22 C	NA	NA
121-14-2	2,4-Dinitrotoluene	7.3 N	NA	50
606-20-2	2,6-Dinitrotoluene	3.7 N	NA	50
2691-41-0	HMX	180 N	NA	NA
99-08-1	3-Nitrotoluene	NA	NA	NA
88-72-2	2-Nitrotoluene	37 N	NA	NA
99-99-0	4-Nitrotoluene	0.42 C	NA	NA
19406-51-0	4-Amino-2,6-Dinitrotoluene	7.3 N	NA	NA
35572-78-2	2-Amino-4,6-Dinitrotoluene	7.3 N	NA	NA
479-45-8	Tetryl	15 N	NA	NA
98-95-3	Nitrobenzene	0.34 N	NA	NA
121-82-4	RDX	0.061 C	NA	NA
55-63-0	Nitroglycerin	0.37 N	NA	NA
9004-70-0	Nitrocellulose	NA	NA	NA
556-88-7	Nitroguanidine	370 N	NA	NA
14797-73-0	Perchlorate	2.6 N	NA	NA
78-11-5	PETN	NA	NA	NA
618-87-1	3,5-Dinitroaniline	NA	NA	NA
Metals				
7429-90-5	Aluminum	3700 N	50[7]	50
7440-36-0	Antimony	1.5 N	6	6
7440-38-2	Arsenic	0.0045 C	10	50
7440-39-3	Barium	730 N	2000	2000
7440-41-7	Beryllium	7.3 N	4	4

CAS Number	Chemical	ORNL RBC[1] Tap Water (ug/L)	USEPA MCL[2] (ug/L)	MDE Generic Numeric Cleanup Standards[3] (ug/L)
7440-43-9	Cadmium	1.8 N	5	5
7440-70-2	Calcium	NA	NA	NA
7440-47-3	Chromium	5500 N	100	100
7440-48-4	Cobalt	NA	NA	73
7440-50-8	Copper	150 N	1300	1300
7439-89-6	Iron	2600 N	300[7]	300
7439-93-2	Lithium	NA	NA	NA
7439-92-1	Lead	NA	15	15
7439-95-4	Magnesium	NA	NA	NA
7439-96-5	Manganese	88 N	50[7]	50
7439-97-6	Mercury	1.1 N[6]	2	2
7440-02-0	Nickel	73 N	NA	73
7440-09-7	Potassium	NA	NA	NA
7782-49-2	Selenium	18 N	50	50
7440-22-4	Silver	18 N	100[7]	180
7440-23-5	Sodium	NA	NA	NA
7440-24-6	Strontium	2200 N	NA	NA
7440-28-0	Thallium	0.24 N	2	2
7440-31-5	Tin	2200 N	NA	2.2
7440-62-2	Vanadium	26 N	NA	50
7440-66-6	Zinc	1100 N	5000[7]	1100

Notes

C - Carcinogenic

MCL - Maximum Contaminant Level

MDE - Maryland Department of the Environment

N - Noncarcinogenic

RBC - Risk-Based Concentration

1 -ORNL Risk-Based Concentration Table. The noncarcinogenic values (denoted with a "N" flag) are the RBC divided by 10 to correspond to a target hazarc of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (ORNL RBC, July 2008).

2 - 2006 Edition of the Drinking Water Standards and Health Advisories, August 2006.

3 - State of Maryland, Department of the Environment, Cleanup Standards for Soil and Groundwater, August 2001, Interim Final Guidance (Update No. 1).

4 - The value for acenaphthene have been used as a surrogate for acenaphthylene.

5 - The value for pyrene has been used as a surrogate for benzo(g,h,i)perylene and phenanthrene.

6 - The value for mercuric chloride have been used as a surrogate for mercury.

7 - Secondary MCL.

APPENDIX I

DATA VALIDATION AND USABILITY ASSESSMENT
(ON CD)

APPENDIX J

STATISTICAL CALCULATIONS
(ON CD)

TABLE J-1

EXPOSURE POINT CONCENTRATIONS
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

parameter	PAL (MG/KG)	BACKGROUND[1]	MAXIMUM CONCENTRATION	EPC (MG/KG)	EPC TYPE
UXO 10					
NITROGLYCERIN	0.61	NA	**0.91**	NA[2]	NA
UXO 23 TORPEDO CASING DISPOSAL AREA					
ALUMINUM	7700	35400	**35500**	24629	95% Student's T UCL
IRON	5500	83100	**89500**	35971	95% Chebyshev (Mean, SD)
LITHIUM	2	NA	**29.6**	**19**	95% Student's T UCL
TIN	0.89	NA	**1.5**	**0.975**	95% KM (t) UCL
UXO 28 EOD SCHOOL DEMOLITION AREA					
ANTIMONY	0.27	NA	**2.3**	**0.547**	95% KM (Chebyshev) UCL
CHROMIUM	**26**	33.4	**40**	24.1	95% Approximate Gamma
COPPER	28	20.3	**50**	25	95% Chebyshev (Mean, SD)
LEAD	11	62.5	**198**	38.1	Average [3]
MAGNESIUM	4400	1620	**7480**	2029	95% Modified T UCL
MERCURY	0.058	0.16	**0.85**	0.156	95% KM (Chebyshev) UCL
SILVER	4.2	0.84	**9.8**	0.93	95% KM (t) UCL
ZINC	46	37.5	**483**	**130**	95% Chebyshev (Mean, SD)
UXO 4 SURFACE					
ALUMINUM	7700	19700	**26000**	**19947**	95% Chebyshev (Mean, SD)
ANTIMONY	0.27	NA	0.099	0.049	95% KM (t) UCL
COPPER	28	20.3	**89**	**29.1**	95% Chebyshev (Mean, SD)
LEAD	11	62.5	**122**	35.6	Average [3]
LITHIUM	2	NA	**28.3**	**17.4**	95% Student's T UCL
MERCURY	0.058	0.16	**0.57**	0.152	95% KM (Chebyshev) UCL
NICKEL	38	15.4	**84.4**	**21.3**	95% Modified (T) UCL
TIN	0.89	NA	**1.7**	NA[2]	NA
ZINC	46	37.5	**239**	**65.7**	95% Modified (T) UCL
TOTAL SOLIDS	NA	79.2	**83.3**	79.2	95% Student's T UCL
BENZENE	0.0019	NA	**0.135**	**0.002**	95% KM (t) UCL
UXO 4 SUBSURFACE					
LITHIUM	2	NA	**31.6**	**20.7**	95% Student's T UCL
ZINC	46	70.4	**80.5**	42.4	95% Approximate Gamma UCL
BENZENE	0.019	NA	**0.14**	0.032	95% KM(T) UCL
UXO 5 SURFACE SOIL					
ALUMINUM	7700	19700	**32400**	13593	95% Approximate Gamma UCL
ARSENIC	0.026	14.9	**15.7**	4.6	95% Chebyshev (Mean, SD) UCL

TABLE J-1

EXPOSURE POINT CONCENTRATIONS
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

COPPER	28	20.3	**60.1**	18.8	95% Student's T UCL
MANGANESE	160	1390	**1670**	477	95% Approximate Gamma UCL
MERCURY	0.058	0.16	**1.2**	**0.43**	99% Chebyshev (Mean, SD) UCL
NICKEL	38	15.4	**230**	**39.2**	95% Chebyshev (Mean, SD) UCL
ZINC	46	70.4	**73.6**	40.7	95% Student's T UCL
UXO 5 SUBSURFACE					
ALUMINUM	7700	35400	**50800**	26413	95% Student's T UCL
BARIUM	330	134	**354**	85.7	95% Modified T UCL
CADMIUM	0.36	0.61	**8.5**	**1.3**	95% KM(Chebyshev) UCL
LITHIUM	2	NA	**41**	**21.8**	95% Student's T UCL
TIN	0.89	NA	**1.5**	**1.5**[(2)]	Maximum Concentration
ZINC	46	70.4	**78.7**	45.4	95% Student's T UCL
UXO 2 SUBSURFACE					
LITHIUM	2	NA	**36.8**	**16.1**	95% Modified T UCL
TIN	0.89	NA	**0.97**	**0.97**[(2)]	Maximum Concentration
ZINC	46	70.4	**77.8**	32.5	95% H UCL

Shaded cell indicates that UCL exceeds PAL and the background concentration.
(1) = Basewide Background 95% UTL.
(2) = There are too few detected concentrations to calculate a UCL.
(3) = For Lead the average concentration is used instead of the UCL.

NA = Not Applicable
PAL = Project Action Limit
UCL = Upper Confidence Limit calculated using Pro UCL 4.0.004 software.
UTL = Upper Tolerance Limit.

APPENDIX K

HUMAN HEALTH RISK SCREENING SUPPORTING DOCUMENTATION (ON CD)

APPENDIX K
TABLE 5-2

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
AREA 8 (UXO-02)
NAVY SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Lithium	16.1	NA	NA	None Specified	160	0.1
		Total ILCR	NA		Total HI	0.1

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1×10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 5-3

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
AREA 8 (UXO-02)
NAVY SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Lithium	16.1	NA	NA	None Specified	2000	0.01
		Total ILCR	NA		Total HI	0.01

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1×10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 6-2

SUMMARY OF RECEPTOR RISKS AND HAZARDS - GROUNDWATER
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

CAS No.	Sample Location	USEPA RSL Tap Water[(1)]		Target Organs	X04GW001 X0426MW01		
		Carc.	Noncarc.		Conc.	ILCR	HI
Explosives (ug/L)							
118-96-7	2,4,6-Trinitrotoluene	2.2	18	Liver	0.19 U		
Inorganics (ug/L)							
7429-90-5	Aluminum	NA	37,000	Body Weight	180 J		0.005
7440-38-2	Arsenic	0.045	11	Cardiovascular, Skin	1.3 J	3E-05	0.1
7440-39-3	Barium	NA	7,300	Kidney	140 J		0.02
7440-41-7	Beryllium	NA	73	Gastrointestinal	0.3 U		
7440-47-3	Chromium	NA	55,000	None Specified	2 U		
7440-48-4	Cobalt	NA	11	Cardiovascular	22 J		2
7440-50-8	Copper	NA	1,500	Gastrointestinal	3.6 U		
7439-89-6	Iron	NA	26,000	Gastrointestinal, Blood	220 J		0.008
7439-92-1	Lead	NA	NA	--	2.2 U		
7439-96-5	Manganese	NA	880	Neurological	200 J		0.2
7440-02-0	Nickel	NA	730	Body Weight	30		0.04
7782-49-2	Selenium	NA	180	Hair Loss, Neurological, Skin	7.7 B		
7440-24-6	Strontium	NA	22,000	Bone	57		0.003
7440-62-2	Vanadium	NA	180	Blood	2 U		
7440-66-6	Zinc	NA	11,000	Blood	45		0.004
					Total	**3E-05**	**2**

1 - USEPA Regional Screening Level Table. May 2010.
Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.
HI - Hazard Index.
ILCR - Incremental lifetime cancer risk.
NA - No value available.

Target Organ HIs	
Total Body Weight HI =	0.005
Total Cardiovascular HI =	**2**
Total Skin HI =	0.1
Total Kidney HI =	0.02
Total Gastrointestinal HI =	0.008
Total Blood HI =	0.01
Total Neurological HI =	0.2
Total Bone HI =	0.003

APPENDIX K
TABLE 6-2

SUMMARY OF RECEPTOR RISKS AND HAZARDS - GROUNDWATER
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

CAS No.	Sample Location	USEPA RSL Tap Water[(1)]		Target Organs	X04GW002 X0426MW02		
		Carc.	Noncarc.		Conc.	ILCR	HI
Explosives (ug/L)							
118-96-7	2,4,6-Trinitrotoluene	2.2	18	Liver	0.2 U		
Inorganics (ug/L)							
7429-90-5	Aluminum	NA	37,000	Body Weight	68 J		0.002
7440-38-2	Arsenic	0.045	11	Cardiovascular, Skin	1 U		
7440-39-3	Barium	NA	7,300	Kidney	77 J		0.01
7440-41-7	Beryllium	NA	73	Gastrointestinal	0.44 J		0.006
7440-47-3	Chromium	NA	55,000	None Specified	2 U		
7440-48-4	Cobalt	NA	11	Cardiovascular	4.3 J		0.4
7440-50-8	Copper	NA	1,500	Gastrointestinal	5.9 J		0.004
7439-89-6	Iron	NA	26,000	Gastrointestinal, Blood	74 J		0.003
7439-92-1	Lead	NA	NA	--	2.2 U		
7439-96-5	Manganese	NA	880	Neurological	110 J		0.1
7440-02-0	Nickel	NA	730	Body Weight	21 J		0.03
7782-49-2	Selenium	NA	180	Hair Loss, Neurological, Skin	2.8 J		0.02
7440-24-6	Strontium	NA	22,000	Bone	16		0.0007
7440-62-2	Vanadium	NA	180	Blood	2 U		
7440-66-6	Zinc	NA	11,000	Blood	53		0.005
					Total		**0.6**

1 - USEPA Regional Screening Level Table. May 2010.
Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.
HI - Hazard Index.
ILCR - Incremental lifetime cancer risk.
NA - No value available.

Target Organ HIs

Total Body Weight HI =	0.002
Total Cardiovascular HI =	0.4
Total Skin HI =	0.02
Total Kidney HI =	0.01
Total Gastrointestinal HI =	0.01
Total Blood HI =	0.008
Total Neurological HI =	0.1
Total Hair Loss HI =	0.02
Total Bone HI =	0.0007

APPENDIX K
TABLE 6-2

SUMMARY OF RECEPTOR RISKS AND HAZARDS - GROUNDWATER
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

CAS No.	Sample Location	USEPA RSL Tap Water[(1)]		Target Organs	X04GW002-D X0426MW02		
		Carc.	Noncarc.		Conc.	ILCR	HI
Explosives (ug/L)							
118-96-7	2,4,6-Trinitrotoluene	2.2	18	Liver			
Inorganics (ug/L)							
7429-90-5	Aluminum	NA	37,000	Body Weight	1800 J		0.05
7440-38-2	Arsenic	0.045	11	Cardiovascular, Skin	1 U		
7440-39-3	Barium	NA	7,300	Kidney	33 J		0.005
7440-41-7	Beryllium	NA	73	Gastrointestinal	0.34 J		0.005
7440-47-3	Chromium	NA	55,000	None Specified	8.8		0.0002
7440-48-4	Cobalt	NA	11	Cardiovascular	16 J		1
7440-50-8	Copper	NA	1,500	Gastrointestinal	6.8 J		0.005
7439-89-6	Iron	NA	26,000	Gastrointestinal, Blood	2100 J		0.08
7439-92-1	Lead	NA	NA	--	9.9 L		
7439-96-5	Manganese	NA	880	Neurological	47 J		0.05
7440-02-0	Nickel	NA	730	Body Weight	10 J		0.01
7782-49-2	Selenium	NA	180	Hair Loss, Neurological, Skin	4 B		
7440-24-6	Strontium	NA	22,000	Bone	11		0.0005
7440-62-2	Vanadium	NA	180	Blood	8.2		0.05
7440-66-6	Zinc	NA	11,000	Blood	13 J		0.001
					Total		**2**

1 - USEPA Regional Screening Level Table. May 2010.
Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.
HI - Hazard Index.
ILCR - Incremental lifetime cancer risk.
NA - No value available.

Target Organ HIs

Total Body Weight HI =	0.05
Total Cardiovascular HI =	1
Total Kidney HI =	0.005
Total Gastrointestinal HI =	0.09
Total None Specified HI =	0.0002
Total Blood HI =	0.1
Total Neurological HI =	0.05
Total Bone HI =	0.0005

APPENDIX K
TABLE 6-2

SUMMARY OF RECEPTOR RISKS AND HAZARDS - GROUNDWATER
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

CAS No.	Sample Location	USEPA RSL Tap Water[(1)]		Target Organs	X04GW003 X0426MW03		
		Carc.	Noncarc.		Conc.	ILCR	HI
Explosives (ug/L)							
118-96-7	2,4,6-Trinitrotoluene	2.2	18	Liver	0.095 J	4E-08	0.005
Inorganics (ug/L)							
7429-90-5	Aluminum	NA	37,000	Body Weight	1900 J		0.05
7440-38-2	Arsenic	0.045	11	Cardiovascular, Skin	1 U		
7440-39-3	Barium	NA	7,300	Kidney	42 J		0.006
7440-41-7	Beryllium	NA	73	Gastrointestinal	0.3 U		
7440-47-3	Chromium	NA	55,000	None Specified	3.4 J		0.00006
7440-48-4	Cobalt	NA	11	Cardiovascular	5.9 J		0.5
7440-50-8	Copper	NA	1,500	Gastrointestinal	3.7 J		0.002
7439-89-6	Iron	NA	26,000	Gastrointestinal, Blood	1500 J		0.06
7439-92-1	Lead	NA	NA	--	2.2 U		
7439-96-5	Manganese	NA	880	Neurological	23 J		0.03
7440-02-0	Nickel	NA	730	Body Weight	7.3 U		
7782-49-2	Selenium	NA	180	Hair Loss, Neurological, Skin	2.9 B		
7440-24-6	Strontium	NA	22,000	Bone	8.9		0.0004
7440-62-2	Vanadium	NA	180	Blood	4.4 J		0.02
7440-66-6	Zinc	NA	11,000	Blood	11 J		0.001
					Total	**4E-08**	**0.7**

1 - USEPA Regional Screening Level Table. May 2010.
Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.
HI - Hazard Index.
ILCR - Incremental lifetime cancer risk.
NA - No value available.

Target Organ HIs

Total Liver HI =	0.005
Total Body Weight HI =	0.05
Total Cardiovascular HI =	0.5
Total Kidney HI =	0.006
Total Gastrointestinal HI =	0.06
Total None Specified HI =	0.00006
Total Blood HI =	0.08
Total Neurological HI =	0.03
Total Bone HI =	0.0004

APPENDIX K
TABLE 6-6

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Aluminum	19,947	NA	NA	Central Nervous System	77,000	0.3
Lithium	17.4	NA	NA	None Specified	160	0.1
		Total ILCR	NA		Total HI	0.4

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 6-7

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Aluminum	19,947	NA	NA	Central Nervous System	990,000	0.02
Lithium	17.4	NA	NA	None Specified	2,000	0.009
		Total ILCR	NA		Total HI	0.03

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 6-8

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Lithium	20.7	NA	NA	None Specified	160	0.1
		Total ILCR	NA		Total HI	0.1

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1×10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 6-9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Lithium	20.7	NA	NA	None Specified	2,000	0.01
		Total ILCR	NA		Total HI	0.01

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1×10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 7-11a

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SURFACE SOIL
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Aluminum	13,593	NA	NA	Central Nervous System	77,000	0.2
Arsenic	4.60	0.39	1.2E-05	Skin, Cardiovascular System	22	0.2
Manganese	477	NA	NA	Central Nervous System	1,800	0.3
Nickel	39.2	NA	NA	Kidney	1,500	0.03
		Total ILCR	1E-05		Total HI	0.7

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 7-11b

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Aluminum	26,413	NA	NA	Central Nervous System	77,000	0.3
Cadmium	1.3	1,800	7E-10	Kidney	70	0.02
Lithium	21.8	NA	NA	None Specified	160	0.1
		Total ILCR	7E-10		Total HI	0.5

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 7-12a

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SURFACE SOIL
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Aluminum	13,593	NA	NA	Central Nervous System	990,000	0.01
Arsenic	4.60	1.6	2.9E-06	Skin, Cardiovascular System	260	0.02
Manganese	477	NA	NA	Central Nervous System	2,300	0.2
Nickel	39.2	NA	NA	Kidney	20,000	0.002
		Total ILCR	3E-06		Total HI	0.2

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1×10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 7-12b

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Aluminum	26,413	NA	NA	Central Nervous System	990,000	0.03
Cadmium	1.3	9,300	1E-10	Kidney	800	0.002
Lithium	21.8	NA	NA	None Specified	2,000	0.01
		Total ILCR	1E-10		Total HI	0.04

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.

2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1×10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.

NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 13-14

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - RESIDENTIAL EXPOSURES TO SUBSURFACE SOIL
EOD School Demolition Area (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Chromium[3]	24.1	NA	NA	None Specified	120,000	0.0002
		Total ILCR	NA		Total HI	0.0002

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.
2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.
3 - Value is for trivalent chromium.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX K
TABLE 13-15

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs - TYPICAL INDUSTRIAL EXPOSURES TO SUBSURFACE SOIL
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Incremental Lifetime Carcinogenic Risk (ILCR)			Estimated Non-Carcinogenic Hazard Quotient (HQ)		
	Exposure Point Concentration[1] (mg/kg)	RSL[2] (mg/kg)	Estimated ILCR	Primary Target Organs	RSL[2] (mg/kg)	Estimated HQ
Lithium	24.1	NA	NA	None Specified	1,500,000	0.00002
		Total ILCR	NA		Total HI	0.00002

1 - 95 Percent upper confidence limit calculated using USEPA's ProUCL Version 4.00.04.
2 - USEPA Regional Screening Level Table (May 2010). Carcinogenic values correspond to a 1 x 10^{-6} cancer risk level. Noncarcinogenic values corresponds to a hazard index of 1.
NA - Not applicable. There are no cancer slope factors (CSF) available for this chemical.

APPENDIX L

ECOLOGICAL RISK SCREENING SUPPORTING DOCUMENTATION (ON CD)

APPENDIX L
CHEMICAL ECOTOXICITY

Appendix L presents a discussion of the different chemical classes detected at the sites, including toxicity information, potential food chain and trophic transfer, and bioaccumulation potential.

Metals

Many metals occur naturally at various concentrations in the surface water and sediment primarily to chemical weathering of rocks and fallout from volcanoes. Most metals are toxic to aquatic (i.e., fish, invertebrates) and terrestrial (i.e., plants, invertebrates, vertebrates) ecological receptors above certain concentrations, with some metals being more toxic at lower concentrations than others. Also, different chemical forms of the metals may be more toxic than others. For example, hexavalent chromium is typically more toxic than trivalent chromium, and methylmercury is more toxic than inorganic mercury. In addition, the toxicity of several metals (cadmium, chromium, copper, lead, nickel, silver, and zinc) to aquatic receptors in freshwater systems decreases with increasing water hardness.

Many factors (e.g., pH, Eh, clay content, organic matter content) influence the bioavailability of metals to invertebrates in sediment. One way to estimate the bioavailable portion of certain divalent metals (cadmium, copper, lead, nickel, and zinc) in sediment is to measure the amount of acid volatile sulfides (AVS) and simultaneously extracted metals (SEM) in a sediment sample. If the molar concentration of AVS is higher than the molar concentration of SEM, than the SEM metals are expected to be unavailable to aquatic invertebrates and, therefore, nontoxic. AVS plays little or no role in determining interstitial water concentrations of metals in aerobic systems or those with low productivity (i.e., where the absence of organic carbon limits sulfate reduction) (Ankley et al., 1995), or when ingestion of sediments is the primary exposure route (Lee et al., 2000).

Explosives

Some of the more common explosives include nitroaromatic compounds such as 2,4,6-trinitrotoluene, hexahydro-1,3,5-trinitro-1,3,5-triazine, octahydro-1,3,5,7-tetranitro-1,3,5-tetrazocine, N-methyl-N,2,4,6-tetranitroaniline, and associated by-products and degradation products that may have been released to the environment during manufacturing and load, assembly, and pack processes at military facilities (Talmage et al., 1999). These explosives are moderately to highly toxic to freshwater organisms, with chronic screening values less than 1 mg/L, although some of the screening values are low because of the conservative methods used

to develop them based on an absence of data (Talmage et al., 1999). Available data indicate that none of the compounds are expected to bioconcentrate (Talmage et al., 1999). Most of the explosives do not appear to be highly toxic to mammals. Terrestrial reference values (TRVs) are greater than 1 mg/kg-day.

Explosives have little to moderate potential to adsorb to soil and sediment (Talmage et al., 1999). Therefore, explosives will have moderate to high mobility in soils and sediment, and most of the explosives will be found in the water column (Talmage et al., 1999).

References:

Ankley, Gerald T., D.M. Di Toro, D.J. Hansen, and W.J. Berry. 1995. Technical Basis and Proposal for Deriving Sediment Quality Criteria for Metals. Environmental Toxicology and Chemistry. Vol. 15(12), pp. 2056-2066.

Lee, Byeong-Gweon, Sarah B. Griscom, Jung-Suk Lee, Heesun J. Choi, Chul-Hwan Koh, Samuel N Lucoma, and Nicvholas S. Fisher. 2000. Influences of Dietary Uptake and Reactive Sulfides on Metal Bioavailability from Aquatic Sediments. Science, Volume 287, pp. 282-284. January 14.

Talmage, Sylvia S., Dennis M. Opresko, Christopher J. Maxwell, Christopher J.E. Welsh, F. Michael Cretella, Patricia H. Reno, and F. Bernard Daniel, 1999. "Nitroaromatic Munition Compounds: Environmental Effects and Screening Values." Rev. Environmen. Contam. Toxicol. 161:1-156.

APPENDIX L

FOOD CHAIN MODEL RECEPTOR PROFILES

The following sections present the receptor profiles for the short-tailed shrew, American robin, meadow vole, and northern bobwhite quail. The majority of the information for the profiles was obtained from the Wildlife Exposure Factors Handbook (USEPA, 1993). The data for the incidental soil ingestion rates were obtained from the Estimates of Soil Ingestion by Wildlife (Beyer, 1994) or the USEPA Ecological Soil Screening Guidance (USEPA, 2007).

The food and water ingestion rates are listed in g/g (of body weight)-day on a wet weight basis but were converted to dry weight for the ERA. The home ranges are presented in hectares in USEPA (1993) but were converted to acres by multiplying the number of hectares by 2.471. Also note that the estimated percent of soil in the diets are listed in dry weight. The attached table presents the calculation of the exposure parameters and how the calculations were done.

Short-Tailed Shrew (*Blarina brevicauda*)

Shrews inhabit a wide variety of habitats and are common in areas with abundant vegetative cover. They need cool, moist habitats because of their high metabolic and water-loss rates. The short-tailed shrew is primarily carnivorous, eating insects such as earthworms, slugs, and snails.

The adult body weight for the short-tailed shrew in various habitats ranged from 0.015 to 0.01921 kg with an average of 0.0161 kg. The listed food ingestion rates for shrews are 0.49 and 0.62 g/g-day (wet-weight). The water ingestion rate was listed as 0.223 g/g-day. The food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The food ingestion rates were then multiplied by 0.16, which is the percent solids of worms (Sample et al., 1997) to convert the ingestion rate from a wet-weight value to a dry-weight value. The incidental soil ingestion rate was calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested (assumed 3% for conservative food chain model and 0.9% for the average food chain model) from USEPA (2007). 3% is the 90th percentile value and 0.9% is the 50th percentile value from USEPA (2007). The home range for the shrew (0. 9699 acres) was calculated using data from a tamarek bog in Manitoba (only value available).

American Robin (*Turdus migratorius*)

American robins' habitats include parks, lawns, moist forests, swamps, open woodlands, and orchards. Robins forage on the ground in open areas, along habitat edges, or the edges of streams. They also may forage above ground in shrubs and within the lower branches of trees. In the months preceding and during

the breeding season, robins feed primarily on invertebrates and on some fruits. During the rest of the year their diet consists primarily of fruits.

The adult body weight for the American robin in New York woodlands and forests and in Pennsylvania ranged from 0.0773 to 0.0862 kg with an average of 0.0804 kg. The only listed food ingestion rates were for robins in Kansas (1.52 g/g-day) and California (0.89 g/g-day), with an average of 1.205 g/g-day. Studies calculating ingestion rates for the robin included in the USEPA (December 1993) are based on a diet comprised of berries. Based on these studies, the food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The food ingestion rates were then multiplied by 0.23, which is the percent solids of fruit (Sample et al., 1997) to convert the ingestion rate from a wet-weight value to a dry-weight value. However, because it is assumed that the robin 100 percent of the robin's diet are worms for the food chain models, the ingestion rate for the robin was calculated using field metabolism scaling as presented on the attached table (Nagy et al., 1999). These are the values that will be used in the food chain model for this site.

The water ingestion rate was estimated as 0.14 g/g-day. The incidental soil ingestion rate was calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested (assumed 16.4% for conservative food chain model and 6.4% for the average food chain model) from USEPA (2007). The 16.4% and 6.4% values are from the American woodcock since it is assumed that both the woodcock and robin are consuming 100% worms, and no incidental soil ingestion rate was available for the robin.

The home range for the robin was calculated using data from Tennessee and a New York dense conifer forest. The values ranged from 0.27 to 1.04 acres with an average home range of 0.6095 acres.

Meadow Vole (*Microtus pennsylvanicus*)

Meadow voles inhabit grassy fields, marshes, and bogs; however, they prefer fields with more grass, more cover, and fewer woody plants. They typically consume green succulent vegetation, sedges, seeds, roots, bark, fungi, insects, and animal matter. However, green succulent vegetation makes up the majority of their diet.

The adult body weight for the vole ranges from 0.017 to 0.0524 kg with an average of 0.0358 kg. The only listed food ingestion rates for voles range from 0.30 to 0.35 g/g-day (wet-weight), with an average of 0.325 g/g-day. The water ingestion rates are 0.14 (estimated) and 0.21 g/g-day, with an average of 0.175 g/g-day. The food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The food ingestion rates were then multiplied by 0.15, which is the percent solids of plant foilage (USEPA, 2007) to convert the ingestion rate from a wet-weight value to a dry-weight value. Finally, the incidental soil ingestion rate is calculated by multiplying the ingestion rate by the percentage of soil that is

incidentally ingested, which was 3.2% for conservative food chain model and 1.2% for the average food chain model) from USEPA (2007). The home range for the meadow vole ranges from 0.000494 to 0.2051 acres with an average home range of 0.0659 acres.

Northern Bobwhite Quail (*Colinus virginianus*)

Quails inhabit grasslands, idle fields, pastures, and large clumps of grasses. Bobwhite quails forage in areas with open vegetation, some bare ground, and light litter. Seeds from weeds, woody plants, and grasses comprise the majority of an adult's diet, although green vegetation has been found to dominate the diet of this species in winter in the southern areas of the United States.

The adult body weight for the bobwhite quail ranges from 0.154 to 0.1939 kg with an average of 0.1751 kg. The listed food ingestion rates for quails range from 0.067 to 0.093 g/g-day (dry-weight), with an average of 0.078 g/g-day. The water ingestion rate is estimated as 0.10 and 0.11 g/g-day, and measured as 0.10 to 0.13 g/g-day, for an average water ingestion rate of 0.11 g/g-day. The food and water ingestion rates in kg/day and L/day, respectively, were calculated as shown in the attached table. The food ingestion rates were already dry-weight values. Finally, the incidental soil ingestion rate is calculated by multiplying the ingestion rate by the percentage of soil that is incidentally ingested, which was 13.9% for conservative food chain model and 6.1% for the average food chain model from USEPA (2007) and was based on the mourning dove.

The home range for the quail ranges from 8.9 to 41.3 acres with an average home range of 18.8 acres.

References:

Beyer, N., E. Connor, and S. Gerould. 1994. Estimates of Soil Ingestion by Wildlife. Journal of Wildlife Management 58(2) pp. 375-382.

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USEPA, 2007. Guidance for Developing Ecological Soil Screening Level, Attachment 4-1, Exposure Factors and Bioaccumulation Models for Derivation of Wildlife Eco-SSLs. Office of Solid Waste and Emergency and Response. OSWER Directive 9285.7-55. April.

APPENDIX TABLE L-1

SOIL ECOLOGICAL SCREENING LEVELS
NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

	Ecological Screening Level							
	Invertebrates		Plants		Avian		Mammals	
Chemical	Value	Source	Value	Source	Value	Source	Value	Source
Volatile Organics (ug/kg)								
BENZENE	31000	Canadian SQG	31000	Canadian SQG	25000	Canadian SQG	25000	Canadian SQG
TOLUENE	75000	Canadian SQG	75000	Canadian SQG	1400000	Canadian SQG	1400000	Canadian SQG
Explosives (mg/kg)								
1,3-DINITROBENZENE	NA	NA	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics (mg/kg)								
ALUMINUM	pH<5.5	EcoSSL	pH<5.5	EcoSSL	NA	NA	NA	NA
ANTIMONY	78	EcoSSL	5	NOAA	NA	NA	0.27	EcoSSL
ARSENIC	60	NOAA	18	EcoSSL	43	EcoSSL	46	EcoSSL
BARIUM	330	EcoSSL	500	NOAA	440	R3 BTAG	2000	EcoSSL
BERYLLIUM	40	EcoSSL	10	NOAA	NA	NA	21	EcoSSL
CADMIUM	140	EcoSSL	32	EcoSSL	0.77	EcoSSL	0.36	EcoSSL
CHROMIUM	64	Canadian SQG	64	Canadian SQG	26	EcoSSL	34	EcoSSL
COBALT	200	R3 BTAG	13	EcoSSL	120	EcoSSL	230	EcoSSL
COPPER	80	EcoSSL	70	EcoSSL	28	EcoSSL	49	EcoSSL
IRON	NA	NA	pH<5, pH>8	EcoSSL	NA	NA	NA	NA
LEAD	1700	EcoSSL	120	EcoSSL	11	EcoSSL	56	EcoSSL
LITHIUM	NA	NA	2	NOAA	NA	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	450	EcoSSL	220	EcoSSL	4300	EcoSSL	4000	EcoSSL
MERCURY	12	Canadian SQG	12	Canadian SQG	0.058	R3 BTAG	1.58	NOAA
MOLYBDENUM	0.59	R3 BTAG	2	NOAA	0.59	R3 BTAG	0.59	R3 BTAG
NICKEL	280	EcoSSL	38	EcoSSL	210	EcoSSL	130	EcoSSL
SELENIUM	4.1	EcoSSL	0.52	EcoSSL	1.2	EcoSSL	0.63	EcoSSL
SILVER	NA	NA	560	EcoSSL	4.2	EcoSSL	14	EcoSSL
SODIUM	NA	NA	NA	NA	NA	NA	NA	NA
STRONTIUM	120	R3 BTAG	120	R3 BTAG	120	R3 BTAG	120	R3 BTAG
THALLIUM	1.4	Canadian SQG	1.4	Canadian SQG	NA	NA	0.0569	NOAA
TIN	0.89	R3 BTAG	50	NOAA	0.89	R3 BTAG	7.62	NOAA
VANADIUM	130	Canadian SQG	130	Canadian SQG	7.8	EcoSSL	280	EcoSSL
ZINC	120	EcoSSL	160	EcoSSL	46	EcoSSL	79	EcoSSL

Screening Level Sources in the order of Preference:
Eco SSL - EPA Ecological Soil Screening Levels (EPA, 2003, 2005, 2006, 2007, 2008)
Canadian SQG - Canadian Soil Quality Guidelines (CCME, 2006 and supporting documents)
NOAA - Values from sources as compiled in NOAA's Quick Reference Tables (Buchman, 2008)
EPA Region 3 BTAG (R3 BTAG) Surface Soil Screening Levels (EPA, 1995)

TABLE L-2

EXPOSURE PARAMETERS FOR THE TERRESTRIAL WILDLIFE MODEL
NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Species/Exposure Inputs	Conservative Inputs		Average Inputs	
	Values	Units	Values	Units
Bobwhite Quail				
Body Weight = BW	1.540E-01	kg	1.751E-01	kg
Food Ingestion Rate = If	1.628E-02	kg/day	1.361E-02	kg/day
Water Ingestion Rate = Iw	2.276E-02	L/day	1.926E-02	L/day
Soil Ingestion Rate = Is	2.263E-03	kg/day	8.304E-04	kg/day
Home Range = HR	Assume 100% on site		1.880E+01	acres
Meadow Vole				
Body Weight = BW	1.700E-02	kg	3.580E-02	kg
Food Ingestion Rate = If	1.878E-03	kg/day	1.744E-03	kg/day
Water Ingestion Rate = Iw	7.513E-03	L/day	6.261E-03	L/day
Soil Ingestion Rate = Is	6.010E-05	kg/day	2.093E-05	kg/day
Home Range = HR	Assume 100% on site		6.590E-02	acres
American Robin				
Body Weight = BW	7.73E-02	kg	8.04E-02	kg
Food Ingestion Rate = If	1.25E-02	kg/day	1.19E-02	kg/day
Water Ingestion Rate = Iw	1.21E-02	L/day	1.13E-02	L/day
Soil Ingestion Rate - Is	2.046E-03	kg/day	7.601E-04	kg/day
Home Range = HR	Assume 100% on site		6.095E-01	acres
Short-Tailed Shrew				
Body Weight = BW	1.500E-02	kg	1.610E-02	kg
Food Ingestion Rate = If	1.600E-03	kg/day	1.433E-03	kg/day
Water Ingestion Rate = Iw	4.280E-03	L/day	3.600E-03	L/day
Soil Ingestion Rate - Is	4.801E-05	kg/day	1.289E-05	kg/day
Home Range = HR	Assume 100% on site		9.699E-01	acres

Notes:
The exposure factors were derived as presented in Appendix Table L-3.

The soil ingestion rates were calculated by multiplying the food ingestion rates
by the following incidental soil/sediment ingestion rates:

Receptor	Conservative	Average	Source
Bobwhite quail	13.90%	6.10%	1, 2
Meadow Vole	3.20%	1.20%	1
American Robin	16.40%	6.40%	1,3
Short-tailed Shrew	3%	0.90%	1

1 - USEPA (U.S. Environmental Protection Agency), 2007. Ecological Soil Screening Level Guidance, Office of Emergency and Remedial Response. February.
2 - Based on the mourning dove.
3 - Based on the American woodcock

APPENDIX P-2

DRY WEIGHT DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR TERRESTRIAL FOOD CHAIN MODELS
DUMP ROAD, LOCKHEED MARTIN, MARTIN STATE AIRPORT
MIDDLE RIVER, MARYLAND

Data from EPA (1993)				Derivation of Factors for Modeling		
Species/Factor	**Age/Sex/ Cond./Seas.**	**Value**	**Study Average**	**Calculation of Values**		**Notes**
American Robin						
Body Weight (g)	A B	77.3	77.3	Minimum Value	0.0773 kg	
				Maximum Value	0.0862 kg	
	A M nonbreeding	86.2		Overall Study Average	0.0804 kg	
	A F nonbreeding	83.6	84.9			
	A M breeding	77.4				
	A F breeding	80.6	79			
Food Ingestion Rate (g/g-day)	B B free-living	0.89		*For Eating Mostly Fruit*		
				Conservative value:	0.0281 kg/day	Maximum ingestion rate * Average Body weight * 0.23[(1)]
	- B free-living	1.52				
				Average value	0.0223 kg/day	Average ingestion rate * Average Body weight * 0.23[(1)]
						[(1)] - 0.23 = percent solids in fruit to convert to a dry weight ingestion rate
	Overall Study Average		1.21			
				Based on Metabolic Scaling		
					0.01247 kg/day	Used maximum body weight in below equation
					0.01188 kg/day	Used average body weight in below equation
						Food ingestion rates were calculated from Nagy et al., (1999) for insectivores as follows: FI = (9.7*BW(g)$^{0.705}$)/18kJ/g/1000
Water Ingestion Rate (g/g-day)	A B	0.14		Conservative value:	0.012 L/day	Ingestion rate * Maximum Body weight
				Average value	0.011 L/day	Ingestion rate * Average Body weight
Short-Tailed Shrew						
Body Weight (g)	A B	15	15	Minimum Value	0.0150 kg	
				Maximum Value	0.01921 kg	
	M summer	19.21	17.27	Overall Study Average	0.01613 kg	
	F summer	17.4				
	M fall	16.87				
	M fall	15.58				
Food Ingestion Rate (g/g-day)	A B	0.49		Conservative value:	0.0016 kg/day	Maximum ingestion rate * Average Body weight * 0.16[(1)]
	A B	0.62		Average value	0.00143 kg/day	Average ingestion rate * Average Body weight * 0.16[(1)]
	Overall Study Average		0.555			[(1)] - 0.16 = percent solids in earthworms to convert to a dry weight ingestion rate
Water Ingestion Rate (g/g-day)	A B	0.223		Conservative value:	0.00428 L/day	Ingestion rate * Maximum Body weight
				Average value	0.00360 L/day	Ingestion rate * Average Body weight

APPENDIX P-2

DRY WEIGHT DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR TERRESTRIAL FOOD CHAIN MODELS
DUMP ROAD, LOCKHEED MARTIN, MARTIN STATE AIRPORT
MIDDLE RIVER, MARYLAND

Data from EPA (1993)				Derivation of Factors for Modeling			
Species/Factor	Age/Sex/ Cond./Seas.	Value	Study Average	Calculation of Values			Notes
Meadow Vole							
Body Weight (g)	A M summer	40	36.7	Minimum Value	0.017	kg	
	A F summer	33.4		Maximum Value	0.052	kg	
				Overall Study Average	0.0358	kg	
	A M spring	52.4	48.0				
	A F spring	43.5					
	A B spring	26	21.2				
	A B summer	24.3					
	A B fall	17					
	A B winter	17.5					
	A M	35.5	37.3				
	A F	39					
Food Ingestion Rate (g/g-day)		0.3	0.33	Conservative value:	0.001878	kg/day	Maximum ingestion rate * Average Body weight * 0.15 [(1)]
		0.35					
				Average value	0.001744	kg/day	Average ingestion rate * Average Body weight * 0.15[(1)]
							[(1)] - 0.15 = percent solids in plant foilage to convert to a dry weight ingestion rate
Water Ingestion Rate	A B	0.21	0.18	Conservative value:	0.007513	L/day	Maximum ingestion rate * Average Body weight
	A B	0.14		Average value	0.006261	L/day	Average ingestion rate * Average Body weight
Northern Bobwhite Quail							
Body Weight (g)	A B fall	189.9	191	Minimum Value	0.154	kg	
	A B winter	193.9		Maximum Value	0.194	kg	
	A B spring	190		Overall Study Average	0.1751	kg	
	A M winter	181	177				
	A M summer	163					
	A F winter	183					
	A F summer	180					
	A M winter	161	157				
	A M summer	154					
	A F winter	157					
	A F summer	157					
Food Ingestion Rate (g/g-day)	A B winter	0.093	0.078	Conservative value:	0.01628	kg/day	Maximum ingestion rate * Average Body weight
	A B spring	0.067					
	A B summer	0.079		Average value	0.01361	kg/day	Average ingestion rate * Average Body weight
	A B fall	0.072					
Water Ingestion Rate (g/g-day)	A M summer	0.1	0.11	Conservative value:	0.022762	L/day	Maximum ingestion rate * Average Body weight
	A F summer	0.13					
	A M summer	0.11		Average value	0.01926	L/day	Average ingestion rate * Average Body weight
	A F summer	0.1					

Notes:
A = Adult
F = Female, M = Male, B = Both
BW = Body Weight

APPENDIX L

SOIL TO PLANT AND EARTHWORM BIOACCUMULATION FACTORS

This attachment presents the bioaccumulation factors (BAFs) that were used in the food chain models. The following sources of BAFs were used in the ecological risk assessment for most of the chemicals:

- Plant and Soil Invertebrate BAFs: EPA Guidance for Developing Ecological Soil Screening Levels, Attachment 4-1 (USEPA, 2007).

- Plant BAF (mercury): Toxicity and Chemical-Specific Factors Database (ORNL, 2009).

- Soil Invertebrate BAF (mercury): Development and Validation of Bioaccumulation Models for Earthworms (Sample et al., 1998).

The BAF Table in this Appendix presents the BAFs that were used in the food-chain models. Note that dry weight BAFs were used for this ERA.

The EPA Guidance for Developing Ecological Soil Screening Levels (Eco SSLs) was the source of the BAFs for most of the chemicals. The majority of these BAFs are actually regression or BAF equations that are used to calculate the tissue concentration from the soil concentration.

References

ORNL. 2009. Toxicity and Chemical-Specific Factors Database. Oak Ridge National Laboratory Web Page, http://risk.lsd.ornl.gov/cgi-bin/tox/TOX_9801.

Sample, B.E., J.J. Beauchamp, R.A. Efroymson, G.W., Suter II, and T.L. Ashwood. 1998. Development and Validation of Bioaccumulation Models for Earthworms. Oak Ridge National Laboratory. June. ES/ER/TM-220.

USEPA, 2007. Guidance for Developing Ecological Soil Screening Levels Attachment 4-1. Office of Solid Waste and Emergency and Response. OSWER Directive 92857-55. February.

APPENDIX L-4

DRY WEIGHT BAFS FOR PLANTS AND EARTHWORMS
NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Plant Bioaccumulation Factors			Earthworm Bioaccumulation Factors		
	Conservative	Average		Conservative	Average	
Metals						
CHROMIUM	4.10E-02	4.10E-02	(1)	3.06E-01	3.06E-01	(1)
COPPER	Regression equation from Eco SSL		(1)	5.15E-01	5.15E-01	(1)
LEAD	Regression equation from Eco SSL		(1)	Regression equation from Eco SSL		(1)
MERCURY	1.00E+00	1.00E+00	(2)	Regression - Sample et al., (1998)		(3)
NICKEL	Regression equation from Eco SSL		(1)	1.06E+00	1.06E+00	(1)
SILVER	1.40E-02	1.40E-02	(1)	2.05E+00	2.05E+00	(1)
TIN	1.00E+00	1.00E+00		1.00E+00	1.00E+00	
VANADIUM	4.85E-03	4.85E-03	(1)	4.20E-02	4.20E-02	(1)
ZINC	Regression equation from Eco SSL		(1)	Regression equation from Eco SSL		(1)

- A default value of 1.0 was assigned to chemicals with unknown BAFs. No footnotes are listed by these values.
1 - USEPA (2007). Where "Regression equation from Eco-SSL" is given, tissue concentration will be calculated using regression equations from USEPA (2007), Attachment 4-1, Tables 4a (for inorganics). Value for nickel is from 2005 version of the Eco SSL Guidance Document (Attachment 4-1).
2 - ORNL Risk Assessment Information System (http://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chem)
3 - Sample et al., (February, 1998) conservative value is 90th percentile; average value is median value.

APPENDIX L-4

DRY WEIGHT BAFS FOR PLANTS AND EARTHWORMS
NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Plant Bioaccumulation Factors	Earthworm Bioaccumulation Factors

APPENDIX TABLE L-5

WILDLIFE TOXICITY REFERENCE VALUES
NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

PARAMETER	Mammal NOAEL	Mammal LOAEL	Bird NOAEL	Bird LOAEL
INORGANICS				
Chromium	2.40	58.17	2.66	15.63
Copper	5.6	82.7	4.05	34.87
Lead	4.7	186.4	1.63	44.63
Mercury	0.032	0.16	0.0064	0.064
Nickel	1.70	14.77	6.71	18.57
Silver	6.02	118.6	2.02	60.47
Tin	23.4	35	6.76	16.9
Vanadium	4.16	9.44	0.34	1.69
Zinc	75.4	297.58	66.1	171.44

Notes:

The sources of these NOAELS and LOAELS are presented in the table titled "Sources and Endpoints for NOAELS and LOAELS for Terrestrial Wildlife" in this appendix.

The NOAELS and LOAELS in the source table were divided by 10 if a subchronic study was the basis for the value. Also, if only a NOAEL was available, the value was multiplied by 10 to estimate the LOAEL. If only a LOAEL was available, the value was divided by 10 to estimate the NOAEL.

APPENDIX TABLE L-6

SOURCES AND ENDPOINTS FOR NOAELS AND LOAELS FOR TERRESTRIAL WILDLIFE
NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Parameters	Concentration (mg/kg-day)	Endpoint	Effect	Chronic/ Subchronic	Species	Primary Reference	Source of Reference
Inorganics							
Chromium(III)	15.63	LOAEL	reproduction & growth	chronic	birds	USEPA, 2008	
Chromium(III)	58.17	LOAEL	reproduction & growth	chronic	mammals	USEPA, 2008	
Chromium(III)	2.66	NOAEL	reproduction & growth	chronic	birds	USEPA, 2008	
Chromium(III)	2.4	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2008	
Copper	34.87	LOAEL	reproduction & growth	chronic	birds	USEPA, 2007	
Copper	82.7	LOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	
Copper	4.05	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007	
Copper	5.6	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	
Lead	44.6	LOAEL	reproduction & growth	chronic	birds	USEPA, 2005	
Lead	186.4	LOAEL	reproduction & growth	chronic	mammals	USEPA, 2005	
Lead	1.63	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005	
Lead	4.7	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005	
Mercury	0.064	LOAEL	reproductive	chronic	mallard duck	Heinz, 1979	Sample et.al., 1996
Mercury	0.16	LOAEL	reproductive	chronic	rat	Verschuuren et al., 1976	Sample et.al., 1996
Mercury	0.032	NOAEL	reproductive	chronic	rat	Verschuuren et al., 1976	Sample et.al., 1996
Nickel	18.57	LOAEL	reproduction & growth	chronic	birds	USEPA, 2007	
Nickel	14.77	LOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	
Nickel	6.71	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007	
Nickel	1.7	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	
Silver	60.47	LOAEL	reproduction & growth	chronic	birds	USEPA, 2006	
Silver	118.62	LOAEL	reproduction & growth	chronic	mammals	USEPA, 2006	
Silver	2.02	NOAEL	reproduction & growth	chronic	birds	USEPA, 2006	
Silver	6.02	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2006	
Tin	23.4	NOAEL	reproductive	chronic	mouse	Davis et al., 1987	Sample et.al., 1996
Tin	35	LOAEL	reproductive	chronic	mouse	Davis et al., 1987	Sample et.al., 1996
Tin	6.76	NOAEL	reproductive	chronic	Japanese quail	Schlatterer et al., 1993	Sample et.al., 1996
Tin	16.9	LOAEL	reproductive	chronic	Japanese quail	Schlatterer et al., 1993	Sample et.al., 1996
Vanadium	1.686	LOAEL	reproduction & growth	chronic	birds	USEPA, 2005	
Vanadium	9.436	LOAEL	reproduction & growth	chronic	mammals	USEPA, 2005	
Vanadium	0.344	NOAEL	reproduction & growth	chronic	birds	USEPA, 2005	
Vanadium	4.16	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2005	
Zinc	297.58	LOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	
Zinc	171.44	LOAEL	reproduction & growth	chronic	birds	USEPA, 2007	
Zinc	75.4	NOAEL	reproduction & growth	chronic	mammals	USEPA, 2007	
Zinc	66.1	NOAEL	reproduction & growth	chronic	birds	USEPA, 2007	

Notes:
NOAEL = No Observed Adverse Effects Level
LOAEL = Lowest Observed Adverse Effects Level
The LOAELs used for several metals were calculated as the geometric mean of growth and reproduction data from the Ecological Soil Screening Levels (U.S. EPA, 2005, 2006, 2007).
References for the NOAELS and LOAELs are presented in this Appendix and Titled "TRV Source and Endpoint References".

APPENDIX L

SOURCES AND ENPOINTS FOR NOAELS AND LOAELS FOR TERRESTRIAL WILDLIFE
NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

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APPENDIX L
TABLE 4-1

SURFACE SOIL FREQUENCY OF DETECTION
AIR BLAST POND (UXO-01)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

cas	parameter	utl95cv	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	lanl	reference	frequency	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c	max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
Explosives (mg/kg)																															
55-63-0	Nitroglycerin	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	3/39	1.1	1.2	1.1	1.2	0.09	0.14	0.09	0.14	J	J	0.09 - 0.14	1.1 - 1.2	X01SS0190006-D	0.108333	0.555769
Miscellaneous																															
TTNUS014	Cation Exchange Capacity (MEQ/kg)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		2/2	0	0	0	0	28.8	57.4	28.8	57.4			28.8 - 57.4	0	X01SS0110024	43.1	43.1
TTNUS288	Percent Moisture (%)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		2/2	0	0	0	0	17	17	17	17			17	0	X01SS0110024/X01SS0190006	17	17
TTNUS002	PH (s.u.)	8.8	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		2/2	0	0	0	0	4.18	4.53	4.18	4.53			4.18 - 4.53	0	X01SS0110024	4.355	4.355
TTNUS003	Total Organic Carbon (mg/kg)	57200	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		2/2	0	0	0	0	3340	6690	3340	6690			3340 - 6690	0	X01SS0190006	5015	5015
TTNUS046	**Total Solids (%)**	79.2	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA		2/2	0	0	0	0	83	83	83	83			83	0	X01SS0110024/X01SS0190006	83	83

Associated Samples:

X01SS0010006,NORMAL
X01SS0010024,NORMAL
X01SS0020006,NORMAL
X01SS0020024,NORMAL
X01SS0030006,NORMAL
X01SS0030024,NORMAL
X01SS0040006,NORMAL
X01SS0040024,NORMAL
X01SS0050006,NORMAL
X01SS0050024,NORMAL
X01SS0060006,NORMAL
X01SS0060024,NORMAL
X01SS0070006,NORMAL
X01SS0070024,NORMAL
X01SS0080006,NORMAL
X01SS0080024,NORMAL
X01SS0090006,NORMAL
X01SS0100006,NORMAL
X01SS0100024,NORMAL
X01SS0110006,NORMAL
X01SS0110024,NORMAL
X01SS0120006,NORMAL
X01SS0120024,NORMAL
X01SS0130006,NORMAL
X01SS0130024,NORMAL
X01SS0140006,NORMAL
X01SS0140024,NORMAL
X01SS0150006,NORMAL
X01SS0150024,NORMAL
X01SS0160006,NORMAL
X01SS0160024,NORMAL
X01SS0170006,NORMAL
X01SS0170024,NORMAL
X01SS0180006,NORMAL
X01SS0180024,DUP
X01SS0180024-AVG,AVG
X01SS0180024-D,DUP
X01SS0190006,DUP
X01SS0190006-AVG,AVG
X01SS0190006-D,DUP
X01SS0190024,NORMAL
X01SS0200006,NORMAL
X01SS0200024,NORMAL

APPENDIX L
TABLE 5-1

TERRESTRIAL FOOD CHAIN MODEL - CONSERVATIVE SCENARIO
INSECTIVOROUS AND HERBIVOROUS RECEPTORS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Herbivorous Receptors EEQs				Insectivorous Receptors EEQs			
	Bobwhite Quail		Meadow Vole		American Robin		Short-Tailed Shrew	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics								
COPPER	5.0E-01	5.8E-02	2.4E-01	1.6E-02	1.8E+00	2.1E-01	6.8E-01	4.6E-02
LEAD	8.4E-01	3.1E-02	1.2E-01	3.1E-03	3.7E+00	1.3E-01	6.3E-01	1.6E-02
MERCURY	6.0E+00	6.0E-01	1.1E+00	2.3E-01	2.0E+01	2.0E+00	2.5E+00	5.0E-01
TIN	2.9E-03	1.2E-03	2.2E-04	1.5E-04	3.6E-02	1.4E-02	6.1E-03	4.1E-03
VANADIUM	1.5E+00	3.1E-01	3.4E-02	1.5E-02	3.3E+00	6.8E-01	6.3E-02	2.8E-02
ZINC	8.1E-02	3.1E-02	6.6E-02	1.7E-02	7.9E-01	3.0E-01	4.5E-01	1.1E-01

Cells are shaded if the value is greater than 1.0

NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
EEQ - Ecological Effects Quotient

APPENDIX L
TABLE 5-2

TERRESTRIAL FOOD CHAIN MODEL - CONSERVATIVE SCENARIO
INSECTIVOROUS AND HERBIVOROUS RECEPTORS
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Herbivorous Receptors EEQs				Insectivorous Receptors EEQs			
	Bobwhite Quail		Meadow Vole		American Robin		Short-Tailed Shrew	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics								
COPPER	1.0E-01	1.2E-02	4.1E-02	2.8E-03	1.9E-01	2.2E-02	7.6E-02	5.1E-03
LEAD	1.1E-01	4.2E-03	1.6E-02	4.0E-04	8.4E-01	3.1E-02	1.6E-01	4.0E-03
MERCURY	5.7E-01	5.7E-02	6.8E-02	1.4E-02	8.8E+00	8.8E-01	1.1E+00	2.1E-01
VANADIUM	2.6E-01	5.4E-02	3.5E-03	1.5E-03	8.0E-01	1.6E-01	1.9E-02	8.5E-03

Cells are shaded if the value is greater than 1.0
Only chemicals with EEQs > 1.0 in the conservative food chain model are presented in this table.

NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
EEQ - Ecological Effects Quotient

APPENDIX L
TABLE 5-3

SEDIMENT COPC SELECTION
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Location of Maximum Concentration (1)	Average of Positive Results(1)	Average of All Results(1)	Background 95% UCL	Ecological Screening Level(2)	Ecological Effects Quotient (3)	Maximum Greater than Background ?	COPC for Aquatic Biota	Rationale for Invertebrate/ Plant Deletion or Selection
Inorganics (mg/kg)												
Aluminum	7/7	4650	26800 J	X02SD005	18114	18114	52362	NA	NA	NO	NO	BKG
Arsenic	7/7	1.3	7.3	X02SD003-D	3.27	3.27	63	9.8	0.74	NO	NO	BKG
Barium	7/7	37.3 K	124 K	X02SD005	95.9	95.9	577	48	2.58	NO	NO	BKG
Beryllium	7/7	0.24 J	2.3	X02SD002	1.075	1.075	10.9	NA	NA	NO	NO	BKG
Cadmium	6/7	0.52	1.2	X02SD002	0.95	0.82	1.85	0.99	1.21	NO	NO	BKG
Calcium	7/7	139	5710	X02SD002	1921	1921	88137	NA	NA	NO	NO	NUT
Chromium	7/7	7.7 K	31.5 K	X02SD006	21.1	21.1	79.2	43.4	0.73	NO	NO	BKG
Cobalt	7/7	2.8	43.1	X02SD002	11.8	11.8	118	50	0.86	NO	NO	BKG
Copper	7/7	5.3	41.6	X02SD005	25.0	25.0	297	31.6	1.32	NO	NO	BKG
Iron	7/7	3760	17300	X02SD002	9790	9790	193218	20000	0.87	NO	NO	BKG
Lead	7/7	9.4	48.8	X02SD002	35.75	35.75	476	35.8	1.36	NO	NO	BKG
Lithium	7/7	5.6	20.2	X02SD006	14.5	14.5	NA	NA	NA	NA	YES	NSL
Magnesium	7/7	398 K	2250 K	X02SD002	1227	1227	19043	NA	NA	NO	NO	NUT
Manganese	7/7	31.4	234	X02SD002	85.4	85.4	2561	460	0.51	NO	NO	BKG
Mercury	7/7	0.071	0.42	X02SD007	0.21	0.21	0.778	0.18	2.33	NO	NO	BKG
Nickel	7/7	6.3	37.1	X02SD002	19.1	19.1	382	22.7	1.63	NO	NO	BKG
Potassium	7/7	698 K	1490 K	X02SD006	1105	1105	5061	NA	NA	NO	NO	NUT
Selenium	7/7	0.16	1.3 L	X02SD003-D	0.73	0.73	6.45	2	0.65	NO	NO	BKG
Silver	1/7	0.085 J	0.11 J	X02SD003-D	0.10	0.05	0.92	1	0.11	NO	NO	BKG
Sodium	7/7	23 J	763	X02SD002	253	253	472	NA	NA	YES	NO	NUT
Strontium	7/7	5.2 K	50.6 K	X02SD002	19.4	19.4	NA	NA	NA	NA	YES	NSL
Tin	6/7	1 J	2 J	X02SD002	1.35	1.22	NA	3.4	0.59	NA	NO	BSL
Vanadium	7/7	12.5 K	53.1 K	X02SD002	34.9	34.9	196	57	0.93	NO	NO	BKG
Zinc	7/7	17.7	215	X02SD002	92.7	92.7	1660	121	1.78	NO	NO	BKG

1 - Sample and duplicate were considered as two separate samples when determining the minimum and maximum concentrations, but were averaged and considered one sample for average calculations.
2 - The Ecological Screening Levels for sediment in order of preference are:
USEPA Region 3 Freshwater Screening Levels (USEPA, 2006)
NOAA Screening Quick Reference Tables (Buchman, 2008)
3 - Ecological effects quotients were calculated by dividing the maximum detected concentration by the ecological screening level. Values are unitless.

Associated Samples:

X02SD001,NORMAL	X02SD003-AVG,AVG	X02SD005,NORMAL
X02SD002,NORMAL	X02SD003-D,DUP	X02SD006,NORMAL
X02SD003,DUP	X02SD004,NORMAL	X02SD007,NORMAL

APPENDIX L
TABLE 5-4

SURFACE SOIL COPC SELECTION
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Location of Maximum Concentration (1)	Average of Positive Results(1)	Average of All Results(1)	Background 95% UCL	Ecological Effects Quotient(2)				Maximum Greater than Background?	Rationale for Invertebrate/Plant Deletion or Selection	Retain for Food Chain Modeling?
								Invertebrates(3)	Plants(3)	Avian(4)	Mammals(4)			
Explosives (mg/kg)														
1,3-Dinitrobenzene	2/40	0.028 J	0.05 J	X02SS0280006	0.039	0.0967	NA	NA	NA	NA	NA	NA	NSL	NO
Nitroglycerin	1/40	0.17 J	0.17 J	X02SS0400006	0.17	0.58675	NA	NA	NA	NA	NA	NA	NSL	NO
Inorganics (mg/kg)														
Aluminum	40/40	2570	13900 J	X02SS0090006	8370.5	8370.5	19700	pH	pH	pH	pH	NO	BKG	NO
Antimony	26/40	0.034 J	0.17 L	X02SS0010006	0.057279	0.049569	NA	0.002	0.03	NA	0.6	NA	BSL	NO
Arsenic	40/40	0.8 J	4.5 J	X02SS0210006	1.9325	1.9325	14.9	0.08	0.25	0.10	0.10	NO	BKG/BSL	NO
Barium	40/40	14.3 K	95.8 K	X02SS0090006	37.13875	37.13875	80.4	0.29	0.19	0.22	0.05	YES	BSL	NO
Beryllium	36/40	0.17 J	0.99	X02SS0090006	0.365	0.336625	1.1	0.02	0.1	NA	0.05	NO	BKG/BSL	NO
Cadmium	1/40	0.11 J	0.11 J	X02SS0010006	0.11	0.042681	2.5	0.001	0.003	0.14	0.31	NO	BKG/BSL	NO
Calcium	40/40	57.6 K	20300 K	X02SS0180006	763.49	763.49	2060	NA	NA	NA	NA	YES	NUT	NO
Chromium	40/40	4.4 K	20.6	X02SS0300006	10.12625	10.12625	33.4	0.32	0.32	0.79	0.61	NO	BKG/BSL	NO
Cobalt	40/40	1.1	12.8	X02SS0090006	4.205	4.205	22.3	0.06	0.98	0.11	0.06	NO	BKG/BSL	NO
Copper	40/40	2	65.5	X02SS0190006	9.10375	9.10375	20.3	0.82	0.94	2.3	1.3	YES	BSL	YES
Iron	40/40	3460	15100	X02SS0090006	8015	8015	38500	NA	NA	pH	NA	NO	BKG	NO
Lead	40/40	6.1	72.1	X02SS0090006	17.7275	17.7275	62.5	0.04	0.6	6.6	1.3	YES	BSL	YES
Lithium	40/40	1.7	12.8	X02SS0090006	5.215	5.215	NA	NA	6.4	NA	NA	NA	ASL/NSL	NO
Magnesium	40/40	191 K	11700 K	X02SS0180006	783.5875	783.5875	1620	NA	NA	NA	NA	YES	NUT	NO
Manganese	40/40	21.4 K	605 J	X02SS0320006	149.8975	149.8975	1390	1.3444	2.7500	0.14	0.15	NO	BKG	NO
Mercury	40/40	0.013 J	0.32 L	X02SS0190006	0.04405	0.04405	0.16	0.03	0.03	5.5	0.20	YES	BSL	YES
Nickel	40/40	2.8	21.8	X02SS0300006	6.84875	6.84875	15.4	0.08	0.57	0.10	0.17	YES	BSL	NO
Potassium	40/40	242 K	1070 K	X02SS0400006	554.125	554.125	1470	NA	NA	NA	NA	NO	NUT	NO
Silver	1/40	0.12 J	0.12 J	X02SS0090006	0.12	0.042956	0.84	NA	0.0002	0.03	0.01	NO	BKG/BSL	NO
Sodium	37/40	9.1 J	90.8	X02SS0300006	20.940541	19.67625	120	NA	NA	NA	NA	NO	NUT	NO
Strontium	40/40	1.9 K	11.3 K	X02SS0320006	4.45375	4.45375	NA	0.09	0.09	0.09	0.09	NA	BSL	NO
Tin	6/40	0.83 J	1.3 J	X02SS0300006	0.985	0.496875	NA	1.5	0.03	1.5	0.17	NA	ASL	YES
Vanadium	40/40	9.3 K	34.3 K	X02SS0090006	17.67125	17.67125	53.3	0.26	0.26	4.4	0.12	NO	BKG/BSL	YES
Zinc	40/40	8.2	52.7	X02SS0090006	18.99375	18.99375	37.5	0.44	0.33	1.1	0.67	YES	BSL	YES

-shading of the chemical name indicates the chemical was retianed as a COPC for soil invertebrates or plants.

1 - Sample and duplicate were considered as two separate samples when determining the minimum and maximum concentrations, but were averaged and considered one sample for average calculations.

2 - Ecological effects quotients were calculated by dividing the maximum detected concentration by the COPC screening level. Values are unitless. The screening levels are provided in Appendix L Table titled "Soil Ecological Screening Levels"

3 - Cells are shaded for plants/invertebrates if the EEQ > 1; the chemical was retained as a COPC for plants/invertebrates if the maximum concentration is > background and the EEQ > 1 or a screening level was not available for that receptor.

4 - Shading for wildlife receptors indicates that the chemical exceded the screening level and was retained for food chain modeling if the maximum concentration was also greater than background. If a screening level was not available for wildlife receptors, the chemical was not retained for food chain modeling unless it is considered to be an important bioaccumulative chemical as indicated in USEPA (2006) or the chemical was retained for the other wildlife receptor.

Rationale Codes
For Selection as a COPC:
ASL = Above COPC screening level
NSL = No screening level
For Elimination as a COPC:
BSL = Below COPC screening level
NUT = Essential nutrient
BKG = Maximum less than Background

Associated Samples:

X02SS0010006,NORMAL	X02SS0060006,NORMAL	X02SS0130006,NORMAL	X02SS0200006,NORMAL	X02SS0260006-AVG,AVG	X02SS0320006,NORMAL	X02SS0370006,NORMAL
X02SS0020006,NORMAL	X02SS0070006,NORMAL	X02SS0140006,NORMAL	X02SS0210006,NORMAL	X02SS0260006-D,DUP	X02SS0330006,DUP	X02SS0380006,NORMAL
X02SS0030006,NORMAL	X02SS0080006,NORMAL	X02SS0150006,NORMAL	X02SS0220006,NORMAL	X02SS0270006,NORMAL	X02SS0330006-AVG,AVG	X02SS0390006,NORMAL
X02SS0040006,NORMAL	X02SS0090006,NORMAL	X02SS0160006,NORMAL	X02SS0230006,NORMAL	X02SS0280006,NORMAL	X02SS0330006-D,DUP	X02SS0400006,NORMAL
X02SS0050006,DUP	X02SS0100006,NORMAL	X02SS0170006,NORMAL	X02SS0240006,NORMAL	X02SS0290006,NORMAL	X02SS0340006,NORMAL	
X02SS0050006-AVG,AVG	X02SS0110006,NORMAL	X02SS0180006,NORMAL	X02SS0250006,NORMAL	X02SS0300006,NORMAL	X02SS0350006,NORMAL	
X02SS0050006-D,DUP	X02SS0120006,NORMAL	X02SS0190006,NORMAL	X02SS0260006,DUP	X02SS0310006,NORMAL	X02SS0360006,NORMAL	

APPENDIX L
TABLE 5-5

GROUNDWATER FREQUENCY OF DETECTION
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	minorpal	ornltap	ornltap_b	mcl	mde	reference	frequency	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c	max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
Inorganics (ug/L)																							
7429-90-5	**Aluminum**	50	3700	N	50	50	MDE Cleanup Standard	6/6	0	0	0	0	60	4300	60	4300	J		60 - 4300	0	X02GW005	884.25	884.25
7440-38-2	**Arsenic**	0.045	0.045	C	10	10	ORNL-R	2/6	1	1	1	1	1.4	2.2	1.4	2.2	K	K	1.4 - 2.2	1	X02GW005	1.8	0.933333
7440-39-3	Barium	730	730	N	2000	2000	ORNL-R	6/6	0	0	0	0	20	80	20	80		J	20 - 80	0	X02GW001-D	39.083333	39.083333
7440-41-7	Beryllium	4	7.3	N	4	4	MDE Cleanup Standard	1/6	0.3	0.3	0.3	0.3	0.32	0.32	0.32	0.32	J	J	0.32	0.3	X02GW001-D	0.235	0.164167
7440-43-9	Cadmium	1.8	1.8	N	5	5	ORNL-R	1/6	0.37	0.37	0.37	0.37	0.38	0.38	0.38	0.38	J	J	0.38	0.37	X02GW001-D	0.2825	0.20125
7440-70-2	Calcium	NA	NA		NA	NA	NA	6/6	0	0	0	0	420	2600	420	2600			420 - 2600	0	X02GW004	1528.333333	1528.333333
7440-47-3	Chromium	100	5500	N	100	100	MDE Cleanup Standard	2/6	2	2	2	2	5.7	6.7	5.7	6.7	J		5.7 - 6.7	2	X02GW001	4.775	2.258333
7440-48-4	**Cobalt**	1.1	1.1	N	NA	NA	ORNL-R	3/6	2	2	2	2	3.1	16	3.1	16	J		3.1 - 16	2	X02GW001	6.033333	3.516667
7440-50-8	Copper	150	150	N	1300	1300	ORNL-R	3/6	3.6	6.3	3.6	6.3	6.7	22	6.7	22	J		6.7 - 22	3.6 - 6.3	X02GW004	11.216667	6.766667
7439-89-6	**Iron**	300	2600	N	300	300	MDE Cleanup Standard	6/6	0	0	0	0	63	5300	63	5300	J	J	63 - 5300	0	X02GW005	1300.416667	1300.416667
7439-92-1	Lead	15	NA		15	15	MDE Cleanup Standard	1/6	2.2	2.2	2.2	2.2	3	3	3	3	J	J	3	2.2	X02GW006	3	1.416667
7439-95-4	Magnesium	NA	NA		NA	NA	NA	6/6	0	0	0	0	720	4300	720	4300	J	J	720 - 4300	0	X02GW001-D	1336.666667	1336.666667
7439-96-5	**Manganese**	50	88	N	50	50	MDE Cleanup Standard	6/6	0	0	0	0	8.3	150	8.3	150	J	J	8.3 - 150	0	X02GW002	61.133333	61.133333
7440-02-0	Nickel	73	73	N	NA	73	MDE Cleanup Standard	1/6	7.3	7.3	7.3	7.3	9.7	22	9.7	22	J		9.7 - 22	7.3	X02GW001-D	15.85	5.683333
7440-09-7	Potassium	NA	NA		NA	NA	NA	6/6	0	0	0	0	790	2900	790	2900			790 - 2900	0	X02GW001-D	1440	1440
7782-49-2	Selenium	18	18	N	50	50	ORNL-R	4/6	3.5	3.9	3.5	3.9	3.5	4.1	3.5	4.1	J	J	3.5 - 4.1	3.5 - 3.9	X02GW001-D	3.85	3.183333
7782-49-2	Selenium	18	18	N	50	50	ORNL-R	4/6	3.5	3.9	3.5	3.9	3.5	4.1	3.5	4.1	J	J	3.5 - 4.1	3.5 - 3.9	X02GW003	3.85	3.183333
7440-23-5	Sodium	NA	NA		NA	NA	NA	6/6	0	0	0	0	2600	6200	2600	6200			2600 - 6200	0	X02GW001-D	3833.333333	3833.333333
7440-24-6	Strontium	2200	2200	N	NA	NA	ORNL-R	6/6	0	0	0	0	8	21	8	21			8 - 21	0	X02GW004	13	13
7440-62-2	**Vanadium**	3.7	18	N	NA	3.7	MDE Cleanup Standard	2/6	2	2	2	2	6	10	6	10	J		6 - 10	2	X02GW005	6.75	2.916667
7440-66-6	Zinc	1100	1100	N	5000	5000	ORNL-R	5/6	7.3	7.3	7.3	7.3	8.9	50	8.9	50	J		8.9 - 50	7.3	X02GW001-D	21.68	18.675
Inorganics, Filtered (ug/L)																							
7429-90-5	**Aluminum, Dissolved**	50	3700	N	50	50	MDE Cleanup Standard	2/3	26	26	26	26	63	240	63	240	J	J	63 - 240	26	X02GW001-D	126.5	88.666667
7440-36-0	Antimony, Dissolved	1.5	1.5	N	6	6	ORNL-R	1/3	0.66	0.66	0.66	0.66	0.71	0.71	0.71	0.71	J	J	0.71	0.66	X02GW001-D	0.52	0.393333
7440-38-2	**Arsenic, Dissolved**	0.045	0.045	C	10	10	ORNL-R	1/3	1	1	1	1	1.2	1.2	1.2	1.2	J	J	1.2	1	X02GW005	1.2	0.733333
7440-39-3	Barium, Dissolved	730	730	N	2000	2000	ORNL-R	3/3	0	0	0	0	16	28	16	28			16 - 28	0	X02GW005	21.333333	21.333333
7440-70-2	Calcium, Dissolved	NA	NA		NA	NA	NA	3/3	0	0	0	0	1100	1400	1100	1400			1100 - 1400	0	X02GW006	1233.333333	1233.333333
7440-47-3	Chromium, Dissolved	100	5500	N	100	100	MDE Cleanup Standard	1/3	1.6	1.6	1.6	1.6	4.8	4.8	4.8	4.8	J	J	4.8	1.6	X02GW001	2.8	1.466667
7440-48-4	**Cobalt, Dissolved**	1.1	1.1	N	NA	NA	ORNL-R	3/3	0	0	0	0	3	16	3	16	J		3 - 16	0	X02GW001-D	7.8	7.8
7440-50-8	Copper, Dissolved	150	150	N	1300	1300	ORNL-R	1/3	3.3	3.3	3.3	3.3	4.2	4.8	4.2	4.8	J	J	4.2 - 4.8	3.3	X02GW001	4.5	2.6
7439-89-6	**Iron, Dissolved**	300	2600	N	300	300	MDE Cleanup Standard	3/3	0	0	0	0	250	3600	250	3600	J		250 - 3600	0	X02GW005	1566.666667	1566.666667
7439-95-4	Magnesium, Dissolved	NA	NA		NA	NA	NA	3/3	0	0	0	0	550	760	550	760			550 - 760	0	X02GW006	695	695
7439-96-5	Manganese, Dissolved	50	88	N	50	50	MDE Cleanup Standard	3/3	0	0	0	0	37	49	37	49			37 - 49	0	X02GW005	44.666667	44.666667
7439-97-6	Mercury, Dissolved	1.1	1.1	N	2	2	ORNL-R	1/3	0.066	0.066	0.066	0.066	0.37	0.37	0.37	0.37			0.37	0.066	X02GW001-D	0.2015	0.089167
7440-02-0	Nickel, Dissolved	73	73	N	NA	73	MDE Cleanup Standard	1/3	6.6	6.6	6.6	6.6	11	11	11	11	J	J	11	6.6	X02GW001	11	5.866667
7440-02-0	Nickel, Dissolved	73	73	N	NA	73	MDE Cleanup Standard	1/3	6.6	6.6	6.6	6.6	11	11	11	11	J	J	11	6.6	X02GW001-D	11	5.866667
7440-09-7	Potassium, Dissolved	NA	NA		NA	NA	NA	3/3	0	0	0	0	880	2000	880	2000			880 - 2000	0	X02GW001	1260	1260
7440-23-5	Sodium, Dissolved	NA	NA		NA	NA	NA	3/3	0	0	0	0	3500	4400	3500	4400			3500 - 4400	0	X02GW005	3866.666667	3866.666667
7440-24-6	Strontium, Dissolved	2200	2200	N	NA	NA	ORNL-R	3/3	0	0	0	0	7.9	10	7.9	10			7.9 - 10	0	X02GW006	9.216667	9.216667
7440-62-2	Vanadium, Dissolved	3.7	18	N	NA	3.7	MDE Cleanup Standard	1/3	1.6	1.6	1.6	1.6	3.5	3.5	3.5	3.5	J	J	3.5	1.6	X02GW001	2.15	1.25
7440-66-6	Zinc, Dissolved	1100	1100	N	5000	5000	ORNL-R	1/3	6.6	6.6	6.6	6.6	8	9.6	8	9.6	J	J	8 - 9.6	6.6	X02GW001	8.8	5.133333

Associated Samples:

X02GW001,DUP
X02GW001-AVG,AVG
X02GW001-D,DUP
X02GW002,NORMAL
X02GW003,NORMAL
X02GW004,NORMAL
X02GW005,NORMAL
X02GW006,NORMAL

APPENDIX L
TABLE 5-6

SEDIMENT FREQUENCY OF DETECTION
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	utl95	minorpal	ornl	ornl_b	r3btag	tec	noaa	sunhar	reference	frequency	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c	max_c	min_qual	max_qual
Inorganics (mg/kg)																					
7429-90-5	Aluminum	52362	77000	77000	N	NA	NA	NA	NC	ORNL-R	7/7	0	0	0	0	4650	26800	4650	26800		J
7440-38-2	Arsenic	63	3.9	3.9	C	9.8	NC	NC	NC	ORNL-R	7/7	0	0	0	0	1.3	7.3	1.3	7.3		
7440-39-3	Barium	577	48	15000	N	NA	NA	48	NC	NOAA SQUIRT	7/7	0	0	0	0	37.3	124	37.3	124	K	K
7440-41-7	Beryllium	10.9	160	160	N	NA	NA	NA	NC	ORNL-R	7/7	0	0	0	0	0.24	2.3	0.24	2.3	J	
7440-43-9	Cadmium	1.85	0.99	70	N	0.99	NC	NC	NC	R3BTAG	6/7	0.082	0.082	0.082	0.082	0.52	1.2	0.52	1.2		
7440-70-2	Calcium	88137	NA	NA		NA	NA	NA	NC	ORNL-R	7/7	0	0	0	0	139	5710	139	5710		
7440-47-3	Chromium	79.2	43.4	12000		43.4	NC	NC	NC	R3BTAG	7/7	0	0	0	0	7.7	31.5	7.7	31.5	K	K
7440-48-4	Cobalt	118	23	23	N	50	NC	NC	NC	ORNL-R	7/7	0	0	0	0	2.8	43.1	2.8	43.1		
7440-50-8	Copper	297	31.6	3100	N	31.6	NC	NC	NC	R3BTAG	7/7	0	0	0	0	5.3	41.6	5.3	41.6		
7439-89-6	Iron	193218	20000	55000	N	20000	NC	NC	NC	R3BTAG	7/7	0	0	0	0	3760	17300	3760	17300		
7439-92-1	Lead	476	35.8	400		35.8	NC	NC	NC	R3BTAG	7/7	0	0	0	0	9.4	48.8	9.4	48.8		
7439-93-2	Lithium	NA	160	160	N	NA	NA	NA	NC	ORNL-R	7/7	0	0	0	0	5.6	20.2	5.6	20.2		
7439-95-4	Magnesium	19043	NA	NA		NA	NA	NA	NC	ORNL-R	7/7	0	0	0	0	398	2250	398	2250	K	K
7439-96-5	Manganese	2561	460	1800	N	460	NC	NC	NC	R3BTAG	7/7	0	0	0	0	31.4	234	31.4	234		
7439-97-6	Mercury	0.778	0.18	23	N	0.18	NC	NC	NC	R3BTAG	7/7	0	0	0	0	0.071	0.42	0.071	0.42		
7440-02-0	Nickel	382	22.7	1500	N	22.7	NC	NC	NC	R3BTAG	7/7	0	0	0	0	6.3	37.1	6.3	37.1		
7440-09-7	Potassium	5061	NA	NA		NA	NA	NA	NC	ORNL-R	7/7	0	0	0	0	698	1490	698	1490	K	K
7782-49-2	Selenium	6.45	2	390	N	2	NC	NC	NC	R3BTAG	7/7	0	0	0	0	0.16	1.3	0.16	1.3		L
7440-22-4	Silver	0.92	1	390	N	1	NC	NC	NC	R3BTAG	1/7	0.081	0.083	0.081	0.083	0.085	0.11	0.085	0.11	J	J
7440-23-5	Sodium	472	NA	NA		NA	NA	NA	NC	ORNL-R	7/7	0	0	0	0	23	763	23	763	J	
7440-24-6	Strontium	NA	47000	47000	N	NA	NA	NA	NC	ORNL-R	7/7	0	0	0	0	5.2	50.6	5.2	50.6	K	K
7440-31-5	Tin	NA	3.4	47000	N	NA	NA	3.4	NC	NOAA SQUIRT	6/7	0.82	0.82	0.82	0.82	1	2	1	2	J	J
7440-62-2	Vanadium	196	57	390	N	NA	NA	57	NC	NOAA SQUIRT	7/7	0	0	0	0	12.5	53.1	12.5	53.1	K	K
7440-66-6	Zinc	1660	121	23000	N	121	NC	NC	NC	R3BTAG	7/7	0	0	0	0	17.7	215	17.7	215		

Associated Samples:

X02SD001,NORMAL
X02SD002,NORMAL
X02SD003,DUP
X02SD003-AVG,AVG
X02SD003-D,DUP
X02SD004,NORMAL
X02SD005,NORMAL
X02SD006,NORMAL
X02SD007,NORMAL

NO EXCEEDANCES ABOVE PAL AND BACKGROUND
PAL EXCEEDANCES FELL BELOW BACKGROUND

APPENDIX L
TABLE 5-6

SEDIMENT FREQUENCY OF DETECTION
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

range	range_nd	samp_max	avg_pos	avg_all
4650 - 26800	0	X02SD005	18114.28571	18114.28571
1.3 - 7.3	0	X02SD003-D	3.271429	3.271429
37.3 - 124	0	X02SD005	95.921429	95.921429
0.24 - 2.3	0	X02SD002	1.075	1.075
0.52 - 1.2	0.082	X02SD002	0.95	0.820143
139 - 5710	0	X02SD002	1921.142857	1921.142857
7.7 - 31.5	0	X02SD006	21.064286	21.064286
2.8 - 43.1	0	X02SD002	11.778571	11.778571
5.3 - 41.6	0	X02SD005	24.985714	24.985714
3760 - 17300	0	X02SD002	9790	9790
9.4 - 48.8	0	X02SD002	35.75	35.75
5.6 - 20.2	0	X02SD006	14.485714	14.485714
398 - 2250	0	X02SD002	1226.714286	1226.714286
31.4 - 234	0	X02SD002	85.4	85.4
0.071 - 0.42	0	X02SD007	0.206571	0.206571
6.3 - 37.1	0	X02SD002	19.128571	19.128571
698 - 1490	0	X02SD006	1105.214286	1105.214286
0.16 - 1.3	0	X02SD003-D	0.729286	0.729286
0.085 - 0.11	0.081 - 0.083	X02SD003-D	0.0975	0.049286
23 - 763	0	X02SD002	252.657143	252.657143
5.2 - 50.6	0	X02SD002	19.357143	19.357143
1 - 2	0.82	X02SD002	1.35	1.215714
12.5 - 53.1	0	X02SD002	34.907143	34.907143
17.7 - 215	0	X02SD002	92.714286	92.714286

APPENDIX L
TABLE 5-7

SURFACE SOIL FREQUENCY OF DETECTION
AREA 8 (USO-02)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	frequency	min_ndc	max_ndc
Explosives (mg/kg)																
99-65-0	1,3-Dinitrobenzene	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	2/80	0.19	0.2
98-95-3	**Nitrobenzene**	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	1/80	0.19	0.2
55-63-0	Nitroglycerin	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	2/80	1.1	1.2
Inorganics (mg/kg)																
7429-90-5	Aluminum	19700	7700	7700	7800	NA	10	NC	NC	NC	NC	NC	NC	80/80	0	0
7440-36-0	Antimony	NA	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	40/80	0.032	0.1
7440-38-2	Arsenic	14.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	80/80	0	0
7440-39-3	Barium	80.4	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	80/80	0	0
7440-41-7	Beryllium	1.1	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	74/80	0.16	0.17
7440-43-9	Cadmium	2.5	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	1/80	0.079	0.16
7440-70-2	Calcium	2060	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	80/80	0	0
7440-47-3	**Chromium**	33.4	26	12000	12000	2000000000	26	NC	NC	NC	NC	NC	NC	80/80	0	0
7440-48-4	Cobalt	22.3	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	80/80	0	0
7440-50-8	**Copper**	20.3	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	80/80	0	0
7439-89-6	Iron	38500	5500	5500	5500	NA	11	NC	NC	NC	NC	NC	NC	80/80	0	0
7439-92-1	**Lead**	62.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	80/80	0	0
7439-93-2	**Lithium**	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	80/80	0	0
7439-95-4	**Magnesium**	1620	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	80/80	0	0
7439-96-5	Manganese	1390	160	180	160	950	220	NC	NC	NC	NC	NC	NC	80/80	0	0
7439-97-6	**Mercury**	0.16	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	80/80	0	0
7440-02-0	Nickel	15.4	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	80/80	0	0
7440-09-7	Potassium	1470	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	80/80	0	0
7782-49-2	Selenium	1.2	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	60/80	0.032	0.065
7440-22-4	Silver	0.84	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	1/80	0.079	0.16
7440-23-5	Sodium	120	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	74/80	8.1	8.3
7440-24-6	Strontium	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	80/80	0	0
7440-31-5	**Tin**	NA	0.89	4700	4700	NA	NA	0.89	NC	NC	NC	NC	NC	8/80	0.8	1.6
7440-62-2	Vanadium	53.3	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	80/80	0	0
7440-66-6	**Zinc**	37.5	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	80/80	0	0
Miscellaneous Parameters																
TTNUS014	Cation Exchange Capacity (MEQ/kg)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1/1	0	0
TTNUS288	Percent Moisture (%)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1/1	0	0
TTNUS002	PH (s.u.)	8.8	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1/1	0	0
TTNUS003	Total Organic Carbon (mg/kg)	57200	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1/1	0	0
TTNUS046	**Total Solids (%)**	79.2	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1/1	0	0

Associated Samples:

X02SS0010006,NORMAL
X02SS0010024,NORMAL
X02SS0020006,NORMAL
X02SS0020024,NORMAL
X02SS0030006,NORMAL
X02SS0030024,NORMAL
X02SS0040006,NORMAL
X02SS0040024,NORMAL
X02SS0050006,DUP
X02SS0050006-AVG,AVG
X02SS0050006-D,DUP
X02SS0050024,NORMAL
X02SS0060006,NORMAL
X02SS0060024,NORMAL
X02SS0070006,NORMAL
X02SS0070024,NORMAL
X02SS0080006,NORMAL
X02SS0080024,NORMAL
X02SS0090006,NORMAL
X02SS0090024,NORMAL
X02SS0100006,NORMAL
X02SS0100024,NORMAL
X02SS0110006,NORMAL
X02SS0110024,NORMAL
X02SS0120006,NORMAL
X02SS0120024,NORMAL
X02SS0130006,NORMAL
X02SS0130024,NORMAL
X02SS0140006,NORMAL
X02SS0140024,NORMAL
X02SS0150006,NORMAL
X02SS0150024,NORMAL
X02SS0160006,NORMAL
X02SS0160024,NORMAL
X02SS0170006,NORMAL
X02SS0170024,NORMAL
X02SS0180006,NORMAL
X02SS0180024,NORMAL
X02SS0190006,NORMAL
X02SS0190024,NORMAL
X02SS0200006,NORMAL
X02SS0200024,NORMAL
X02SS0210006,NORMAL
X02SS0210024,NORMAL
X02SS0220006,NORMAL
X02SS0220024,NORMAL
X02SS0230006,NORMAL
X02SS0230024,NORMAL
X02SS0240006,NORMAL
X02SS0240024,DUP
X02SS0240024-AVG,AVG
X02SS0240024-D,DUP
X02SS0250006,NORMAL
X02SS0250024,NORMAL
X02SS0260006,DUP
X02SS0260006-AVG,AVG
X02SS0260006-D,DUP
X02SS0260024,NORMAL
X02SS0270006,NORMAL
X02SS0270024,NORMAL
X02SS0280006,NORMAL
X02SS0280024,NORMAL
X02SS0290006,NORMAL
X02SS0290024,NORMAL
X02SS0300006,NORMAL
X02SS0300024,NORMAL
X02SS0310006,NORMAL
X02SS0310024,NORMAL
X02SS0320006,NORMAL
X02SS0320024,NORMAL
X02SS0330006,DUP
X02SS0330006-AVG,AVG
X02SS0330006-D,DUP
X02SS0330024,NORMAL
X02SS0340006,NORMAL
X02SS0340024,NORMAL
X02SS0350006,NORMAL
X02SS0350024,NORMAL
X02SS0360006,NORMAL
X02SS0360024,NORMAL
X02SS0370006,NORMAL
X02SS0370024,NORMAL
X02SS0380006,NORMAL
X02SS0380024,NORMAL
X02SS0390006,NORMAL
X02SS0390024,NORMAL
X02SS0400006,NORMAL
X02SS0400024,NORMAL

APPENDIX L
TABLE 5-7

SURFACE SOIL FREQUENCY OF DETECTION
AREA 8 (USO-02)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

min_nd	max_nd	min	max	min_c	max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
0.19	0.2	0.028	0.05	0.028	0.05	J	J	0.028 - 0.05	0.19 - 0.2	X02SS0280006	0.039	0.098131
0.19	0.2	0.05	0.05	0.05	0.05	J	J	0.05	0.19 - 0.2	X02SS0300024	0.05	0.099031
1.1	1.2	0.086	0.17	0.086	0.17	J	J	0.086 - 0.17	1.1 - 1.2	X02SS0400006	0.128	0.586013
0	0	2270	19300	2270	19300		J	2270 - 19300	0	X02SS0150024	8947.375	8947.375
0.032	0.1	0.033	0.17	0.033	0.17	J	L	0.033 - 0.17	0.032 - 0.1	X02SS0010006	0.054206	0.042063
0	0	0.53	4.5	0.53	4.5	J	J	0.53 - 4.5	0	X02SS0210006	1.8445	1.8445
0	0	12.2	95.8	12.2	95.8	K	K	12.2 - 95.8	0	X02SS0090006	39.21875	39.21875
0.16	0.17	0.17	1.1	0.17	1.1	J		0.17 - 1.1	0.16 - 0.17	X02SS0010024	0.397838	0.374125
0.079	0.16	0.11	0.11	0.11	0.11	J	J	0.11	0.079 - 0.16	X02SS0010006	0.11	0.0428
0	0	36.7	20300	36.7	20300		K	36.7 - 20300	0	X02SS0180006	561.005625	561.005625
0	0	4	1570	4	1570	K	K	4 - 1570	0	X02SS0100024	30.018125	30.018125
0	0	0.79	12.8	0.79	12.8			0.79 - 12.8	0	X02SS0090006	4.344875	4.344875
0	0	1.5	77.4	1.5	77.4			1.5 - 77.4	0	X02SS0190024	8.53	8.53
0	0	2380	24100	2380	24100			2380 - 24100	0	X02SS0310024	8447.5	8447.5
0	0	4.9	72.1	4.9	72.1			4.9 - 72.1	0	X02SS0090006	14.70125	14.70125
0	0	1.4	13.8	1.4	13.8			1.4 - 13.8	0	X02SS0310024	5.644375	5.644375
0	0	180	11700	180	11700	K	K	180 - 11700	0	X02SS0180006	701.2	701.2
0	0	14.2	605	14.2	605	K	J	14.2 - 605	0	X02SS0320006	137.744375	137.744375
0	0	0.0098	0.32	0.0098	0.32	J	L	0.0098 - 0.32	0	X02SS0190006	0.034885	0.034885
0	0	2.4	21.8	2.4	21.8			2.4 - 21.8	0	X02SS0300006	7.468125	7.468125
0	0	242	1510	242	1510	K	K	242 - 1510	0	X02SS0310024	595.61875	595.61875
0.032	0.065	0.034	0.43	0.034	0.43	J	L	0.034 - 0.43	0.032 - 0.065	X02SS0040006	0.144892	0.112947
0.079	0.16	0.12	0.12	0.12	0.12	J	J	0.12	0.079 - 0.16	X02SS0090006	0.12	0.042938
8.1	8.3	8.5	90.8	8.5	90.8	J		8.5 - 90.8	8.1 - 8.3	X02SS0300006	21.27973	19.991875
0	0	1.9	11.3	1.9	11.3	K	K	1.9 - 11.3	0	X02SS0320006	4.33625	4.33625
0.8	1.6	0.83	1.3	0.83	1.3	J	J	0.83 - 1.3	0.8 - 1.6	X02SS0300006	1.0075	0.479969
0	0	8.1	34.3	8.1	34.3	K	K	8.1 - 34.3	0	X02SS0090006	17.436875	17.436875
0	0	5.9	52.7	5.9	52.7			5.9 - 52.7	0	X02SS0090006	18.86875	18.86875
0	0	52.7	52.7	52.7	52.7			52.7	0	X02SS0390024	52.7	52.7
0	0	13.7	13.7	13.7	13.7			13.7	0	X02SS0390024	13.7	13.7
0	0	4.59	4.59	4.59	4.59	J	J	4.59	0	X02SS0390024	4.59	4.59
0	0	3800	3800	3800	3800			3800	0	X02SS0390024	3800	3800
0	0	86.3	86.3	86.3	86.3			86.3	0	X02SS0390024	86.3	86.3

APPENDIX L
TABLE 5-8

SURFACE SOILS (0 to 0.5 ft) FREQUENCY OF DETECTION
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	frequency	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c	max_c	min_qual
Explosives (mg/kg)																							
99-65-0	1,3-Dinitrobenzene	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	2/40	0.19	0.2	0.19	0.2	0.028	0.05	0.028	0.05	J
55-63-0	Nitroglycerin	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1/40	1.1	1.2	1.1	1.2	0.17	0.17	0.17	0.17	J
Inorganics (mg/kg)																							
7429-90-5	Aluminum	19700	7700	7700	7800	NA	10	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	2570	13900	2570	13900	
7440-36-0	Antimony	NA	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	26/40	0.032	0.1	0.032	0.1	0.034	0.17	0.034	0.17	J
7440-38-2	Arsenic	14.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	0.8	4.5	0.8	4.5	J
7440-39-3	Barium	80.4	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	14.3	95.8	14.3	95.8	K
7440-41-7	Beryllium	1.1	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	36/40	0.16	0.17	0.16	0.17	0.17	0.99	0.17	0.99	J
7440-43-9	Cadmium	2.5	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	1/40	0.079	0.083	0.079	0.083	0.11	0.11	0.11	0.11	J
7440-70-2	**Calcium**	2060	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	40/40	0	0	0	0	57.6	20300	57.6	20300	K
7440-47-3	Chromium	33.4	26	12000	12000	2000000000	26	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	4.4	20.6	4.4	20.6	K
7440-48-4	Cobalt	22.3	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	1.1	12.8	1.1	12.8	
7440-50-8	**Copper**	20.3	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	2	65.5	2	65.5	
7439-89-6	Iron	38500	5500	5500	5500	NA	11	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	3460	15100	3460	15100	
7439-92-1	**Lead**	62.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	6.1	72.1	6.1	72.1	
7439-93-2	**Lithium**	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	40/40	0	0	0	0	1.7	12.8	1.7	12.8	
7439-95-4	**Magnesium**	1620	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	40/40	0	0	0	0	191	11700	191	11700	K
7439-96-5	Manganese	1390	160	180	160	950	220	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	21.4	605	21.4	605	K
7439-97-6	**Mercury**	0.16	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	40/40	0	0	0	0	0.013	0.32	0.013	0.32	J
7440-02-0	Nickel	15.4	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	2.8	21.8	2.8	21.8	
7440-09-7	Potassium	1470	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	40/40	0	0	0	0	242	1070	242	1070	K
7782-49-2	Selenium	1.2	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	34/40	0.032	0.033	0.032	0.033	0.038	0.43	0.038	0.43	J
7440-22-4	Silver	0.84	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	1/40	0.079	0.083	0.079	0.083	0.12	0.12	0.12	0.12	J
7440-23-5	Sodium	120	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	37/40	8.1	8.2	8.1	8.2	9.1	90.8	9.1	90.8	J
7440-24-6	Strontium	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	40/40	0	0	0	0	1.9	11.3	1.9	11.3	K
7440-31-5	**Tin**	NA	0.89	4700	4700	NA	NA	0.89	NC	NC	NC	NC	NC	6/40	0.8	0.83	0.8	0.83	0.83	1.3	0.83	1.3	J
7440-62-2	Vanadium	53.3	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	9.3	34.3	9.3	34.3	K
7440-66-6	**Zinc**	37.5	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0	8.2	52.7	8.2	52.7	

Associated Samples:

X02SS0010006,NORMAL	X02SS0160006,NORMAL	X02SS0310006,NORMAL
X02SS0020006,NORMAL	X02SS0170006,NORMAL	X02SS0320006,NORMAL
X02SS0030006,NORMAL	X02SS0180006,NORMAL	X02SS0330006,DUP
X02SS0040006,NORMAL	X02SS0190006,NORMAL	X02SS0330006-AVG,AVG
X02SS0050006,DUP	X02SS0200006,NORMAL	X02SS0330006-D,DUP
X02SS0050006-AVG,AVG	X02SS0210006,NORMAL	X02SS0340006,NORMAL
X02SS0050006-D,DUP	X02SS0220006,NORMAL	X02SS0350006,NORMAL
X02SS0060006,NORMAL	X02SS0230006,NORMAL	X02SS0360006,NORMAL
X02SS0070006,NORMAL	X02SS0240006,NORMAL	X02SS0370006,NORMAL
X02SS0080006,NORMAL	X02SS0250006,NORMAL	X02SS0380006,NORMAL
X02SS0090006,NORMAL	X02SS0260006,DUP	X02SS0390006,NORMAL
X02SS0100006,NORMAL	X02SS0260006-AVG,AVG	X02SS0400006,NORMAL
X02SS0110006,NORMAL	X02SS0260006-D,DUP	
X02SS0120006,NORMAL	X02SS0270006,NORMAL	
X02SS0130006,NORMAL	X02SS0280006,NORMAL	
X02SS0140006,NORMAL	X02SS0290006,NORMAL	
X02SS0150006,NORMAL	X02SS0300006,NORMAL	

APPENDIX L
TABLE 5-8

SURFACE SOILS (0 to 0.5 ft) FREQUENCY OF DETECTION
AREA 8 (UXO-02)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

max_qual	range	range_nd	samp_max	avg_pos	avg_all
J	0.028 - 0.05	0.19 - 0.2	X02SS0280006	0.039	0.0967
J	0.17	1.1 - 1.2	X02SS0400006	0.17	0.58675
J	2570 - 13900	0	X02SS0090006	8370.5	8370.5
L	0.034 - 0.17	0.032 - 0.1	X02SS0010006	0.057279	0.049569
J	0.8 - 4.5	0	X02SS0210006	1.9325	1.9325
K	14.3 - 95.8	0	X02SS0090006	37.13875	37.13875
	0.17 - 0.99	0.16 - 0.17	X02SS0090006	0.365	0.336625
J	0.11	0.079 - 0.083	X02SS0010006	0.11	0.042681
K	57.6 - 20300	0	X02SS0180006	763.49	763.49
	4.4 - 20.6	0	X02SS0300006	10.12625	10.12625
	1.1 - 12.8	0	X02SS0090006	4.205	4.205
	2 - 65.5	0	X02SS0190006	9.10375	9.10375
	3460 - 15100	0	X02SS0090006	8015	8015
	6.1 - 72.1	0	X02SS0090006	17.7275	17.7275
	1.7 - 12.8	0	X02SS0090006	5.215	5.215
K	191 - 11700	0	X02SS0180006	783.5875	783.5875
J	21.4 - 605	0	X02SS0320006	149.8975	149.8975
L	0.013 - 0.32	0	X02SS0190006	0.04405	0.04405
	2.8 - 21.8	0	X02SS0300006	6.84875	6.84875
K	242 - 1070	0	X02SS0400006	554.125	554.125
L	0.038 - 0.43	0.032 - 0.033	X02SS0040006	0.150824	0.130631
J	0.12	0.079 - 0.083	X02SS0090006	0.12	0.042956
	9.1 - 90.8	8.1 - 8.2	X02SS0300006	20.940541	19.67625
K	1.9 - 11.3	0	X02SS0320006	4.45375	4.45375
J	0.83 - 1.3	0.8 - 0.83	X02SS0300006	0.985	0.496875
K	9.3 - 34.3	0	X02SS0090006	17.67125	17.67125
	8.2 - 52.7	0	X02SS0090006	18.99375	18.99375

APPENDIX L
TABLE 6-1

SURFACE SOIL COPC SELECTION
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Location of Maximum Concentration (1)	Average of Positive Results(1)	Average of All Results(1)	Background 95% UCL	Ecological Effects Quotient(2)				Maximum Greater than Background?	Rationale for Invertebrate/Plant Deletion or Selection	Retain for Food Chain Modeling?
								Invertebrates(3)	Plants(3)	Avian(4)	Mammals(4)			
Volatile Organics (ug/kg)														
Benzene	7/20	0.51 J	13.5	X04SS0090006	3.45	1.80	NA	0.0004	0.0004	0.0005	0.0005	NA	BSL	NO
Toluene	2/20	0.77 J	3.3 J	X04SS0010006	2.0	1.08	140	0.00004	0.00004	0.000002	0.000002	NO	BKG/BSL	NO
Explosives (mg/kg)														
Nitroglycerin	1/20	0.43 J	0.43 J	X04SS0190006	0.43	0.5765	NA	NA	NA	NA	NA	NA	NSL	NO
Inorganics (mg/kg)														
Aluminum	20/20	212	26000	X04SS0010006	15753	15753	19700	pH	pH	NA	NA	YES	ASL	NO
Antimony	7/20	0.033 J	0.099 J	X04SS0100006	0.0583	0.0658	NA	0.0013	0.0198	NA	0.3667	NA	BSL	NO
Arsenic	20/20	1.8	5.8	X04SS0060006, X04SS0070006	4.00	4.00	14.9	0.0967	0.3222	0.1349	0.1261	NO	BKG/BSL	NO
Barium	20/20	34.6	76.9	X04SS0010006	56.9	56.9	80.4	0.2330	0.1538	0.1748	0.0385	YES	BSL	NO
Beryllium	20/20	0.33 J	0.92 J	X04SS0160006	0.581	0.581	1.1	0.0230	0.0920	NA	0.0438	NO	BKG/BSL	NO
Cadmium	5/20	0.084 J	1.6	X04SS0100006	0.481	0.174	2.5	0.0114	0.0500	2.0779	4.4444	NO	BKG/BSL	NO
Calcium	20/20	159	35900	X04SS0190006	2293	2293	2060	NA	NA	NA	NA	YES	NUT	NO
Chromium	20/20	13.6	28	X04SS0050006	20.8	20.8	33.4	0.4375	0.4375	1.0769	0.8235	NO	BKG/BSL	NO
Cobalt	20/20	2.6	19.7	X04SS0040006	9.26	9.26	22.3	0.0985	1.5154	0.1642	0.0857	NO	BKG/BSL	NO
Copper	20/20	7.6	89	X04SS0160006	20.1	20.1	20.3	1.1125	1.2714	3.1786	1.8163	YES	ASL	YES
Iron	20/20	7250	24100	X04SS0160006	16552	16552	38500	NA	NA	pH	NA	NO	BKG	NO
Lead	20/20	11.8	119	X04SS0110006	39.2	39.2	62.5	0.0700	0.9917	10.8182	2.1250	YES	BSL	YES
Lithium	20/20	4.4	22.9	X04SS0160006	15.2	15.2	NA	NA	11.4500	NA	NA	NA	NSL/ASL	NO
Magnesium	20/20	702	3460	X04SS0190006	1313	1313	1620	NA	NA	NA	NA	YES	NUT	NO
Manganese	20/20	72.3	842	X04SS0040006	358	358	1390	1.8711	3.8273	0.1958	0.2105	NO	BKG	NO
Mercury	19/20	0.038 J	0.57 J	X04SS0190006	0.0874	0.0839	0.16	0.0475	0.0475	9.8276	0.3608	YES	BSL	YES
Nickel	20/20	7.9	63.6	X04SS0190006	16.8	16.8	15.4	0.2271	1.6737	0.3029	0.4892	YES	ASL	NO
Potassium	20/20	507	2240	X04SS0120006	1357	1357	1470	NA	NA	NA	NA	YES	NUT	NO
Silver	1/20	0.79	0.79	X04SS0190006	0.79	0.107	0.84	NA	0.0014	0.1881	0.0564	NO	BKG/BSL	NO
Sodium	20/20	19.7 J	54.2	X04SS0120006	34.2	34.2	120	NA	NA	NA	NA	NO	NUT	NO
Strontium	20/20	5.3	49.1	X04SS0190006	9.34	9.34	NA	0.4092	0.4092	0.4092	0.4092	NA	BSL	NO
Vanadium	20/20	11.4	42.8	X04SS0050006	31.4	31.4	53.3	0.3292	0.3292	5.4872	0.1529	NO	BKG/BSL	NO
Zinc	20/20	25.3	239	X04SS0030006	53.2	53.2	37.5	1.9917	1.4938	5.1957	3.0253	YES	ASL	YES
Miscellaneous														
Cation Exchange Capacity (MEQ/kg)	2/2	43	68.9	X04SS0090006	56.0	56.0	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture (%)	40/40	16.7	29	X04SS0140006	21.5	21.5	NA	NA	NA	NA	NA	NA	NA	NA
PH (s.u.)	2/2	4.04	5.04	X04SS0080024	4.54	4.54	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (mg/kg)	2/2	2410	15800	X04SS0090006	9105	9105	NA	NA	NA	NA	NA	NA	NA	NA
Total Solids (%)	40/40	71	83.3	X04SS0010006	78.5	78.5	NA	NA	NA	NA	NA	NA	NA	NA

-shading of the chemical name indicates the chemical was retianed as a COPC for soil invertebrates or plants.

1 - Sample and duplicate were considered as two separate samples when determining the minimum and maximum concentrations, but were averaged and considered one sample for average calculations.

2 - Ecological effects quotients were calculated by dividing the maximum detected concentration by the COPC screening level. Values are unitless. The screening levels are provided in Appendix L Table titled "Soil Ecological Screening Levels".

3 - Cells are shaded for plants/invertebrates if the EEQ > 1; the chemical was retained as a COPC for plants/invertebrates if the maximum concentration is > background and the EEQ > 1 or a screening level was not available for that receptor.

4 - Shading for wildlife receptors indicates that the chemical exceded the screening level and was retained for food chain modeling if the maximum concentration was also greater than background. If a screening level was not available for wildlife receptors, the chemical was not retained for food chain modeling unless it is considered to be an important bioaccumulative chemical as indicated in USEPA (2006) or the chemical was retained for the other wildlife receptor.

Rationale Codes
For Selection as a COPC:
ASL = Above COPC screening level
NSL = No screening level
For Elimination as a COPC:
BSL = Below COPC screening level
NUT = Essential nutrient
BKG = Maximum less than Background

Associated Samples:

X04SS0010006,NORMAL	X04SS0040006,NORMAL	X04SS0070006,NORMAL	X04SS0080006-D,DUP	X04SS0110006,NORMAL	X04SS0140006,NORMAL
X04SS0010024,NORMAL	X04SS0040024,NORMAL	X04SS0070024,DUP	X04SS0080024,NORMAL	X04SS0110024,NORMAL	X04SS0140024,NORMAL
X04SS0020006,NORMAL	X04SS0050006,NORMAL	X04SS0070024-AVG,AVG	X04SS0090006,NORMAL	X04SS0120006,NORMAL	
X04SS0020024,NORMAL	X04SS0050024,NORMAL	X04SS0070024-D,DUP	X04SS0090024,NORMAL	X04SS0120024,NORMAL	
X04SS0030006,NORMAL	X04SS0060006,NORMAL	X04SS0080006,DUP	X04SS0100006,NORMAL	X04SS0130006,NORMAL	
X04SS0030024,NORMAL	X04SS0060024,NORMAL	X04SS0080006-AVG,AVG	X04SS0100024,NORMAL	X04SS0130024,NORMAL	

APPENDIX L
TABLE 6-2

TERRESTRIAL FOOD CHAIN MODEL - CONSERVATIVE SCENARIO
INSECTIVOROUS AND HERBIVOROUS RECEPTORS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILTIY
INDIAN HEAD, MARYLAND

Chemical	Herbivorous Receptors EEQs				Insectivorous Receptors EEQs			
	Bobwhite Quail		Meadow Vole		American Robin		Short-Tailed Shrew	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics								
COPPER	6.2E-01	7.2E-02	2.8E-01	1.9E-02	2.4E+00	2.8E-01	9.2E-01	6.3E-02
LEAD	1.3E+00	4.8E-02	1.8E-01	4.6E-03	5.7E+00	2.1E-01	9.4E-01	2.4E-02
MERCURY	1.1E+01	1.1E+00	2.0E+00	4.1E-01	2.5E+01	2.5E+00	3.0E+00	6.1E-01
ZINC	2.1E-01	8.2E-02	1.6E-01	4.0E-02	1.4E+00	5.2E-01	7.4E-01	1.9E-01

Cells are shaded if the value is greater than 1.0

NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
EEQ - Ecological Effects Quotient

APPENDIX L
TABLE 6-3

TERRESTRIAL FOOD CHAIN MODEL - AVERAGE SCENARIO
INSECTIVOROUS AND HERBIVOROUS RECEPTORS
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Herbivorous Receptors EEQs				Insectivorous Receptors EEQs			
	Bobwhite Quail		Meadow Vole		American Robin		Short-Tailed Shrew	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics								
LEAD	2.1E-01	7.8E-03	2.6E-02	6.7E-04	1.6E+00	6.0E-02	3.0E-01	7.6E-03
MERCURY	1.1E+00	1.1E-01	1.3E-01	2.6E-02	1.1E+01	1.1E+00	1.3E+00	2.6E-01

Cells are shaded if the value is greater than 1.0
Only chemicals with EEQs > 1.0 in the conservative food chain model are presented in this table.

NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
EEQ - Ecological Effects Quotient

APPENDIX L
TABLE 6-4

SURFACE SOIL FREQUENCY OF DETECTION
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	utl95cv	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	lanl	reference	frequency	min_ndc	max_ndc
Explosives (mg/kg)																		
55-63-0	Nitroglycerin	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	4/40	1.1	1.2
Inorganics (mg/kg)																		
7429-90-5	**Aluminum**	19700	7700	7700	N	7800	NA	NA	NC	NC	NC	NC	NC	NC	ORNL-R	40/40	0	0
7440-36-0	**Antimony**	NA	0.27	3.1	N	3.1	13	0.27	NC	NC	NC	NC	NC	NC	U.S. EPA	9/40	0.033	0.45
7440-38-2	Arsenic	14.9	0.026	0.39	C	0.43	0.026	18	NC	NC	NC	NC	NC	NC	MDE Clea	40/40	0	0
7440-39-3	Barium	80.4	330	1500	N	1600	6000	330	NC	NC	NC	NC	NC	NC	U.S. EPA	40/40	0	0
7440-41-7	Beryllium	1.1	16	16	N	16	1200	21	NC	NC	NC	NC	NC	NC	MDE Clea	40/40	0	0
7440-43-9	Cadmium	2.5	0.36	7	N	3.9	27	0.36	NC	NC	NC	NC	NC	NC	U.S. EPA	9/40	0.08	0.17
7440-70-2	Calcium	2060	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	40/40	0	0
7440-47-3	Chromium	33.4	26	12000		NA	NA	26	NC	NC	NC	NC	NC	NC	U.S. EPA	40/40	0	0
7440-48-4	Cobalt	22.3	2.3	2.3	N	NA	NA	13	NC	NC	NC	NC	NC	NC	ORNL-R	40/40	0	0
7440-50-8	**Copper**	20.3	28	310	N	310	11000	28	NC	NC	NC	NC	NC	NC	U.S. EPA	40/40	0	0
7439-89-6	Iron	38500	5500	5500	N	5500	NA	NA	NC	NC	NC	NC	NC	NC	MDE Clea	40/40	0	0
7439-92-1	**Lead**	62.5	11	400		400	NA	11	NC	NC	NC	NC	NC	NC	U.S. EPA	40/40	0	0
7439-93-2	**Lithium**	NA	2	16	N	NA	NA	NA	NA	2	NA	NC	NC	NC	ORNL Pla	40/40	0	0
7439-95-4	Magnesium	1620	4400	NA		NA	NA	NA	4400	NC	NC	NC	NC	NC	R3BTAG	40/40	0	0
7439-96-5	Manganese	1390	160	180	N	160	950	220	NC	NC	NC	NC	NC	NC	MDE Clea	40/40	0	0
7439-97-6	**Mercury**	0.16	0.058	2.3	N	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	R3BTAG	38/40	0.035	0.035
7440-02-0	**Nickel**	15.4	38	150	N	160	NA	38	NC	NC	NC	NC	NC	NC	U.S. EPA	40/40	0	0
7440-09-7	Potassium	1470	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	40/40	0	0
7440-22-4	Silver	0.84	4.2	39	N	39	31	4.2	NC	NC	NC	NC	NC	NC	U.S. EPA	2/40	0.08	0.17
7440-23-5	Sodium	120	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	40/40	0	0
7440-24-6	Strontium	NA	120	4700	N	NA	NA	NA	120	NC	NC	NC	NC	NC	R3BTAG	40/40	0	0
7440-31-5	**Tin**	NA	0.89	4700	N	4700	NA	NA	0.89	NC	NC	NC	NC	NC	R3BTAG	2/40	0.81	1.7
7440-62-2	Vanadium	53.3	7.8	39	N	7.8	730	7.8	NC	NC	NC	NC	NC	NC	MDE Clea	40/40	0	0
7440-66-6	**Zinc**	37.5	46	2300	N	2300	14000	46	NC	NC	NC	NC	NC	NC	U.S. EPA	40/40	0	0
Miscellaneous																		
TTNUS014	Cation Exchange Capacity (MEQ/kg)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		2/2	0	0
TTNUS288	Percent Moisture (%)	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		40/40	0	0
TTNUS002	PH (s.u.)	8.8	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		2/2	0	0
TTNUS003	Total Organic Carbon (mg/kg)	57200	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		2/2	0	0
TTNUS046	**Total Solids (%)**	79.2	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		40/40	0	0
Volatile Organics (ug/kg)																		
71-43-2	**Benzene**	NA	1.9	1100	C	12000	1.9	NA	100	NC	NC	NC	NC	NC	MDE Clea	10/40	0.74	2.2
75-15-0	Carbon Disulfide	NA	19000	82000	N	780000	19000	NA	NA	NA	NA	NC	NC	NC	MDE Clea	1/40	0.74	2.2
108-88-3	Toluene	140	100	500000	N	630000	27000	NA	100	NC	NC	NC	NC	NC	R3BTAG	4/40	0.74	20.9

Associated Samples:

X04SS0010006,NORMAL
X04SS0010024,NORMAL
X04SS0020006,NORMAL
X04SS0020024,NORMAL
X04SS0030006,NORMAL
X04SS0030024,NORMAL
X04SS0040006,NORMAL
X04SS0040024,NORMAL
X04SS0050006,NORMAL
X04SS0050024,NORMAL
X04SS0060006,NORMAL
X04SS0060024,NORMAL
X04SS0070006,NORMAL
X04SS0070024,DUP
X04SS0070024-AVG,AVG
X04SS0070024-D,DUP
X04SS0080006,DUP
X04SS0080006-AVG,AVG
X04SS0080006-D,DUP
X04SS0080024,NORMAL
X04SS0090006,NORMAL
X04SS0090024,NORMAL
X04SS0100006,NORMAL
X04SS0100024,NORMAL
X04SS0110006,NORMAL
X04SS0110024,NORMAL
X04SS0120006,NORMAL
X04SS0120024,NORMAL
X04SS0130006,NORMAL
X04SS0130024,NORMAL
X04SS0140006,NORMAL
X04SS0140024,NORMAL
X04SS0150006,NORMAL
X04SS0150024,NORMAL
X04SS0160006,NORMAL
X04SS0160024,NORMAL
X04SS0170006,NORMAL
X04SS0170024,NORMAL
X04SS0180006,NORMAL
X04SS0180024,NORMAL
X04SS0190006,NORMAL
X04SS0190024,NORMAL
X04SS0200006,NORMAL
X04SS0200024,NORMAL

APPENDIX L
TABLE 6-4

SURFACE SOIL FREQUENCY OF DETECTION
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

min_nd	max_nd	min	max	min_c	max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
1.1	1.2	0.089	0.43	0.089	0.43	J	J	0.089 - 0.43	1.1 - 1.2	X04SS0190006	0.19475	0.546975
0	0	212	26000	212	26000			212 - 26000	0	X04SS0010006	16104.7	16104.7
0.033	0.45	0.033	0.099	0.033	0.099	J	J	0.033 - 0.099	0.033 - 0.45	X04SS0100006	0.054556	0.06105
0	0	1.7	9.8	1.7	9.8	K	K	1.7 - 9.8	0	X04SS0010024	4.05625	4.05625
0	0	28.9	86.8	28.9	86.8			28.9 - 86.8	0	X04SS0010024	60.4675	60.4675
0	0	0.26	1.1	0.26	1.1	J		0.26 - 1.1	0	X04SS0160024	0.610625	0.610625
0.08	0.17	0.084	1.6	0.084	1.6	J		0.084 - 1.6	0.08 - 0.17	X04SS0100006	0.347111	0.130375
0	0	159	35900	159	35900			159 - 35900	0	X04SS0190006	1864.7625	1864.7625
0	0	12	28.9	12	28.9			12 - 28.9	0	X04SS0030024	21.34	21.34
0	0	2.6	19.7	2.6	19.7			2.6 - 19.7	0	X04SS0040006	9.205	9.205
0	0	7.1	89	7.1	89			7.1 - 89	0	X04SS0160006	18.57375	18.57375
0	0	6260	30500	6260	30500			6260 - 30500	0	X04SS0100024	17258.75	17258.75
0	0	11.8	122	11.8	122			11.8 - 122	0	X04SS0010024	35.59375	35.59375
0	0	4.4	28.3	4.4	28.3			4.4 - 28.3	0	X04SS0100024	16.08125	16.08125
0	0	702	3460	702	3460			702 - 3460	0	X04SS0190006	1350.725	1350.725
0	0	64	842	64	842			64 - 842	0	X04SS0040006	325.5275	325.5275
0.035	0.035	0.025	0.57	0.025	0.57	J	J	0.025 - 0.57	0.035	X04SS0190006	0.078559	0.075506
0	0	7.9	84.4	7.9	84.4			7.9 - 84.4	0	X04SS0190024	17.37875	17.37875
0	0	507	2720	507	2720			507 - 2720	0	X04SS0160024	1461.5875	1461.5875
0.08	0.17	0.11	0.79	0.11	0.79	J		0.11 - 0.79	0.08 - 0.17	X04SS0190006	0.45	0.0889
0	0	19.7	94	19.7	94	J		19.7 - 94	0	X04SS0160024	38.4825	38.4825
0	0	5.3	49.1	5.3	49.1			5.3 - 49.1	0	X04SS0190006	9.5425	9.5425
0.81	1.7	1.1	1.7	1.1	1.7	J	J	1.1 - 1.7	0.81 - 1.7	X04SS0100024	1.4	0.726938
0	0	11.4	44.9	11.4	44.9			11.4 - 44.9	0	X04SS0050024	31.61625	31.61625
0	0	25.3	239	25.3	239			25.3 - 239	0	X04SS0030006	53.87375	53.87375
0	0	43	68.9	43	68.9			43 - 68.9	0	X04SS0090006	55.95	55.95
0	0	16.7	29	16.7	29			16.7 - 29	0	X04SS0140006	21.54	21.54
0	0	4.04	5.04	4.04	5.04			4.04 - 5.04	0	X04SS0080024	4.54	4.54
0	0	2410	15800	2410	15800			2410 - 15800	0	X04SS0090006	9105	9105
0	0	71	83.3	71	83.3			71 - 83.3	0	X04SS0010006	78.46	78.46
0.74	2.2	0.51	13.5	0.51	13.5	J	L	0.51 - 13.5	0.74 - 2.2	X04SS0090006	3.2665	1.45025
0.74	2.2	0.42	0.42	0.42	0.42	J	J	0.42	0.74 - 2.2	X04SS0190024	0.42	0.856625
0.74	20.9	0.76	129	0.76	129	J	J	0.76 - 129	0.74 - 20.9	X04SS0070024-D	17.45125	2.772625

APPENDIX L
TABLE 6-5

SURFACE SOIL (0 to 0.5 feet) FREQUENCY OF DETECTION
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	utl95cv	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	lanl	reference	frequency
Explosives (mg/kg)																
55-63-0	Nitroglycerin	NA	0.61	0.61	N	NA	NA	NA	NA	NA	NA	NC	NC	NC	ORNL-R	1/20
Inorganics (mg/kg)																
7429-90-5	**Aluminum**	19700	7700	7700	N	7800	NA	NA	NC	NC	NC	NC	NC	NC	ORNL-R	20/20
7440-36-0	Antimony	NA	0.27	3.1	N	3.1	13	0.27	NC	NC	NC	NC	NC	NC	U.S. EPA Eco	7/20
7440-38-2	Arsenic	14.9	0.026	0.39	C	0.43	0.026	18	NC	NC	NC	NC	NC	NC	MDE Cleanup	20/20
7440-38-2	Arsenic	14.9	0.026	0.39	C	0.43	0.026	18	NC	NC	NC	NC	NC	NC	MDE Cleanup	20/20
7440-39-3	Barium	80.4	330	1500	N	1600	6000	330	NC	NC	NC	NC	NC	NC	U.S. EPA Eco	20/20
7440-41-7	Beryllium	1.1	16	16	N	16	1200	21	NC	NC	NC	NC	NC	NC	MDE Cleanup	20/20
7440-43-9	Cadmium	2.5	0.36	7	N	3.9	27	0.36	NC	NC	NC	NC	NC	NC	U.S. EPA Eco	5/20
7440-70-2	**Calcium**	2060	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	20/20
7440-47-3	Chromium	33.4	26	12000		NA	NA	26	NC	NC	NC	NC	NC	NC	U.S. EPA Eco	20/20
7440-48-4	Cobalt	22.3	2.3	2.3	N	NA	NA	13	NC	NC	NC	NC	NC	NC	ORNL-R	20/20
7440-50-8	**Copper**	20.3	28	310	N	310	11000	28	NC	NC	NC	NC	NC	NC	U.S. EPA Eco	20/20
7439-89-6	Iron	38500	5500	5500	N	5500	NA	NA	NC	NC	NC	NC	NC	NC	MDE Cleanup	20/20
7439-92-1	**Lead**	62.5	11	400		400	NA	11	NC	NC	NC	NC	NC	NC	U.S. EPA Eco	20/20
7439-93-2	**Lithium**	NA	2	16	N	NA	NA	NA	NA	2	NA	NC	NC	NC	ORNL Plant	20/20
7439-95-4	Magnesium	1620	4400	NA		NA	NA	NA	4400	NC	NC	NC	NC	NC	R3BTAG	20/20
7439-96-5	Manganese	1390	160	180	N	160	950	220	NC	NC	NC	NC	NC	NC	MDE Cleanup	20/20
7439-97-6	**Mercury**	0.16	0.058	2.3	N	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	R3BTAG	19/20
7440-02-0	**Nickel**	15.4	38	150	N	160	NA	38	NC	NC	NC	NC	NC	NC	U.S. EPA Eco	20/20
7440-09-7	**Potassium**	1470	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	20/20
7440-22-4	Silver	0.84	4.2	39	N	39	31	4.2	NC	NC	NC	NC	NC	NC	U.S. EPA Eco	1/20
7440-23-5	Sodium	120	NA	NA		NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	20/20
7440-24-6	Strontium	NA	120	4700	N	NA	NA	NA	120	NC	NC	NC	NC	NC	R3BTAG	20/20
7440-62-2	Vanadium	53.3	7.8	39	N	7.8	730	7.8	NC	NC	NC	NC	NC	NC	MDE Cleanup	20/20
7440-66-6	**Zinc**	37.5	46	2300	N	2300	14000	46	NC	NC	NC	NC	NC	NC	U.S. EPA Eco	20/20
Miscellaneous																
TTNUS014	Cation Exchange Capacity	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		1/1
TTNUS288	Percent Moisture	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		20/20
TTNUS002	Ph	8.8	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		1/1
TTNUS003	Total Organic Carbon	57200	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		1/1
TTNUS046	Total Solids	79.2	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC		20/20
Volatile Organics (ug/kg)																
71-43-2	**Benzene**	NA	1.9	1100	C	12000	1.9	NA	100	NC	NC	NC	NC	NC	MDE Cleanup	7/20
108-88-3	Toluene	140	100	500000	N	630000	27000	NA	100	NC	NC	NC	NC	NC	R3BTAG	2/20

Associated Samples:

X04SS0010006,NORMAL
X04SS0020006,NORMAL
X04SS0030006,NORMAL
X04SS0040006,NORMAL
X04SS0050006,NORMAL
X04SS0060006,NORMAL
X04SS0070006,NORMAL
X04SS0080006,DUP
X04SS0080006-AVG,AVG
X04SS0080006-D,DUP
X04SS0090006,NORMAL
X04SS0100006,NORMAL
X04SS0110006,NORMAL
X04SS0120006,NORMAL
X04SS0130006,NORMAL
X04SS0140006,NORMAL
X04SS0150006,NORMAL
X04SS0160006,NORMAL
X04SS0170006,NORMAL
X04SS0180006,NORMAL
X04SS0190006,NORMAL
X04SS0200006,NORMAL

APPENDIX L
TABLE 6-5

SURFACE SOIL (0 to 0.5 feet) FREQUENCY OF DETECTION
BASIC IED AREA (UXO-04)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

min_ndc	max_ndc	min_nd	max_nd	min	max	min_c	max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
1.1	1.2	1.1	1.2	0.43	0.43	0.43	0.43	J	J	0.43	1.1 - 1.2	X04SS0190006	0.43	0.5765
0	0	0	0	212	26000	212	26000			212 - 26000	0	X04SS0010006	15752.6	15752.6
0.033	0.26	0.033	0.26	0.033	0.099	0.033	0.099	J	J	0.033 - 0.099	0.033 - 0.26	X04SS0100006	0.058286	0.065775
0	0	0	0	1.8	5.8	1.8	5.8	K	K	1.8 - 5.8	0	X04SS0060006	4.0025	4.0025
0	0	0	0	1.8	5.8	1.8	5.8	K	K	1.8 - 5.8	0	X04SS0070006	4.0025	4.0025
0	0	0	0	34.6	76.9	34.6	76.9			34.6 - 76.9	0	X04SS0010006	56.925	56.925
0	0	0	0	0.33	0.92	0.33	0.92	J	J	0.33 - 0.92	0	X04SS0160006	0.581	0.581
0.081	0.17	0.081	0.17	0.084	1.6	0.084	1.6	J		0.084 - 1.6	0.081 - 0.17	X04SS0100006	0.4808	0.17365
0	0	0	0	159	35900	159	35900			159 - 35900	0	X04SS0190006	2293.05	2293.05
0	0	0	0	13.6	28	13.6	28			13.6 - 28	0	X04SS0050006	20.83	20.83
0	0	0	0	2.6	19.7	2.6	19.7			2.6 - 19.7	0	X04SS0040006	9.255	9.255
0	0	0	0	7.6	89	7.6	89			7.6 - 89	0	X04SS0160006	20.115	20.115
0	0	0	0	7250	24100	7250	24100			7250 - 24100	0	X04SS0160006	16552	16552
0	0	0	0	11.8	119	11.8	119		K	11.8 - 119	0	X04SS0110006	39.18	39.18
0	0	0	0	4.4	22.9	4.4	22.9			4.4 - 22.9	0	X04SS0160006	15.19	15.19
0	0	0	0	702	3460	702	3460			702 - 3460	0	X04SS0190006	1312.775	1312.775
0	0	0	0	72.3	842	72.3	842			72.3 - 842	0	X04SS0040006	358.19	358.19
0.035	0.035	0.035	0.035	0.038	0.57	0.038	0.57	J	J	0.038 - 0.57	0.035	X04SS0190006	0.087421	0.083925
0	0	0	0	7.9	63.6	7.9	63.6			7.9 - 63.6	0	X04SS0190006	16.75	16.75
0	0	0	0	507	2240	507	2240			507 - 2240	0	X04SS0120006	1357.45	1357.45
0.081	0.17	0.081	0.17	0.79	0.79	0.79	0.79			0.79	0.081 - 0.17	X04SS0190006	0.79	0.107
0	0	0	0	19.7	54.2	19.7	54.2	J		19.7 - 54.2	0	X04SS0120006	34.1625	34.1625
0	0	0	0	5.3	49.1	5.3	49.1			5.3 - 49.1	0	X04SS0190006	9.335	9.335
0	0	0	0	11.4	42.8	11.4	42.8			11.4 - 42.8	0	X04SS0050006	31.39	31.39
0	0	0	0	25.3	239	25.3	239			25.3 - 239	0	X04SS0030006	53.1825	53.1825
0	0	0	0	68.9	68.9	68.9	68.9			68.9	0	X04SS0090006	68.9	68.9
0	0	0	0	16.7	29	16.7	29			16.7 - 29	0	X04SS0140006	22.475	22.475
0	0	0	0	4.04	4.04	4.04	4.04			4.04	0	X04SS0090006	4.04	4.04
0	0	0	0	15800	15800	15800	15800			15800	0	X04SS0090006	15800	15800
0	0	0	0	71	83.3	71	83.3			71 - 83.3	0	X04SS0010006	77.525	77.525
1.6	2.1	1.6	2.1	0.51	13.5	0.51	13.5	J	L	0.51 - 13.5	1.6 - 2.1	X04SS0090006	3.45	1.80125
0.88	3.5	0.88	3.5	0.77	3.3	0.77	3.3	J	J	0.77 - 3.3	0.88 - 3.5	X04SS0010006	2.035	1.07675

APPENDIX L
TABLE 7-1

SURFACE SOIL COPC SELECTION
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND
Page 1 of 1

Chemical	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Location of Maximum Concentration (1)	Average of Positive Results(1)	Average of All Results(1)	Background 95% UCL	Ecological Effects Quotient(2)				Maximum Greater than Background?	Rationale for Invertebrate/Plant Deletion or Selection	Retain for Food Chain Modeling?
								Invertebrates(3)	Plants(3)	Avian(4)	Mammals(4)			
Explosives (mg/kg)														
2,4-Dinitrotoluene	1/25	0.25	0.25	X05SS0190006	0.25	0.1414	NA	NA	NA	NA	NA	NA	NSL	NO
HMX	3/25	0.94 K	18.3 K	X05SS0150006	7.78	1.021	NA	NA	NA	NA	NA	NA	NSL	NO
Nitroglycerin	4/25	0.099 J	0.94 J	X05SS0150006	0.35475	0.56076	NA	NA	NA	NA	NA	NA	NSL	NO
Inorganics (mg/kg)														
Aluminum	25/25	3610	18900 J	X05SS0130006	11984	11984	19700	pH	pH	NA	NA	NO	BKG	NO
Antimony	4/25	0.042 J	0.12 L	X05SS0220006	0.06825	0.03767	NA	0.0015	0.0240	NA	0.4444	NA	BSL	NO
Arsenic	25/25	0.88 L	9.3 L	X05SS0030006	3.1232	3.1232	14.9	0.1550	0.5167	0.2163	0.2022	NO	BKG/BSL	NO
Barium	25/25	25.9 K	92.4 K	X05SS0030006	48.924	48.924	80.4	0.2800	0.1848	0.2100	0.0462	YES	BSL	NO
Beryllium	25/25	0.29 J	0.82	X05SS0120006	0.5284	0.5284	1.1	0.0205	0.0820	NA	0.0390	NO	BKG/BSL	NO
Cadmium	14/25	0.098 J	1.2	X05SS0200006	0.4645	0.28292	2.5	0.0086	0.0375	1.5584	3.3333	NO	BKG/BSL	NO
Calcium	25/25	156 K	3230 K	X05SS0190006	854.54	854.54	2060	NA	NA	NA	NA	YES	NUT	NO
Chromium	25/25	10.8 K	25.5 K	X05SS0080006	16.714	16.714	33.4	0.3984	0.3984	0.9808	0.7500	NO	BKG/BSL	NO
Cobalt	25/25	2.4 L	20.4	X05SS0010006	8.638	8.638	22.3	0.1020	1.5692	0.1700	0.0887	NO	BKG	NO
Copper	25/25	6.2	60.1	X05SS0190006	16.366	16.366	20.3	0.7513	0.8586	2.1464	1.2265	YES	BSL	YES
Iron	25/25	8090	24600	X05SS0160006	14469.6	14469.6	38500	NA	pH	NA	NA	NO	BKG/BSL	NO
Lead	25/25	8.1 L	40.3	X05SS0220006	20.108	20.108	62.5	0.0237	0.3358	3.6636	0.7196	NO	BKG/BSL	NO
Lithium	25/25	4.4 L	21.5	X05SS0160006	12.17	12.17	NA	NA	10.7500	NA	NA	NA	NSL/ASL	NO
Magnesium	25/25	508	2960	X05SS0080006	1078.28	1078.28	1620	NA	NA	NA	NA	YES	NUT	NO
Manganese	25/25	68.5	1310	X05SS0030006	389.398	389.398	1390	2.9111	5.9545	0.3047	0.3275	NO	BKG	NO
Mercury	25/25	0.01 J	1.2	X05SS0100006	0.1465	0.1465	0.16	0.1000	0.1000	20.6897	0.7595	YES	BSL	YES
Nickel	25/25	7.1 L	230 L	X05SS0140006	21.708	21.708	15.4	0.8214	6.0526	1.0952	1.7692	YES	ASL	YES
Potassium	25/25	772	1920	X05SS0240006	1250.32	1250.32	1470	NA	NA	NA	NA	YES	NUT	NO
Selenium	14/25	0.044 L	0.3 L	X05SS0160006	0.128571	0.08248	1.2	0.0732	0.5769	0.2500	0.4762	NO	BKG/BSL	NO
Silver	3/25	0.37	4	X05SS0030006	1.633333	0.23669	0.84	NA	0.0071	0.9524	0.2857	YES	BSL	NO
Sodium	25/25	12.6 J	66.9 K	X05SS0030006	35.496	35.496	120	NA	NA	NA	NA	NO	NUT	NO
Strontium	25/25	4.7 K	11 K	X05SS0030006, X05SS0190006, X05SS0200006	7.48	7.48	NA	0.0917	0.0917	0.0917	0.0917	NA	BSL	NO
Vanadium	25/25	16.8 K	40.1 K	X05SS0020006	27.866	27.866	53.3	0.3085	0.3085	5.1410	0.1432	NO	BKG/BSL	NO
Zinc	25/25	18.7 L	73.6	X05SS0030006	38.506	38.506	37.5	0.6133	0.4600	1.6000	0.9316	YES	BSL	YES
Miscellaneous Parameters														
pH	3/3	5.61	6.96	X05SS0210006	6.453333	6.453333	8.8	NA	NA	NA	NA	NA	NA	NA

-shading of the chemical name indicates the chemical was retianed as a COPC for soil invertebrates or plants.

1 - Sample and duplicate were considered as two separate samples when determining the minimum and maximum concentrations, but were averaged and considered one sample for average calculations.

2 - Ecological effects quotients were calculated by dividing the maximum detected concentration by the COPC screening level. Values are unitless. The screening levels are provided in Appendix L Table titled "Soil Ecological Screening Levels".

3 - Cells are shaded for plants/invertebrates if the EEQ > 1; the chemical was retained as a COPC for plants/invertebrates if the maximum concentration is > background and the EEQ > 1 or a screening level was not available for that receptor.

4 - Shading for wildlife receptors indicates that the chemical exceded the screening level and was retained for food chain modeling if the maximum concentration was also greater than background. If a screening level was not available for wildlife receptors, the chemical was not retained for food chain modeling unless it is considered to be an important bioaccumulative chemical as indicated in USEPA (2006) or the chemical was retained for the other wildlife receptor.

Rationale Codes
For Selection as a COPC:
ASL = Above COPC screening level
NSL = No screening level
For Elimination as a COPC:
BSL = Below COPC screening level
NUT = Essential nutrient
BKG = Maximum less than Background

Associated Samples:

X05SS0010006,DUP	X05SS0040006,NORMAL	X05SS0090006,NORMAL	X05SS0090006,NORMAL	X05SS0180006,NORMAL	X05SS0210006-D,DUP
X05SS0010006-AVG,AVG	X05SS0050006,NORMAL	X05SS0100006,NORMAL	X05SS0140006,NORMAL	X05SS0190006,NORMAL	X05SS0220006,NORMAL
X05SS0010006-D,DUP	X05SS0060006,NORMAL	X05SS0110006,NORMAL	X05SS0150006,NORMAL	X05SS0200006,NORMAL	X05SS0230006,NORMAL
X05SS0020006,NORMAL	X05SS0070006,NORMAL	X05SS0120006,NORMAL	X05SS0160006,NORMAL	X05SS0210006,DUP	X05SS0240006,NORMAL
X05SS0030006,NORMAL	X05SS0080006,NORMAL	X05SS0130006,NORMAL	X05SS0170006,NORMAL	X05SS0210006-AVG,AVG	X05SS0250006,NORMAL

APPENDIX L
TABLE 7-2

TERRESTRIAL FOOD CHAIN MODEL - CONSERVATIVE SCENARIO
INSECTIVOROUS AND HERBIVOROUS RECEPTORS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Herbivorous Receptors EEQs				Insectivorous Receptors EEQs			
	Bobwhite Quail		Meadow Vole		American Robin		Short-Tailed Shrew	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics								
COPPER	4.7E-01	5.5E-02	2.3E-01	1.6E-02	1.6E+00	1.9E-01	6.2E-01	4.2E-02
MERCURY	2.3E+01	2.3E+00	4.3E+00	8.6E-01	3.4E+01	3.4E+00	4.0E+00	7.9E-01
NICKEL	6.0E-01	2.2E-01	8.9E-01	1.0E-01	6.8E+00	2.4E+00	1.6E+01	1.8E+00
ZINC	1.0E-01	3.9E-02	8.0E-02	2.0E-02	8.8E-01	3.4E-01	5.0E-01	1.3E-01

Cells are shaded if the value is greater than 1.0

NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
EEQ - Ecological Effects Quotient

APPENDIX L
TABLE 7-3

TERRESTRIAL FOOD CHAIN MODEL - AVERAGE SCENARIO
INSECTIVOROUS AND HERBIVOROUS RECEPTORS
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

	Herbivorous Receptors EEQs				Insectivorous Receptors EEQs			
	Bobwhite Quail		Meadow Vole		American Robin		Short-Tailed Shrew	
Chemical	**NOAEL**	**LOAEL**	**NOAEL**	**LOAEL**	**NOAEL**	**LOAEL**	**NOAEL**	**LOAEL**
Inorganics								
COPPER	1.3E-01	1.5E-02	5.3E-02	3.6E-03	3.5E-01	4.0E-02	1.4E-01	9.2E-03
MERCURY	1.9E+00	1.9E-01	2.3E-01	4.5E-02	1.3E+01	1.3E+00	1.6E+00	3.2E-01
NICKEL	2.8E-02	1.0E-02	3.8E-02	4.4E-03	5.4E-01	1.9E-01	1.2E+00	1.4E-01
ZINC	4.6E-02	1.8E-02	2.4E-02	6.1E-03	6.4E-01	2.5E-01	3.3E-01	8.5E-02

Cells are shaded if the value is greater than 1.0
Only chemicals with EEQs > 1.0 in the conservative food chain model are presented in this table.

NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
EEQ - Ecological Effects Quotient

APPENDIX L
TABLE 7-4

SURFACE SOIL FREQUENCY OF DETECTION
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	frequency	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c	max_c
Explosives (mg/kg)																						
121-14-2	2,4-Dinitrotoluene	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	4/50	0.19	2	0.19	2	0.062	0.25	0.062	0.25
2691-41-0	Hmx	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	5/50	0.19	0.2	0.19	0.2	0.94	18.3	0.94	18.3
55-63-0	**Nitroglycerin**	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	6/50	1.1	1.2	1.1	1.2	0.087	0.94	0.087	0.94
Inorganics (mg/kg)																						
7429-90-5	**Aluminum**	19700	7700	7700	7800	NA	10	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	3610	32400	3610	32400
7440-36-0	Antimony	NA	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	7/50	0.032	0.16	0.032	0.16	0.037	0.12	0.037	0.12
7440-38-2	**Arsenic**	14.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	0.82	15.7	0.82	15.7
7440-39-3	Barium	80.4	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	25.9	113	25.9	113
7440-41-7	Beryllium	1.1	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	0.29	1	0.29	1
7440-43-9	Cadmium	2.5	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	25/50	0.08	0.17	0.08	0.17	0.098	1.2	0.098	1.2
7440-70-2	Calcium	2060	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	50/50	0	0	0	0	121	3230	121	3230
7440-47-3	Chromium	33.4	26	12000	12000	2000000000	26	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	10.6	26.6	10.6	26.6
7440-48-4	Cobalt	22.3	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	2.4	22	2.4	22
7440-50-8	**Copper**	20.3	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	6.1	60.1	6.1	60.1
7439-89-6	Iron	38500	5500	5500	5500	NA	11	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	7470	29400	7470	29400
7439-92-1	Lead	62.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	7.4	40.3	7.4	40.3
7439-93-2	Lithium	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	50/50	0	0	0	0	4.4	25.4	4.4	25.4
7439-95-4	Magnesium	1620	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	50/50	0	0	0	0	433	2960	433	2960
7439-96-5	**Manganese**	1390	160	180	160	950	220	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	58.7	1700	58.7	1700
7439-97-6	**Mercury**	0.16	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	50/50	0	0	0	0	0.01	1.2	0.01	1.2
7440-02-0	**Nickel**	15.4	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	7.1	230	7.1	230
7440-09-7	Potassium	1470	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	50/50	0	0	0	0	697	2110	697	2110
7782-49-2	Selenium	1.2	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	22/50	0.032	0.066	0.032	0.066	0.044	0.42	0.044	0.42
7440-22-4	Silver	0.84	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	6/50	0.08	0.17	0.08	0.17	0.14	4	0.14	4
7440-23-5	Sodium	120	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	50/50	0	0	0	0	12.6	70.3	12.6	70.3
7440-24-6	Strontium	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	50/50	0	0	0	0	4.7	13.6	4.7	13.6
7440-31-5	Tin	NA	0.89	4700	4700	NA	NA	0.89	NC	NC	NC	NC	NC	1/50	0.8	1.7	0.8	1.7	1.1	1.1	1.1	1.1
7440-62-2	Vanadium	53.3	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	16.7	43.7	16.7	43.7
7440-66-6	**Zinc**	37.5	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	50/50	0	0	0	0	16.1	73.6	16.1	73.6
Miscellaneous Parameters																						
TTNUS014	Cation Exchange Capacity (MEQ/100)			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1/1	0	0	0	0	89	89	89	89
TTNUS288	Percent Moisture (%)			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1/1	0	0	0	0	1.8	1.8	1.8	1.8
TTNUS002	PH (s.u.)	8.8		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	7/7	0	0	0	0	5.28	7.38	5.28	7.38
TTNUS003	Total Organic Carbon (mg/kg)	57200		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1/1	0	0	0	0	4770	4770	4770	4770
TTNUS046	**Total Solids (%)**	79.2		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1/1	0	0	0	0	98.2	98.2	98.2	98.2

Associated Samples:

X05SS0010006,DUP	X05SS0040006,NORMAL	X05SS0090006,NORMAL	X05SS0140006,NORMAL	X05SS0190006,NORMAL	X05SS0230006,NORMAL
X05SS0010006-AVG,AVG	X05SS0040024,NORMAL	X05SS0090024,NORMAL	X05SS0140024,NORMAL	X05SS0190024,NORMAL	X05SS0230024,NORMAL
X05SS0010006-D,DUP	X05SS0050006,NORMAL	X05SS0100006,NORMAL	X05SS0150006,NORMAL	X05SS0200006,NORMAL	X05SS0240006,NORMAL
X05SS0010024,NORMAL	X05SS0050024,NORMAL	X05SS0100024,NORMAL	X05SS0150024,NORMAL	X05SS0200024,NORMAL	X05SS0240024,NORMAL
X05SS0020006,NORMAL	X05SS0060006,NORMAL	X05SS0110006,NORMAL	X05SS0160006,NORMAL	X05SS0210006,DUP	X05SS0250006,NORMAL
X05SS0020024,NORMAL	X05SS0060024,NORMAL	X05SS0110024,NORMAL	X05SS0160024,NORMAL	X05SS0210006-AVG,AVG	X05SS0250024,NORMAL
X05SS0030006,NORMAL	X05SS0070006,NORMAL	X05SS0120006,NORMAL	X05SS0170006,NORMAL	X05SS0210006-D,DUP	
X05SS0030024,DUP	X05SS0070024,NORMAL	X05SS0120024,NORMAL	X05SS0170024,NORMAL	X05SS0210024,NORMAL	
X05SS0030024-AVG,AVG	X05SS0080006,NORMAL	X05SS0130006,NORMAL	X05SS0180006,NORMAL	X05SS0220006,NORMAL	
X05SS0030024-D,DUP	X05SS0080024,NORMAL	X05SS0130024,NORMAL	X05SS0180024,NORMAL	X05SS0220024,NORMAL	

APPENDIX L
TABLE 7-4

SURFACE SOIL FREQUENCY OF DETECTION
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
J		0.062 - 0.25	0.19 - 2	X05SS0190006	0.1605	0.12219
K	K	0.94 - 18.3	0.19 - 0.2	X05SS0150006	6.508	0.74015
J	J	0.087 - 0.94	1.1 - 1.2	X05SS0150006	0.287667	0.55902
		3610 - 32400	0	X05SS0020024	12454.2	12454.2
J	J	0.037 - 0.12	0.032 - 0.16	X05SS0090024/X05SS0220006	0.072286	0.03555
L	L	0.82 - 15.7	0	X05SS0090024	3.21	3.21
K	K	25.9 - 113	0	X05SS0220024	54.398	54.398
J	L	0.29 - 1	0	X05SS0030024-D	0.5707	0.5707
J		0.098 - 1.2	0.08 - 0.17	X05SS0200006	0.40002	0.22525
K	K	121 - 3230	0	X05SS0190006	725.14	725.14
K	K	10.6 - 26.6	0	X05SS0010024	17.383	17.383
L	L	2.4 - 22	0	X05SS0030024-D	9.066	9.066
		6.1 - 60.1	0	X05SS0190006	16.194	16.194
		7470 - 29400	0	X05SS0010024	15230.2	15230.2
L		7.4 - 40.3	0	X05SS0220006	17.676	17.676
L		4.4 - 25.4	0	X05SS0010024	13.145	13.145
		433 - 2960	0	X05SS0080006	1117.48	1117.48
		58.7 - 1700	0	X05SS0030024	377.889	377.889
J		0.01 - 1.2	0	X05SS0100006	0.11406	0.11406
L	L	7.1 - 230	0	X05SS0140006	18.957	18.957
		697 - 2110	0	X05SS0010024	1318.06	1318.06
L	L	0.044 - 0.42	0.032 - 0.066	X05SS0090024	0.138659	0.07536
J		0.14 - 4	0.08 - 0.17	X05SS0030006	1.155	0.180255
J	L	12.6 - 70.3	0	X05SS0030024-D	37.665	37.665
K	L	4.7 - 13.6	0	X05SS0090024	7.515	7.515
K	K	1.1	0.8 - 1.7	X05SS0100024	1.1	0.51625
K	K	16.7 - 43.7	0	X05SS0020024	27.971	27.971
L		16.1 - 73.6	0	X05SS0030006	37.937	37.937
		89	0	X05SS0110024	89	89
		1.8	0	X05SS0110024	1.8	1.8
		5.28 - 7.38	0	X05SS0210024	6.251429	6.251429
		4770	0	X05SS0110024	4770	4770
		98.2	0	X05SS0110024	98.2	98.2

APPENDIX L
TABLE 7-5

SURFACE SOILS (0 to 0.5 feet) FREQUENCY OF DETECTION
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	frequency	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c
Explosives (mg/kg)																					
121-14-2	2,4-Dinitrotoluene	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	1/25	0.19	2	0.19	2	0.25	0.25	0.25
2691-41-0	**Hmx**	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	3/25	0.19	0.2	0.19	0.2	0.94	18.3	0.94
55-63-0	**Nitroglycerin**	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	4/25	1.2	1.2	1.2	1.2	0.099	0.94	0.099
Inorganics (mg/kg)																					
7429-90-5	Aluminum	19700	7700	7700	7800	NA	10	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	3610	18900	3610
7440-36-0	Antimony	NA	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	4/25	0.033	0.16	0.033	0.16	0.042	0.12	0.042
7440-38-2	Arsenic	14.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	0.88	9.3	0.88
7440-39-3	Barium	80.4	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	25.9	92.4	25.9
7440-41-7	Beryllium	1.1	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	0.29	0.82	0.29
7440-43-9	Cadmium	2.5	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	14/25	0.08	0.17	0.08	0.17	0.098	1.2	0.098
7440-70-2	**Calcium**	2060	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	25/25	0	0	0	0	156	3230	156
7440-47-3	Chromium	33.4	26	12000	12000	2E+09	26	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	10.8	25.5	10.8
7440-48-4	Cobalt	22.3	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	2.4	20.4	2.4
7440-50-8	**Copper**	20.3	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	6.2	60.1	6.2
7439-89-6	Iron	38500	5500	5500	5500	NA	11	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	8090	24600	8090
7439-92-1	Lead	62.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	8.1	40.3	8.1
7439-93-2	**Lithium**	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	25/25	0	0	0	0	4.4	21.5	4.4
7439-95-4	Magnesium	1620	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	25/25	0	0	0	0	508	2960	508
7439-96-5	Manganese	1390	160	180	160	950	220	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	68.5	1310	68.5
7439-97-6	**Mercury**	0.16	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	25/25	0	0	0	0	0.01	1.2	0.01
7440-02-0	**Nickel**	15.4	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	7.1	230	7.1
7440-09-7	**Potassium**	1470	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	25/25	0	0	0	0	772	1920	772
7782-49-2	Selenium	1.2	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	14/25	0.032	0.066	0.032	0.066	0.044	0.3	0.044
7440-22-4	Silver	0.84	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	3/25	0.08	0.16	0.08	0.16	0.37	4	0.37
7440-23-5	Sodium	120	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	25/25	0	0	0	0	12.6	66.9	12.6
7440-24-6	Strontium	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	25/25	0	0	0	0	4.7	11	4.7
7440-24-6	Strontium	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	25/25	0	0	0	0	4.7	11	4.7
7440-24-6	Strontium	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	25/25	0	0	0	0	4.7	11	4.7
7440-62-2	Vanadium	53.3	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	16.8	40.1	16.8
7440-66-6	**Zinc**	37.5	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	25/25	0	0	0	0	18.7	73.6	18.7
Miscellaneous Parameters																					
TTNUS002	**Ph**	8.8		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3/3	0	0	0	0	5.61	6.96	5.61

Associated Samples:

X05SS0010006,DUP
X05SS0010006-AVG,AVG
X05SS0010006-D,DUP
X05SS0020006,NORMAL
X05SS0030006,NORMAL
X05SS0040006,NORMAL
X05SS0050006,NORMAL
X05SS0060006,NORMAL
X05SS0070006,NORMAL
X05SS0080006,NORMAL
X05SS0090006,NORMAL
X05SS0100006,NORMAL
X05SS0110006,NORMAL
X05SS0120006,NORMAL
X05SS0130006,NORMAL
X05SS0140006,NORMAL
X05SS0150006,NORMAL
X05SS0160006,NORMAL
X05SS0170006,NORMAL
X05SS0180006,NORMAL
X05SS0190006,NORMAL
X05SS0200006,NORMAL
X05SS0210006,DUP
X05SS0210006-AVG,AVG
X05SS0210006-D,DUP
X05SS0220006,NORMAL
X05SS0230006,NORMAL
X05SS0240006,NORMAL
X05SS0250006,NORMAL

APPENDIX L
TABLE 7-5

SURFACE SOILS (0 to 0.5 feet) FREQUENCY OF DETECTION
ADVANCED IED AREA (UXO-05)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
0.25			0.25	0.19 - 2	X05SS0190006	0.25	0.1414
18.3	K	K	0.94 - 18.3	0.19 - 0.2	X05SS0150006	7.78	1.021
0.94	J	J	0.099 - 0.94	1.2	X05SS0150006	0.35475	0.56076
18900		J	3610 - 18900	0	X05SS0130006	11984	11984
0.12	J	L	0.042 - 0.12	0.033 - 0.16	X05SS0220006	0.06825	0.03767
9.3	L	L	0.88 - 9.3	0	X05SS0030006	3.1232	3.1232
92.4	K	K	25.9 - 92.4	0	X05SS0030006	48.924	48.924
0.82	J		0.29 - 0.82	0	X05SS0120006	0.5284	0.5284
1.2	J		0.098 - 1.2	0.08 - 0.17	X05SS0200006	0.4645	0.28292
3230	K	K	156 - 3230	0	X05SS0190006	854.54	854.54
25.5	K	K	10.8 - 25.5	0	X05SS0080006	16.714	16.714
20.4	L		2.4 - 20.4	0	X05SS0010006	8.638	8.638
60.1			6.2 - 60.1	0	X05SS0190006	16.366	16.366
24600			8090 - 24600	0	X05SS0160006	14469.6	14469.6
40.3	L		8.1 - 40.3	0	X05SS0220006	20.108	20.108
21.5	L		4.4 - 21.5	0	X05SS0160006	12.17	12.17
2960			508 - 2960	0	X05SS0080006	1078.28	1078.28
1310			68.5 - 1310	0	X05SS0030006	389.398	389.398
1.2	J		0.01 - 1.2	0	X05SS0100006	0.1465	0.1465
230	L	L	7.1 - 230	0	X05SS0140006	21.708	21.708
1920			772 - 1920	0	X05SS0240006	1250.32	1250.32
0.3	L	L	0.044 - 0.3	0.032 - 0.066	X05SS0160006	0.128571	0.08248
4			0.37 - 4	0.08 - 0.16	X05SS0030006	1.633333	0.23669
66.9	J	K	12.6 - 66.9	0	X05SS0030006	35.496	35.496
11	K	K	4.7 - 11	0	X05SS0030006	7.48	7.48
11	K	K	4.7 - 11	0	X05SS0190006	7.48	7.48
11	K	K	4.7 - 11	0	X05SS0200006	7.48	7.48
40.1	K	K	16.8 - 40.1	0	X05SS0020006	27.866	27.866
73.6	L		18.7 - 73.6	0	X05SS0030006	38.506	38.506
6.96			5.61 - 6.96	0	X05SS0210006	6.453333	6.453333

APPENDIX L
TABLE 8-1

SEDIMENT (>2 feet) FREQUENCY OF DETECTION
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	frequency	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c	max_c
Explosives (mg/kg)																						
55-63-0	**Nitroglycerin**	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	2/29	1.1	1.2	1.1	1.2	0.19	0.91	0.19	0.91
Miscellaneous Parameters																						
TTNUS014	Cation Exchange Capacity (MEQ/kg)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	109	232	109	232
TTNUS288	Percent Moisture (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	26.5	86.2	26.5	86.2
TTNUS291	Percent Solids (%)	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	13.8	73.5	13.8	73.5
TTNUS002	PH (s.u.)	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	6.4	7.14	6.4	7.14
TTNUS003	**Total Organic Carbon (mg/kg)**	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	4820	327000	4820	327000

Associated Samples: > 2 FEET

X10SD0010204,NORMAL
X10SD0010405,NORMAL
X10SD0020204,NORMAL
X10SD0020405,DUP
X10SD0020405-AVG,AVG
X10SD0020405-D,DUP
X10SD0030204,NORMAL
X10SD0030405,NORMAL
X10SD0040204,NORMAL
X10SD0040405,NORMAL
X10SD0050204,NORMAL
X10SD0050405,NORMAL
X10SD0060204,NORMAL
X10SD0060405,NORMAL
X10SD0070204,NORMAL
X10SD0070405,NORMAL
X10SD0080204,NORMAL
X10SD0080405,NORMAL
X10SD0090204,NORMAL
X10SD0090405,NORMAL
X10SD0100204,NORMAL
X10SD0110204,NORMAL
X10SD0110405,NORMAL
X10SD0120204,NORMAL
X10SD0120405,NORMAL
X10SD0130204,NORMAL
X10SD0130405,NORMAL
X10SD0140204,NORMAL
X10SD0140405,NORMAL
X10SD0150204,DUP
X10SD0150204-AVG,AVG
X10SD0150204-D,DUP
X10SD0150406,NORMAL

APPENDIX L
TABLE 8-1

SEDIMENT (>2 feet) FREQUENCY OF DETECTION
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
J	J	0.19 - 0.91	1.1 - 1.2	X10SD0030204	0.55	0.5931
		109 - 232	0	X10SD0130204	170.5	170.5
		26.5 - 86.2	0	X10SD0130204	56.35	56.35
		13.8 - 73.5	0	X10SD0130405	43.65	43.65
		6.4 - 7.14	0	X10SD0130405	6.77	6.77
		4820 - 327000	0	X10SD0130204	165910	165910

APPENDIX L
TABLE 8-2

SEDIMENT (<2 feet) FREQUENCY OF DETECTION
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND
Page 1 of 2

cas	parameter	frequency	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c
Explosives (mg/kg)																					
55-63-0	Nitroglycerin	5/30	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	1.2	1.2	1.2	1.2	0.087	0.53	0.087
Miscellaneous Parameters																					
TTNUS014	Cation Exchange Capacity (MEQ/kg)	1/1	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	0	0	0	0	175	175	175
TTNUS288	Percent Moisture (%)	1/1	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	0	0	0	0	83.4	83.4	83.4
TTNUS291	Percent Solids(%)	1/1	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	0	0	0	0	16.6	16.6	16.6
TTNUS002	PH (s.u.)	1/1	8.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	0	0	0	0	6.53	6.53	6.53
TTNUS003	**Total Organic Carbon (mg/kg)**	1/1	57200	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	0	0	0	0	137000	137000	137000

Associated Samples: < 2 FEET

X10SD0010006,NORMAL	X10SD0080024,NORMAL	X10SD0150006,NORMAL
X10SD0010024,NORMAL	X10SD0090006,NORMAL	X10SD0150024,NORMAL
X10SD0020006,NORMAL	X10SD0090024,DUP	
X10SD0020024,NORMAL	X10SD0090024-AVG,AVG	
X10SD0030006,NORMAL	X10SD0090024-D,DUP	
X10SD0030024,NORMAL	X10SD0100006,NORMAL	
X10SD0040006,NORMAL	X10SD0100024,NORMAL	
X10SD0040024,NORMAL	X10SD0110006,NORMAL	
X10SD0050006,NORMAL	X10SD0110024,NORMAL	
X10SD0050024,NORMAL	X10SD0120006,NORMAL	
X10SD0060006,NORMAL	X10SD0120024,NORMAL	
X10SD0060024,NORMAL	X10SD0130006,NORMAL	
X10SD0070006,NORMAL	X10SD0130024,NORMAL	
X10SD0070024,NORMAL	X10SD0140006,NORMAL	
X10SD0080006,NORMAL	X10SD0140024,NORMAL	

APPENDIX L
TABLE 8-2

SEDIMENT (<2 feet) FREQUENCY OF DETECTION
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
0.53	J	J	0.087 - 0.53	1.2	X10SD0120006	0.3154	0.55257
175			175	0	X10SD0150024	175	175
83.4			83.4	0	X10SD0150024	83.4	83.4
16.6			16.6	0	X10SD0150024	16.6	16.6
6.53			6.53	0	X10SD0150024	6.53	6.53
137000			137000	0	X10SD0150024	137000	137000

APPENDIX L
TABLE 8-3

SEDIMENT (0 to 0.5 feet) FREQUENCY OF DETECTION
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIANHEAD MARYLAND

cas	parameter	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	frequency	min_ndc	max_ndc	min_nd	max_nd
Explosives (mg/kg)																		
55-63-0	Nitroglycerin	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	5/15	1.2	1.2	1.2	1.2

Associated Samples < 0.5 FEET

X10SD0010006,NORMAL
X10SD0020006,NORMAL
X10SD0030006,NORMAL
X10SD0040006,NORMAL
X10SD0050006,NORMAL
X10SD0060006,NORMAL
X10SD0070006,NORMAL
X10SD0080006,NORMAL
X10SD0090006,NORMAL
X10SD0100006,NORMAL
X10SD0110006,NORMAL
X10SD0120006,NORMAL
X10SD0130006,NORMAL
X10SD0140006,NORMAL
X10SD0150006,NORMAL

APPENDIX L
TABLE 8-3

SEDIMENT (0 to 0.5 feet) FREQUENCY OF DETECTION
STUMP NECK IMPACT AREA (UXO-10)
NAVAL SUPPORT FACILITY
INDIANHEAD MARYLAND

min	max	min_c	max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
0.087	0.53	0.087	0.53	J	J	0.087 - 0.53	1.2	X10SD0120006	0.3154	0.50513

APPENDIX L
TABLE 10-1

SURFACE SOIL FREQUENCY OF DETECTION
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	frequency	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c	max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos
	Miscellaneous Parameters															
TTNUS014	Cation Exchange Capacity (MEQ/kg)	3/3	0	0	0	0	42.7	74	42.7	74			42.7 - 74	0	X21SS0100006	59.666667
TTNUS288	Percent Moisture	3/3	0	0	0	0	17.7	22.8	17.7	22.8			17.7 - 22.8	0	X21SS0100006	19.666667
TTNUS002	PH (s.u.)	3/3	0	0	0	0	4.73	5.16	4.73	5.16			4.73 - 5.16	0	X21SS0100006	4.933333
TTNUS003	Total Organic Carbon (mg/kg)	3/3	0	0	0	0	2470	9460	2470	9460		J	2470 - 9460	0	X21SS0100006	5596.666667
TTNUS046	Total Solids (%)	3/3	0	0	0	0	77.2	82.3	77.2	82.3			77.2 - 82.3	0	X21SS0070024	80.333333

Associated Samples:

X21SS0010006,NORMAL
X21SS0010024,NORMAL
X21SS0020006,NORMAL
X21SS0020024,NORMAL
X21SS0030006,NORMAL
X21SS0030024,NORMAL
X21SS0040006,NORMAL
X21SS0040024,NORMAL
X21SS0050006,NORMAL
X21SS0050024,NORMAL
X21SS0060006,NORMAL
X21SS0060024,NORMAL
X21SS0070006,NORMAL
X21SS0070024,NORMAL
X21SS0080006,NORMAL
X21SS0080024,NORMAL
X21SS0090006,NORMAL
X21SS0090024,NORMAL
X21SS0100006,NORMAL
X21SS0100024,NORMAL
X21SS0110006,NORMAL
X21SS0110024,NORMAL
X21SS0120006,NORMAL
X21SS0120024,NORMAL
X21SS0130006,NORMAL
X21SS0130024,NORMAL
X21SS0140006,DUP
X21SS0140006-AVG,AVG
X21SS0140006-D,DUP
X21SS0140024,NORMAL
X21SS0150006,NORMAL
X21SS0150024,NORMAL
X21SS0160006,NORMAL
X21SS0160024,NORMAL
X21SS0170006,NORMAL
X21SS0170024,NORMAL
X21SS0180006,NORMAL
X21SS0180024,DUP
X21SS0180024-AVG,AVG
X21SS0180024-D,DUP
X21SS0190006,NORMAL
X21SS0190024,NORMAL
X21SS0200006,NORMAL
X21SS0200024,NORMAL
X21SS0210006,NORMAL

APPENDIX L
TABLE 10-1

SURFACE SOIL FREQUENCY OF DETECTION
TEST AREA 1 (UXO-21)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

avg_all	utl95cv	minorpal	ornl	ornl_b	mdres	mdsgw	ssl	btag	oplnt	oinv	sunpl	sunin	lanl
59.666667	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
19.666667	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4.933333	8.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5596.666667	57200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
80.333333	79.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX L
TABLE 13-1

SURFACE SOIL COPC SELECTION
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Frequency of Detection	Minimum Concentration (1)	Maximum Concentration (1)	Location of Maximum Concentration (1)	Average of Positive Results (1)	Average of All Results (1)	Background 95% UCL	Ecological Effects Quotient (2)				Maximum Greater than Background?	Rationale for Invertebrate/Plant Deletion or Selection	Retain for Food Chain Modeling?
								Invertebrates (3)	Plants (3)	Avian (4)	Mammals (4)			
Explosives (mg/kg)														
RDX	1/20	1.3	1.3	X28SS0190006	1.3	0.205	NA	NA	NA	NA	NA	NA	NSL	NO
Inorganics (mg/kg)														
Aluminum	20/20	3820	18200	X28SS0180006	10725.75	10725.75	19700	pH	pH	NA	NA	NO	BKG/BSL	NO
Antimony	13/20	0.033 J	2.3 L	X28SS0100006	0.352385	0.239563	NA	0.0295	0.4600	NA	8.5185	NA	BSL	NO
Arsenic	20/20	0.94 L	8 L	X28SS0150006	2.8145	2.8145	14.9	0.1333	0.4444	0.1860	0.1739	NO	BKG/BSL	NO
Barium	20/20	41.4 K	114	X28SS0100006	59	59	80.4	0.3455	0.2280	0.2591	0.0570	YES	BSL	NO
Beryllium	20/20	0.46 J	0.81	X28SS0010006	0.59675	0.59675	1.1	0.0203	0.0810	NA	0.0386	NO	BKG/BSL	NO
Cadmium	10/20	0.082 J	0.78	X28SS0100006	0.2297	0.135138	2.5	0.0056	0.0244	1.0130	2.1667	NO	BKG/BSL	NO
Calcium	20/20	241 K	13700	X28SS0010006	1829.6	1829.6	2060	NA	NA	NA	NA	YES	NUT	NO
Chromium	20/20	13.6 K	40	X28SS0030006	21.715	21.715	33.4	0.6250	0.6250	1.5385	1.1765	YES	BSL	YES
Cobalt	20/20	3.2	10.3	X28SS0010006	5.2625	5.2625	22.3	0.0515	0.7923	0.0858	0.0448	NO	BKG/BSL	NO
Copper	20/20	4.8 J	50 J	X28SS0100006	18.8525	18.8525	20.3	0.6250	0.7143	1.7857	1.0204	YES	BSL	YES
Iron	20/20	7140 J	19400	X28SS0010006	12500	12500	38500	NA	pH	NA	NA	NO	BKG	NO
Lead	20/20	12.1 J	198	X28SS0070006	47.7925	47.7925	62.5	0.1165	1.6500	18.0000	3.5357	YES	ASL	YES
Lithium	20/20	5.2 J	16.5	X28SS0180006	8.85	8.85	NA	NA	8.2500	NA	NA	NA	ASL/NSL	NO
Magnesium	20/20	800 J	7480	X28SS0030006	1818.55	1818.55	1620	NA	NA	NA	NA	YES	NUT	NO
Manganese	20/20	121	673	X28SS0100006	271.95	271.95	1390	1.4956	3.0591	0.1565	0.1683	NO	BKG	NO
Mercury	19/20	0.015 J	0.85	X28SS0180006	0.0845	0.080975	0.16	0.0708	0.0708	14.6552	0.5380	YES	BSL	YES
Nickel	20/20	5.9 J	34.5	X28SS0030006	12.6525	12.6525	15.4	0.1232	0.9079	0.1643	0.2654	YES	BSL	NO
Potassium	20/20	676 J	1940	X28SS0030006	1283.55	1283.55	1470	NA	NA	NA	NA	YES	NUT	NO
Selenium	6/20	0.054 J	0.21 L	X28SS0100006	0.091542	0.044563	1.2	0.0512	0.4038	0.1750	0.3333	NO	BKG/BSL	NO
Silver	6/20	0.093 J	19.5 J	X28SS0050006	2.376083	0.7435	0.84	NA	0.0348	4.6429	1.3929	YES	BSL	YES
Sodium	20/20	17.1 J	200	X28SS0010006	43.79	43.79	120	NA	NA	NA	NA	YES	NUT	NO
Strontium	20/20	4.1	32	X28SS0010006	10.0125	10.0125	NA	0.2667	0.2667	0.2667	0.2667	NA	BSL	NO
Vanadium	20/20	15.9 J	36.6 K	X28SS0180006	25.885	25.885	53.3	0.2815	0.2815	4.6923	0.1307	NO	BKG/BSL	NO
Zinc	20/20	21.9 K	464	X28SS0100006	63.4075	63.4075	37.5	3.8667	2.9000	10.0870	5.8734	YES	ASL	YES
Miscellaneous Parameters														
Cation Exchange Capacity	2/2	49	127	X28SS0200006	88	88	NA	NA	NA	NA	NA	NA	NA	NA
Percent Moisture	2/2	25	36.1	X28SS0200006	30.55	30.55	NA	NA	NA	NA	NA	NA	NA	NA
Ph	2/2	5.52	5.8	X28SS0200006	5.66	5.66	8.8	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	2/2	12000	18100	X28SS0040006	15050	15050	NA	NA	NA	NA	NA	NA	NA	NA
Total Solids	2/2	63.9	75	X28SS0040006	69.45	69.45	NA	NA	NA	NA	NA	NA	NA	NA
pH	2/2	5.52	5.8	X28SS0200006	5.66	5.66	8.8	NA	NA	NA	NA	NA	NA	NA

-shading of the chemical name indicates the chemical was retianed as a COPC for soil invertebrates or plants.

1 - Sample and duplicate were considered as two separate samples when determining the minimum and maximum concentrations, but were averaged and considered one sample for average calculations.

2 - Ecological effects quotients were calculated by dividing the maximum detected concentration by the COPC screening level. Values are unitless. The screening levels are provided in Appendix L Table titled "Soil Ecological Screening Levels".

3 - Cells are shaded for plants/invertebrates if the EEQ > 1; the chemical was retained as a COPC for plants/invertebrates if the maximum concentration is > background and the EEQ > 1 or a screening level was not available for that receptor.

4 - Shading for wildlife receptors indicates that the chemical exceded the screening level and was retained for food chain modeling if the maximum concentration was also greater than background. If a screening level was not available for wildlife receptors, the chemical was not retained for food chain modeling unless it is considered to be an important bioaccumulative chemical as indicated in USEPA (2006) or the chemical was retained for the other wildlife receptor.

Rationale Codes
For Selection as a COPC:
ASL = Above COPC screening level
NSL = No screening level
For Elimination as a COPC:
BSL = Below COPC screening level
NUT = Essential nutrient
BKG = Maximum less than Background

Associated Samples:

X28SS0010006,NORMAL	X28SS0050006-AVG,AVG	X28SS0090006,NORMAL	X28SS0140006,NORMAL	X28SS0190006,NORMAL
X28SS0020006,NORMAL	X28SS0050006-D,DUP	X28SS0100006,NORMAL	X28SS0150006,NORMAL	X28SS0200006,NORMAL
X28SS0030006,NORMAL	X28SS0060006,NORMAL	X28SS0110006,NORMAL	X28SS0160006,NORMAL	
X28SS0040006,NORMAL	X28SS0070006,NORMAL	X28SS0120006,NORMAL	X28SS0170006,NORMAL	
X28SS0050006,DUP	X28SS0080006,NORMAL	X28SS0130006,NORMAL	X28SS0180006,NORMAL	

APPENDIX L
TABLE 13-2

TERRESTRIAL FOOD CHAIN MODEL - CONSERVATIVE SCENARIO
INSECTIVOROUS AND HERBIVOROUS RECEPTORS
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Herbivorous Receptors EEQs				Insectivorous Receptors EEQs			
	Bobwhite Quail		Meadow Vole		American Robin		Short-Tailed Shrew	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics								
CHROMIUM	2.9E-01	4.9E-02	1.3E-01	5.5E-03	1.1E+00	1.9E-01	6.0E-01	2.5E-02
COPPER	4.2E-01	4.9E-02	2.1E-01	1.4E-02	1.4E+00	1.6E-01	5.2E-01	3.5E-02
LEAD	2.1E+00	7.7E-02	2.7E-01	6.8E-03	8.9E+00	3.2E-01	1.4E+00	3.6E-02
MERCURY	1.6E+01	1.6E+00	3.0E+00	6.1E-01	2.9E+01	2.9E+00	3.5E+00	7.0E-01
SILVER	1.6E-01	5.2E-03	1.6E-02	8.4E-04	3.4E+00	1.1E-01	7.2E-01	3.6E-02
ZINC	3.4E-01	1.3E-01	2.3E-01	5.9E-02	1.8E+00	6.7E-01	9.3E-01	2.3E-01

Cells are shaded if the value is greater than 1.0

NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
EEQ - Ecological Effects Quotient

APPENDIX L
TABLE 13-3

TERRESTRIAL FOOD CHAIN MODEL - AVERAGE SCENARIO
INSECTIVOROUS AND HERBIVOROUS RECEPTORS
EOD SCHOOL DEMOLITION ARE (UXO-28)
NAVAL SUPPORT FACILITY
INDIAN HEAD, MARYLAND

Chemical	Herbivorous Receptors EEQs				Insectivorous Receptors EEQs			
	Bobwhite Quail		Meadow Vole		American Robin		Short-Tailed Shrew	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics								
CHROMIUM	6.5E-02	1.1E-02	2.3E-02	9.6E-04	4.5E-01	7.6E-02	2.5E-01	1.0E-02
COPPER	1.4E-01	1.6E-02	5.6E-02	3.8E-03	4.0E-01	4.6E-02	1.6E-01	1.1E-02
LEAD	2.5E-01	9.1E-03	3.0E-02	7.6E-04	1.9E+00	7.0E-02	3.5E-01	8.9E-03
MERCURY	1.04E+00	1.0E-01	1.2E-01	2.5E-02	1.1E+01	1.1E+00	1.3E+00	2.6E-01
SILVER	2.1E-03	7.2E-05	1.6E-04	7.9E-06	1.1E-01	3.8E-03	2.3E-02	1.1E-03
ZINC	6.1E-02	2.4E-02	3.2E-02	8.0E-03	7.5E-01	2.9E-01	3.9E-01	1.0E-01

Cells are shaded if the value is greater than 1.0
Only chemicals with EEQs > 1.0 in the conservative food chain model are presented in this table.

NOAEL - No Observed Adverse Effects Level
LOAEL - Lowest Observed Adverse Effects Level
EEQ - Ecological Effects Quotient

APPENDIX L
TABLE 13-4

RES EXCEEDANCES
EOD DEMOLITION SCHOOL (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

														a01
														001
														X28SS0010006
														X28SB001
														00810_20100422
														X28SS0010006
														20100120
														20100121
														NORMAL
	matrix													SO
	duplicate													
	top_depth													0
	bottom_dep													0.5
	submatrix													SS
cas	sort	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	c_001
	Explosives (mg/kg)													
99-35-4	1,3,5-TRINITROBENZENE	NA	9	220	NA	NA	NA	NA	NA	NA	9	18	NC	2 UJ
99-65-0	1,3-DINITROBENZENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 UJ
118-96-7	2,4,6-TRINITROTOLUENE	NA	**3.6**	**3.6**	NA	NA	NA	NA	NA	NA	6	12	NC	2.5 U
121-14-2	2,4-DINITROTOLUENE	NA	0.57	1.6	16	0.57	NA	NA	NA	NA	6	20	NC	2 U
606-20-2	2,6-DINITROTOLUENE	NA	0.25	6.1	7.8	0.25	NA	NA	NA	NA	5	7	NC	2 U
35572-78-2	2-AMINO-4,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	80	2 U
88-72-2	2-NITROTOLUENE	0.15	2.9	2.9	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 U
618-87-1	3,5-DINITROANILINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	2.5 U
99-08-1	3-NITROTOLUENE	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 U
19406-51-0	4-AMINO-2,6-DINITROTOLUENE	NA	15	15	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 U
99-99-0	4-NITROTOLUENE	0.21	30	30	NA	NA	NA	NA	NA	NA	NC	NC	NC	2 U
2691-41-0	HMX	NA	380	380	NA	NA	NA	NA	NA	NA	9341	600	NC	2 U
98-95-3	NITROBENZENE	NA	0.023	4.8	3.9	0.023	NA	NA	NA	40	NC	NC	NC	2 U
55-63-0	NITROGLYCERIN	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	12 UJ
78-11-5	PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	12 U
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	2 U
479-45-8	TETRYL	NA	24	24	NA	NA	NA	NA	NA	NA	NC	NC	25	2 UR
	Inorganics (mg/kg)													
7429-90-5	ALUMINUM	19700	7700	7700	7800	NA	10	NC	NC	NC	NC	NC	NC	8760 L [PAL] [ORNL] [MDRES] [SSL]
7440-36-0	**ANTIMONY**	NA	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	0.066 UL
7440-38-2	ARSENIC	14.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	3.3 L [PAL] [ORNL] [MDRES] [MDSGW]
7440-39-3	BARIUM	80.4	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	55.7
7440-41-7	BERYLLIUM	1.1	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	0.81
7440-43-9	CADMIUM	2.5	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	0.2 J
7440-70-2	CALCIUM	2060	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	13700 [BKG]
7440-47-3	**CHROMIUM**	33.4	**26**	12000	**12000**	**2000000000**	26	NC	NC	NC	NC	NC	NC	29.2 [PAL] [MDRES] [SSL]
7440-48-4	COBALT	22.3	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	10.3 [PAL] [ORNL]
7440-50-8	**COPPER**	20.3	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	24.3 J [BKG]
7439-89-6	IRON	38500	5500	5500	5500	NA	11	NC	NC	NC	NC	NC	NC	19400 [PAL] [ORNL] [MDRES] [SSL]
7439-92-1	**LEAD**	62.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	24.7 [PAL] [SSL]
7439-93-2	LITHIUM	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	6.2 [PAL] [OPLNT]
7439-95-4	**MAGNESIUM**	1620	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	4400 [BKG]
7439-96-5	MANGANESE	1390	160	180	160	950	220	NC	NC	NC	NC	NC	NC	489 [PAL] [ORNL] [MDRES] [SSL]
7439-97-6	**MERCURY**	0.16	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	0.028 U
7440-02-0	NICKEL	15.4	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	22.9 [BKG]
7440-09-7	POTASSIUM	1470	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	712
7782-49-2	SELENIUM	1.2	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	0.094 J
7440-22-4	SILVER	0.84	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	0.17 UL
7440-23-5	SODIUM	120	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	200 [BKG]
7440-24-6	STRONTIUM	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	32.0
7440-31-5	TIN	NA	0.89	4700	4700	NA	NA	0.89	NC	NC	NC	NC	NC	1.7 U
7440-62-2	VANADIUM	53.3	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	26.2 J [PAL] [MDRES] [SSL]
7440-66-6	**ZINC**	37.5	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	43.3 [BKG]
	Miscellaneous Parameters													
TTNUS014	CATION EXCHANGE CAPACITY (MEQ/100)			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
TTNUS288	PERCENT MOISTURE (%)			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
TTNUS002	PH (S.U.)	**8.8**		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
TTNUS003	TOTAL ORGANIC CARBON (mg/kg)	57200		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
TTNUS046	**TOTAL SOLIDS (%)**	**79.2**		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	

APPENDIX L
TABLE 13-4

RES EXCEEDANCES
EOD DEMOLITION SCHOOL (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

a02	a03	a04	a05	a06
002	003	004	005	006
X28SS0010024	X28SS0020006	X28SS0020024	X28SS0030006	X28SS0030024
X28SB001	X28SB002	X28SB002	X28SB003	X28SB003
00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
X28SS0010024	X28SS0020006	X28SS0020024	X28SS0030006	X28SS0030024
20100120	20100120	20100120	20100120	20100120
20100121	20100121	20100121	20100121	20100121
NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SO	SO	SO	SO	SO
0	0	0	0	0
2	0.5	2	0.5	2
SS	SS	SS	SS	SS
c_002	c_003	c_004	c_005	c_006
0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ	0.2 UJ
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.21 J	1.2 UJ	1.2 UJ	1.2 UJ	1.2 UJ
1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 UR	0.2 UR	0.2 UR	0.2 UR	0.2 UR
9500 L [PAL] [ORNL] [MDRES] [SSL]	11100 L [PAL] [ORNL] [MDRES] [SSL]	7580 L [SSL]	13500 L [PAL] [ORNL] [MDRES] [SSL]	14000 L [PAL] [ORNL] [MDRES] [SSL]
0.036 J	0.063 J	0.032 UL	0.1 J	0.063 UL
2.2 L [PAL] [ORNL] [MDRES] [MDSGW]	2.1 L [PAL] [ORNL] [MDRES] [MDSGW]	1.2 L [PAL] [ORNL] [MDRES] [MDSGW]	2.6 L [PAL] [ORNL] [MDRES] [MDSGW]	2.0 L [PAL] [ORNL] [MDRES] [MDSGW]
34.5	56.8	57.8	65.6	46.5
0.46 J	0.6	0.6	0.58	0.48
0.079 U	0.35	0.13 J	0.16 J	0.085 J
1990	3690 [BKG]	2580 [BKG]	8610 [BKG]	3650 [BKG]
17.1	33.0 [PAL] [MDRES] [SSL]	32.9 [PAL] [MDRES] [SSL]	**40.0 [BKG] [PAL] [MDRES] [SSL]**	22.7
6.2 [PAL] [ORNL]	5.7 [PAL] [ORNL]	5.2 [PAL] [ORNL]	7.2 [PAL] [ORNL]	4.6 [PAL] [ORNL]
7.3 J	12.1 J	9.8 J	15.8 J	6.3 J
12700 [PAL] [ORNL] [MDRES] [SSL]	12100 [PAL] [ORNL] [MDRES] [SSL]	13900 [PAL] [ORNL] [MDRES] [SSL]	12900 [PAL] [ORNL] [MDRES] [SSL]	10700 [PAL] [ORNL] [MDRES] [SSL]
13.4 [PAL] [SSL]	61.2 [PAL] [SSL]	53.2 [PAL] [SSL]	17.7 [PAL] [SSL]	12.9 [PAL] [SSL]
6.5 [PAL] [OPLNT]	9.8 [PAL] [OPLNT]	11.0 [PAL] [OPLNT]	13.1 [PAL] [OPLNT]	8.0 [PAL] [OPLNT]
1590	3030 [BKG]	2330 [BKG]	**7480 [BKG] [PAL] [BTAG]**	2830 [BKG]
158	327 [PAL] [ORNL] [MDRES] [SSL]	198 [PAL] [ORNL] [MDRES]	212 [PAL] [ORNL] [MDRES]	140
0.017 J	0.053	0.018 J	0.045 J	0.025 J
14.3	24.7 [BKG]	18.1 [BKG]	34.5 [BKG]	15.1
750	1180	1300	1940 [BKG]	1140
0.032 J	0.081 J	0.032 UL	0.066 UL	0.032 UL
0.079 UL	0.081 UL	0.082 UL	0.083 UL	0.079 UL
94.0	70.0	71.4	80.9	33.4
7.4	12.3	10.4 K	14.1	8.3
0.79 U	0.81 U	0.83 U	0.83 U	0.79 U
21.1 J [PAL] [MDRES] [SSL]	32.1 J [PAL] [MDRES] [SSL]	31.1 J [PAL] [MDRES] [SSL]	29.0 J [PAL] [MDRES] [SSL]	20.5 J [PAL] [MDRES] [SSL]
24.2	**55.2 [BKG] [PAL] [SSL]**	40.5 [BKG]	**56.5 [BKG] [PAL] [SSL]**	33.1

APPENDIX L
TABLE 13-4

RES EXCEEDANCES
EOD DEMOLITION SCHOOL (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

a07	a08	a09	a10	a11
007	008	009	010	011
X28SS0040006	X28SS0040024	X28SS0050006	X28SS0050006-D	X28SS0050024
X28SB004	X28SB004	X28SB005	X28SB005	X28SB005
00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
X28SS0040006	X28SS0040024	X28SS0050006	FD012110-02	X28SS0050024
20100121	20100121	20100121	20100121	20100121
20100121	20100121	20100121	20100121	20100121
NORMAL	NORMAL	ORIG	DUP	NORMAL
SO	SO	SO	SO	SO
			X28SS0050006	
0	0	0	0	0
0.5	2	0.5	0.5	2
SS	SS	SS	SS	SS
c_007	c_008	c_009	c_010	c_011
0.2 U	0.2 U	0.2 UJ	0.2 U	0.2 UJ
0.2 U	0.2 U	0.2 UJ	0.2 U	0.2 UJ
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1.2 U	1.2 U	1.2 UJ	1.2 U	1.2 UJ
1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 UR	0.2 U	0.2 UR
9000 [PAL] [ORNL] [MDRES] [SSL]	13000 [PAL] [ORNL] [MDRES] [SSL]	7670 L [SSL]	8180 [PAL] [ORNL] [MDRES] [SSL]	11000 L [PAL] [ORNL] [MDRES] [SSL]
0.14 L	0.065 UL	0.032 UL	0.033 U	0.032 UL
1.9 [PAL] [ORNL] [MDRES] [MDSGW]	2.0 [PAL] [ORNL] [MDRES] [MDSGW]	1.2 L [PAL] [ORNL] [MDRES] [MDSGW]	1.6 [PAL] [ORNL] [MDRES] [MDSGW]	1.9 L [PAL] [ORNL] [MDRES] [MDSGW]
52.6 K	75.6 K	50.6	62.2	53.8
0.6	0.84	0.5	0.63	0.55
0.23 J	0.1 J	0.082 U	0.081 U	0.08 U
610 K	399 K	297 J	513 J	426
14.6 K	15.5 K	13.7	18.5	15.8
4.6 [PAL] [ORNL]	6.4 [PAL] [ORNL]	3.2 [PAL] [ORNL]	5.3 [PAL] [ORNL]	3.5 [PAL] [ORNL]
8.8 J	6.7 J	6.6 J	**33.1 J [BKG] [PAL] [SSL]**	5.8 J
9010 [PAL] [ORNL] [MDRES] [SSL]	9520 [PAL] [ORNL] [MDRES] [SSL]	7140 J [PAL] [ORNL] [MDRES] [SSL]	13800 J [PAL] [ORNL] [MDRES] [SSL]	10200 [PAL] [ORNL] [MDRES] [SSL]
26.5 [PAL] [SSL]	18.2 [PAL] [SSL]	12.1 J [PAL] [SSL]	**189 J [BKG] [PAL] [SSL]**	11.3 [PAL] [SSL]
7.2 [PAL] [OPLNT]	8.6 [PAL] [OPLNT]	5.2 J [PAL] [OPLNT]	9.4 J [PAL] [OPLNT]	6.9 [PAL] [OPLNT]
936	1040	800 J	1360 J	1040
335 [PAL] [ORNL] [MDRES] [SSL]	413 [PAL] [ORNL] [MDRES] [SSL]	302 [PAL] [ORNL] [MDRES] [SSL]	328 [PAL] [ORNL] [MDRES] [SSL]	261 [PAL] [ORNL] [MDRES] [SSL]
0.052	0.031 J	0.019 J	0.024	0.021 J
8.1	9.6	5.9 J	12.6 J	8.3
983	957	676 J	1390 J	894
0.066 U	0.089 J	0.054 J	0.033 U	0.032 UL
0.081 UL	0.081 UL	**19.5 J [BKG] [PAL] [SSL]**	0.093 J	1.8 [BKG]
27.0	30.6	17.1 J	26.3	17.8 J
6.7 K	6.5 K	4.1	6.4	5.1
0.81 U	0.82 U	0.82 U	2.9 [PAL] [BTAG]	0.8 U
24.6 K [PAL] [MDRES] [SSL]	24.8 K [PAL] [MDRES] [SSL]	15.9 J [PAL] [MDRES] [SSL]	28.9 [PAL] [MDRES] [SSL]	21.4 J [PAL] [MDRES] [SSL]
26.3 K	27.1 K	23.6	33.3	25.8
49				
25				
5.52				
18100				
75				

APPENDIX L
TABLE 13-4

RES EXCEEDANCES
EOD DEMOLITION SCHOOL (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND
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a12	a13	a14	a15	a16
012	013	014	015	016
X28SS0060006	X28SS0060024	X28SS0060024-D	X28SS0070006	X28SS0070024
X28SB006	X28SB006	X28SB006	X28SB007	X28SB007
00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
X28SS0060006	X28SS0060024	FD012110-01	X28SS0070006	X28SS0070024
20100121	20100121	20100121	20100121	20100121
20100121	20100121	20100121	20100121	20100121
NORMAL	ORIG	DUP	NORMAL	NORMAL
SO	SO	SO	SO	SO
		X28SS0060024		
0	0	0	0	0
0.5	2	2	0.5	2
SS	SS	SS	SS	SS
c_012	c_013	c_014	c_015	c_016
0.2 UJ	0.2 U	0.2 U	0.2 UJ	0.2 UJ
0.2 UJ	0.2 U	0.2 U	0.2 UJ	0.2 UJ
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1.2 UJ	1.2 U	1.2 U	1.2 UJ	1.2 UJ
1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 UR	0.2 U	0.2 U	0.2 UR	0.2 UR
5130 L [SSL]	13600 [PAL] [ORNL] [MDRES] [SSL]	10300 [PAL] [ORNL] [MDRES] [SSL]	14100 L [PAL] [ORNL] [MDRES] [SSL]	12300 L [PAL] [ORNL] [MDRES] [SSL]
0.032 UL	0.064 J	0.033 U	0.033 J	0.033 UL
0.94 L [PAL] [ORNL] [MDRES] [MDSGW]	3.0 [PAL] [ORNL] [MDRES] [MDSGW]	2.1 [PAL] [ORNL] [MDRES] [MDSGW]	2.6 L [PAL] [ORNL] [MDRES] [MDSGW]	2.1 L [PAL] [ORNL] [MDRES] [MDSGW]
65.3	53.6 K	66.6	61.5	63.9
0.53	0.57	0.66	0.67	0.61
0.083 U	0.081 U	0.083 U	0.081 U	0.083 U
346	328 K	440	345	307
16.5	22.0 K	25.7 [PAL] [MDRES]	20.1	16.3
3.9 [PAL] [ORNL]	3.6 [PAL] [ORNL]	4.9 [PAL] [ORNL]	5.5 [PAL] [ORNL]	4.9 [PAL] [ORNL]
10.3 J	**54.7 J [BKG] [PAL] [SSL]**	9.2 J	**34.9 J [BKG] [PAL] [SSL]**	**29.0 J [BKG] [PAL] [SSL]**
9710 [PAL] [ORNL] [MDRES] [SSL]	15300 [PAL] [ORNL] [MDRES] [SSL]	17500 [PAL] [ORNL] [MDRES] [SSL]	14200 [PAL] [ORNL] [MDRES] [SSL]	11000 [PAL] [ORNL] [MDRES] [SSL]
17.3 [PAL] [SSL]	8.1	11.6 [PAL] [SSL]	**198 [BKG] [PAL] [SSL]**	**122 [BKG] [PAL] [SSL]**
6.6 [PAL] [OPLNT]	10.0 [PAL] [OPLNT]	10.8 [PAL] [OPLNT]	10.4 [PAL] [OPLNT]	8.4 [PAL] [OPLNT]
1110	1440	1680 [BKG]	1440	1170
209 [PAL] [ORNL] [MDRES]	146	181 [PAL] [ORNL] [MDRES]	278 [PAL] [ORNL] [MDRES] [SSL]	302 [PAL] [ORNL] [MDRES] [SSL]
0.015 J	0.025 J	0.022 J	0.035 J	0.024 J
8.0	11.3	14.3	12.8	11.1
1170	1700 [BKG]	1840 [BKG]	1390	1180
0.032 UL	0.066 U	0.036 J	0.032 UL	0.033 UL
1.8 [BKG]	0.24 L	0.43 L	0.081 UL	0.083 UL
20.5 J	22.9 J	25.9	24.8	25.9
5.5	5.9 K	6.9	5.9	5.7
0.83 U	0.81 U	0.83 U	3.1 [PAL] [BTAG]	3.8 [PAL] [BTAG]
21.3 J [PAL] [MDRES] [SSL]	28.7 K [PAL] [MDRES] [SSL]	32.5 [PAL] [MDRES] [SSL]	30.0 J [PAL] [MDRES] [SSL]	23.7 J [PAL] [MDRES] [SSL]
30.3	36.4 K	34.8	33.1	27.5
	48.4			
	16.6			
	5.82			
	4670			
	83.4 [BKG]			

APPENDIX L
TABLE 13-4

RES EXCEEDANCES
EOD DEMOLITION SCHOOL (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

a17	a18	a19	a20	a21
017	018	019	020	021
X28SS0080006	X28SS0080024	X28SS0090006	X28SS0090024	X28SS0100006
X28SB008	X28SB008	X28SB009	X28SB009	X28SB010
00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
X28SS0080006	X28SS0080024	X28SS0090006	X28SS0090024	X28SS0100006
20100120	20100120	20100120	20100120	20100121
20100121	20100121	20100121	20100121	20100121
NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SO	SO	SO	SO	SO
0	0	0	0	0
0.5	2	0.5	2	0.5
SS	SS	SS	SS	SS
c_017	c_018	c_019	c_020	c_021
0.2 UJ	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ
0.2 UJ	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1.2 UJ	1.2 U	1.2 UJ	1.2 UJ	1.2 UJ
1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 UR	0.2 U	0.2 UR	0.2 UR	0.2 UR
17300 L [PAL] [ORNL] [MDRES] [SSL]	17600 L [PAL] [ORNL] [MDRES] [SSL]	10100 L [PAL] [ORNL] [MDRES] [SSL]	10000 L [PAL] [ORNL] [MDRES] [SSL]	8070 L [PAL] [ORNL] [MDRES] [SSL]
0.064 UL	0.12 UL	**0.66 L [PAL] [SSL]**	**0.37 L [PAL] [SSL]**	**2.3 L [PAL] [SSL]**
3.1 L [PAL] [ORNL] [MDRES] [MDSGW]	2.9 L [PAL] [ORNL] [MDRES] [MDSGW]	4.8 L [PAL] [ORNL] [MDRES] [MDSGW]	2.8 L [PAL] [ORNL] [MDRES] [MDSGW]	5.1 L [PAL] [ORNL] [MDRES] [MDSGW]
54.4	60.6	50.3	48.6	114 [BKG]
0.69	0.74	0.49	0.55	0.6
0.082 U	0.17 U	0.08 U	0.08 U	0.78 [PAL] [SSL]
2270 [BKG]	2140 [BKG]	587	586	989
35.0 [BKG] [PAL] [MDRES] [SSL]	**38.2 [BKG] [PAL] [MDRES] [SSL]**	18.4	24.2 [PAL] [MDRES]	18.5
6.9 [PAL] [ORNL]	6.6 [PAL] [ORNL]	3.6 [PAL] [ORNL]	3.3 [PAL] [ORNL]	4.7 [PAL] [ORNL]
9.6 J	10.6 J	23.7 J [BKG]	15.6 J	**50.0 J [BKG] [PAL] [SSL]**
17200 [PAL] [ORNL] [MDRES] [SSL]	20600 [PAL] [ORNL] [MDRES] [SSL]	10800 [PAL] [ORNL] [MDRES] [SSL]	13600 [PAL] [ORNL] [MDRES] [SSL]	16900 [PAL] [ORNL] [MDRES] [SSL]
14.7 [PAL] [SSL]	13.8 [PAL] [SSL]	59.2 [PAL] [SSL]	33.2 [PAL] [SSL]	**112 [BKG] [PAL] [SSL]**
12.0 [PAL] [OPLNT]	14.5 [PAL] [OPLNT]	7.7 [PAL] [OPLNT]	9.6 [PAL] [OPLNT]	6.5 [PAL] [OPLNT]
3400 [BKG]	3470 [BKG]	1080	1380	857
179 [PAL] [MDRES]	143	169 [PAL] [MDRES]	119	673 [PAL] [ORNL] [MDRES] [SSL]
0.03 J	0.026 U	0.022	0.017 J	0.08 [PAL] [BTAG]
27.4 [BKG]	26.7 [BKG]	6.9	9.8	11.6
1680 [BKG]	2090 [BKG]	1480 [BKG]	1960 [BKG]	746
0.064 UL	0.12 UL	0.031 UL	0.033 UL	0.21 L
0.082 UL	0.17 UL	0.08 UL	0.08 UL	1.8 L [BKG]
78.3	91.1	26.4	38.1	40.8
9.2	10.0	12.8	13.3	11.8
0.82 U	1.7 U	0.8 U	0.8 U	2.4 J [PAL] [BTAG]
34.2 J [PAL] [MDRES] [SSL]	39.7 J [PAL] [ORNL] [MDRES] [SSL]	22.7 J [PAL] [MDRES] [SSL]	29.3 J [PAL] [MDRES] [SSL]	18.3 J [PAL] [MDRES] [SSL]
42.2 [BKG]	45.2 [BKG]	43.2 [BKG]	34.2	**464 [BKG] [PAL] [SSL]**

APPENDIX L
TABLE 13-4

RES EXCEEDANCES
EOD DEMOLITION SCHOOL (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

a22	a23	a24	a25	a26
022	023	024	025	026
X28SS0100024	X28SS0110006	X28SS0110024	X28SS0120006	X28SS0120024
X28SB010	X28SB011	X28SB011	X28SB012	X28SB012
00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
X28SS0100024	X28SS0110006	X28SS0110024	X28SS0120006	X28SS0120024
20100121	20100121	20100121	20100121	20100121
20100121	20100121	20100121	20100121	20100121
NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SO	SO	SO	SO	SO
0	0	0	0	0
2	0.5	2	0.5	2
SS	SS	SS	SS	SS
c_022	c_023	c_024	c_025	c_026
0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.24 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.24 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1.2 UJ	1.2 U	0.58 J	1.2 U	1.2 U
1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 UR	0.2 U	0.2 U	0.2 U	0.2 U
11000 L [PAL] [ORNL] [MDRES] [SSL]	8320 [PAL] [ORNL] [MDRES] [SSL]	11000 [PAL] [ORNL] [MDRES] [SSL]	12400 [PAL] [ORNL] [MDRES] [SSL]	12200 [PAL] [ORNL] [MDRES] [SSL]
1.9 L [PAL] [SSL]	0.044 J	0.033 UL	0.076 J	0.066 U
3.4 L [PAL] [ORNL] [MDRES] [MDSGW]	1.3 [PAL] [ORNL] [MDRES] [MDSGW]	1.2 [PAL] [ORNL] [MDRES] [MDSGW]	2.6 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]
111 [BKG]	51.5 K	63.8 K	59.3 K	48.1 K
0.79	0.56	0.59	0.66	0.57
0.3 K	0.08 U	0.081 U	0.081 U	0.08 U
767	260 K	245 K	572 K	681 K
18.9	13.6 K	13.3 K	20.7 K	22.2 K
5.2 [PAL] [ORNL]	3.7 [PAL] [ORNL]	3.7 [PAL] [ORNL]	5.2 [PAL] [ORNL]	3.7 [PAL] [ORNL]
30.5 J [BKG] [PAL] [SSL]	9.9 J	5.2 J	12.3 J	8.2 J
14100 [PAL] [ORNL] [MDRES] [SSL]	8000 [PAL] [ORNL] [MDRES] [SSL]	8120 [PAL] [ORNL] [MDRES] [SSL]	13500 [PAL] [ORNL] [MDRES] [SSL]	13900 [PAL] [ORNL] [MDRES] [SSL]
44.2 [PAL] [SSL]	17.6 [PAL] [SSL]	8.7	27.2 [PAL] [SSL]	13.5 [PAL] [SSL]
9.5 [PAL] [OPLNT]	6.2 [PAL] [OPLNT]	7.3 [PAL] [OPLNT]	9.7 [PAL] [OPLNT]	8.9 [PAL] [OPLNT]
1170	878	924	1470	1410
528 [PAL] [ORNL] [MDRES] [SSL]	281 [PAL] [ORNL] [MDRES] [SSL]	253 [PAL] [ORNL] [MDRES] [SSL]	274 [PAL] [ORNL] [MDRES] [SSL]	158
0.042 J	0.042	0.021 J	0.034 J	0.024 J
12.9	6.5	6.8	10.6	9.8
1000	811	718	1530 [BKG]	1630 [BKG]
0.038 J	0.032 U	0.066 U	0.066 U	0.066 U
0.53 L	0.4 L	0.081 UL	0.33 L	0.14 J
44.7	18.9 J	19.8 J	29.1	29.4
11.3	4.6 K	4.8 K	7.0 K	6.0 K
5.1 [PAL] [BTAG]	0.8 U	0.81 U	1.9 J [PAL] [BTAG]	0.8 U
24.3 J [PAL] [MDRES] [SSL]	19.3 K [PAL] [MDRES] [SSL]	18.6 K [PAL] [MDRES] [SSL]	27.4 K [PAL] [MDRES] [SSL]	26.7 K [PAL] [MDRES] [SSL]
483 [BKG] [PAL] [SSL]	23.9 K	22.3 K	36.2 K	28.9 K

APPENDIX L
TABLE 13-4

RES EXCEEDANCES
EOD DEMOLITION SCHOOL (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

a27	a28	a29	a30	a31
027	028	029	030	031
X28SS0130006	X28SS0130024	X28SS0140006	X28SS0140024	X28SS0150006
X28SB013	X28SB013	X28SB014	X28SB014	X28SB015
00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
X28SS0130006	X28SS0130024	X28SS0140006	X28SS0140024	X28SS0150006
20100121	20100121	20100120	20100120	20100120
20100121	20100121	20100121	20100121	20100121
NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SO	SO	SO	SO	SO
0	0	0	0	0
0.5	2	0.5	2	0.5
SS	SS	SS	SS	SS
c_027	c_028	c_029	c_030	c_031
0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 UJ
0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 UJ
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1.2 U	1.2 U	1.2 U	1.2 UJ	1.2 UJ
1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 UR	0.2 UR
3820 [SSL]	3670 [SSL]	14200 [PAL] [ORNL] [MDRES] [SSL]	13200 L [PAL] [ORNL] [MDRES] [SSL]	13300 L [PAL] [ORNL] [MDRES] [SSL]
0.036 J	0.033 UL	0.16 L	0.066 J	**0.73 L [PAL] [SSL]**
0.95 [PAL] [ORNL] [MDRES] [MDSGW]	0.74 [PAL] [ORNL] [MDRES] [MDSGW]	4.6 [PAL] [ORNL] [MDRES] [MDSGW]	4.0 L [PAL] [ORNL] [MDRES] [MDSGW]	8.0 L [PAL] [ORNL] [MDRES] [MDSGW]
49.7 K	46.2 K	48.7 K	40.7	71.0
0.53	0.43 J	0.57	0.61	0.59
0.082 J	0.08 U	0.1 J	0.082 U	0.2 J
848 K	1040 K	460 K	333	444
15.7 K	13.9 K	23.8 K [PAL] [MDRES]	27.4 [PAL] [MDRES] [SSL]	23.3 [PAL] [MDRES]
3.8 [PAL] [ORNL]	4.3 [PAL] [ORNL]	4.1 [PAL] [ORNL]	3.2 [PAL] [ORNL]	4.2 [PAL] [ORNL]
44.5 J [BKG] [PAL] [SSL]	21.0 J [BKG]	14.2 J	8.1 J	**37.4 J [BKG] [PAL] [SSL]**
8930 [PAL] [ORNL] [MDRES] [SSL]	8060 [PAL] [ORNL] [MDRES] [SSL]	13900 [PAL] [ORNL] [MDRES] [SSL]	15000 [PAL] [ORNL] [MDRES] [SSL]	12600 [PAL] [ORNL] [MDRES] [SSL]
20.5 [PAL] [SSL]	15.7 [PAL] [SSL]	19.9 [PAL] [SSL]	11.3 [PAL] [SSL]	**78.3 [BKG] [PAL] [SSL]**
6.0 [PAL] [OPLNT]	5.5 [PAL] [OPLNT]	9.4 [PAL] [OPLNT]	9.1 [PAL] [OPLNT]	9.4 [PAL] [OPLNT]
943	897	1470	1700 [BKG]	1280
279 [PAL] [ORNL] [MDRES] [SSL]	211 [PAL] [ORNL] [MDRES]	215 [PAL] [ORNL] [MDRES]	143	187 [PAL] [ORNL] [MDRES]
0.021 J	0.014 U	0.075 [PAL] [BTAG]	0.038 J	0.037
6.9	6.7	9.0	10.5	8.0
1040	879	1880 [BKG]	2590 [BKG]	1890 [BKG]
0.033 U	0.033 U	0.065 UL	0.033 UL	0.054 J
0.08 UL	0.08 UL	0.08 UL	0.082 UL	0.13 J
22.0 J	18.7 J	25.5	26.1	30.5
5.9 K	5.4 K	9.3 K	9.5	22.4
0.81 J	0.8 U	0.81 U	0.82 U	3.4 [PAL] [BTAG]
20.3 K [PAL] [MDRES] [SSL]	17.2 K [PAL] [MDRES] [SSL]	29.5 K [PAL] [MDRES] [SSL]	28.7 J [PAL] [MDRES] [SSL]	27.7 J [PAL] [MDRES] [SSL]
38.5 K [BKG]	33.8 K	39.6 K [BKG]	31.5	**85.0 [BKG] [PAL] [SSL]**

APPENDIX L
TABLE 13-4

RES EXCEEDANCES
EOD DEMOLITION SCHOOL (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

a32	a33	a34	a35	a36
032	033	034	035	036
X28SS0150024	X28SS0160006	X28SS0160024	X28SS0170006	X28SS0170024
X28SB015	X28SB016	X28SB016	X28SB017	X28SB017
00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
X28SS0150024	X28SS0160006	X28SS0160024	X28SS0170006	X28SS0170024
20100120	20100121	20100121	20100121	20100121
20100121	20100121	20100121	20100121	20100121
NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SO	SO	SO	SO	SO
0	0	0	0	0
2	0.5	2	0.5	2
SS	SS	SS	SS	SS
c_032	c_033	c_034	c_035	c_036
0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 U
1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 UR	0.2 U	0.2 U	0.2 U	0.2 U
11600 L [PAL] [ORNL] [MDRES] [SSL]	8810 [PAL] [ORNL] [MDRES] [SSL]	15000 [PAL] [ORNL] [MDRES] [SSL]	7850 [PAL] [ORNL] [MDRES] [SSL]	9830 [PAL] [ORNL] [MDRES] [SSL]
0.66 L [PAL] [SSL]	0.033 UL	0.033 UL	0.033 UL	0.033 UL
7.9 L [PAL] [ORNL] [MDRES] [MDSGW]	1.4 [PAL] [ORNL] [MDRES] [MDSGW]	2.0 [PAL] [ORNL] [MDRES] [MDSGW]	1.3 [PAL] [ORNL] [MDRES] [MDSGW]	1.7 [PAL] [ORNL] [MDRES] [MDSGW]
99.6 [BKG]	45.0 K	59.9 K	41.4 K	55.6 K
0.68	0.46 J	0.75	0.53	0.71
0.27 K	0.079 U	0.082 U	0.082 U	0.081 U
625	241 K	216 K	250 K	187 K
24.5 [PAL] [MDRES]	13.6 K	23.2 K [PAL] [MDRES]	15.7 K	21.2 K
5.0 [PAL] [ORNL]	5.8 [PAL] [ORNL]	5.7 [PAL] [ORNL]	5.4 [PAL] [ORNL]	5.6 [PAL] [ORNL]
41.2 J [BKG] [PAL] [SSL]	4.8 J	6.8 J	5.3 J	6.4 J
13800 [PAL] [ORNL] [MDRES] [SSL]	8970 [PAL] [ORNL] [MDRES] [SSL]	16200 [PAL] [ORNL] [MDRES] [SSL]	9710 [PAL] [ORNL] [MDRES] [SSL]	13800 [PAL] [ORNL] [MDRES] [SSL]
53.1 [PAL] [SSL]	19.2 [PAL] [SSL]	11.7 [PAL] [SSL]	18.1 [PAL] [SSL]	13.4 [PAL] [SSL]
9.5 [PAL] [OPLNT]	8.4 [PAL] [OPLNT]	14.1 [PAL] [OPLNT]	7.3 [PAL] [OPLNT]	9.8 [PAL] [OPLNT]
1300	805	1300	920	1250
243 [PAL] [ORNL] [MDRES] [SSL]	198 [PAL] [ORNL] [MDRES]	112	185 [PAL] [ORNL] [MDRES]	153
0.026 J	0.033 J	0.02 J	0.03 J	0.02 J
10.3	6.6	8.3	7.3	9.5
1680 [BKG]	832	1310	904	1210
0.067 J	0.033 U	0.066 U	0.033 U	0.033 U
0.092 J	0.079 UL	0.082 UL	0.082 UL	0.081 UL
31.2	31.8	38.1	20.9 J	25.1
40.3	4.9 K	5.7 K	4.4 K	4.6 K
2.1 J [PAL] [BTAG]	0.79 U	0.82 U	0.83 U	0.98 J [PAL] [BTAG]
26.8 J [PAL] [MDRES] [SSL]	21.8 K [PAL] [MDRES] [SSL]	31.3 K [PAL] [MDRES] [SSL]	22.4 K [PAL] [MDRES] [SSL]	28.7 K [PAL] [MDRES] [SSL]
119 [BKG] [PAL] [SSL]	21.9 K	26.6 K	22.3 K	28.7 K

APPENDIX L
TABLE 13-4

RES EXCEEDANCES
EOD DEMOLITION SCHOOL (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

a37	a38	a39	a40	a41
037	038	039	040	041
X28SS0180006	X28SS0180024	X28SS0190006	X28SS0190024	X28SS0200006
X28SB018	X28SB018	X28SB019	X28SB019	X28SB020
00810_20100422	00810_20100422	00810_20100422	00810_20100422	00810_20100422
X28SS0180006	X28SS0180024	X28SS0190006	X28SS0190024	X28SS0200006
20100120	20100120	20100120	20100120	20100121
20100121	20100121	20100121	20100121	20100121
NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
SO	SO	SO	SO	SO
0	0	0	0	0
0.5	2	0.5	2	0.5
SS	SS	SS	SS	SS
c_037	c_038	c_039	c_040	c_041
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
0.2 U	0.2 U	1.3	0.2 U	0.2 U
0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
18200 [PAL] [ORNL] [MDRES] [SSL]	16700 [PAL] [ORNL] [MDRES] [SSL]	12900 [PAL] [ORNL] [MDRES] [SSL]	14900 [PAL] [ORNL] [MDRES] [SSL]	9730 [PAL] [ORNL] [MDRES] [SSL]
0.16 UL	0.11 L	0.099 L	0.16 J	0.14 J
3.3 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]	3.6 [PAL] [ORNL] [MDRES] [MDSGW]	2.5 [PAL] [ORNL] [MDRES] [MDSGW]
77.0 K	57.5 K	62.3 K	50.4 K	41.5 K
0.72	0.7 J	0.61	0.55	0.57
0.082 U	0.15 U	0.095 J	0.079 U	0.1 J
846 K	555 K	813 K	541 K	306 K
22.6 K	27.8 K [PAL] [MDRES] [SSL]	26.2 K [PAL] [MDRES] [SSL]	25.0 K [PAL] [MDRES]	17.7 K
7.3 [PAL] [ORNL]	4.9 [PAL] [ORNL]	4.9 [PAL] [ORNL]	3.3 [PAL] [ORNL]	4.2 [PAL] [ORNL]
9.9 J	9.1 J	13.4 J	9.2 J	16.0 J
16400 [PAL] [ORNL] [MDRES] [SSL]	18500 [PAL] [ORNL] [MDRES] [SSL]	14000 [PAL] [ORNL] [MDRES] [SSL]	14500 [PAL] [ORNL] [MDRES] [SSL]	11300 [PAL] [ORNL] [MDRES] [SSL]
54.0 [PAL] [SSL]	25.9 [PAL] [SSL]	36.5 [PAL] [SSL]	60.6 [PAL] [SSL]	32.7 [PAL] [SSL]
16.5 [PAL] [ORNL] [OPLNT]	13.9 [PAL] [OPLNT]	9.6 [PAL] [OPLNT]	8.8 [PAL] [OPLNT]	7.7 [PAL] [OPLNT]
1400	1620	1490	1490	902
215 [PAL] [ORNL] [MDRES]	136	298 [PAL] [ORNL] [MDRES] [SSL]	124	121
0.85 [BKG] [PAL] [BTAG]	**0.33 [BKG] [PAL] [BTAG]**	0.094 [PAL] [BTAG]	0.065 [PAL] [BTAG]	0.036 J
13.7	9.9	11.5	9.6	6.8
1570 [BKG]	1970 [BKG]	1810 [BKG]	2040 [BKG]	1090
0.066 U	0.066 U	0.065 U	0.065 U	0.075 J
0.082 UL	0.15 UL	0.083 UL	0.079 UL	0.083 UL
53.1	33.4 J	29.0	21.9 J	24.6 J
13.0 K	11.2 K	7.0 K	5.2 K	6.2 K
0.82 U	1.5 U	0.83 U	0.79 U	0.83 U
36.6 K [PAL] [MDRES] [SSL]	36.6 K [PAL] [MDRES] [SSL]	28.0 K [PAL] [MDRES] [SSL]	26.3 K [PAL] [MDRES] [SSL]	23.9 K [PAL] [MDRES] [SSL]
53.4 K [BKG] [PAL] [SSL]	38.5 K [BKG]	**89.3 K [BKG] [PAL] [SSL]**	**91.8 K [BKG] [PAL] [SSL]**	35.5 K
				127
				36.1
				5.8
				12000
				63.9

a42
042
X28SS0200024
X28SB020
00810_20100422
X28SS0200024
20100121
20100121
NORMAL
SO
0
2
SS
c_042

0.2 U
0.2 U
0.24 U
0.2 U
0.2 U
0.2 U
0.2 U
0.24 U
0.2 U
0.2 U
0.2 U
0.2 U
0.2 U
1.2 U
1.2 U
0.2 U
0.2 U

14600 [PAL] [ORNL] [MDRES] [SSL]
0.091 J
3.6 [PAL] [ORNL] [MDRES] [MDSGW]
49.0 K
0.76 J
0.16 U
247 K
29.1 K [PAL] [MDRES] [SSL]
5.3 [PAL] [ORNL]
22.3 J [BKG]
20200 [PAL] [ORNL] [MDRES] [SSL]
21.2 [PAL] [SSL]
11.7 [PAL] [OPLNT]
1460
112
0.036 J
9.7
1920 [BKG]
0.065 U
0.16 UL
38.6 J
6.5
1.6 U
34.4 K [PAL] [MDRES] [SSL]
44.8 K [BKG]

APPENDIX L
TABLE 13-5

SURFACE SOIL FREQUENCY OF DETECTION
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND
Page 1 of 2

cas	parameter	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	frequency	min_ndc	max_ndc	min_nd	max_nd
Explosives (mg/kg)																		
55-63-0	Nitroglycerin	NA	0.61	0.61	NA	NA	NA	NA	NA	NA	NC	NC	NC	2/40	1.2	12	1.2	12
121-82-4	RDX	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	1/40	0.2	2	0.2	2
Inorganics (mg/kg)																		
7429-90-5	Aluminum	19700	7700	7700	7800	NA	10	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7440-36-0	Antimony	NA	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	22/40	0.032	0.16	0.032	0.16
7440-38-2	Arsenic	14.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7440-39-3	Barium	80.4	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7440-41-7	Beryllium	1.1	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7440-43-9	Cadmium	2.5	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	15/40	0.079	0.17	0.079	0.17
7440-70-2	Calcium	2060	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	40/40	0	0	0	0
7440-47-3	Chromium	33.4	**26**	12000	**12000**	**2000000000**	26	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7440-48-4	Cobalt	22.3	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7440-50-8	Copper	20.3	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7439-89-6	Iron	38500	5500	5500	5500	NA	11	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7439-92-1	Lead	62.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7439-93-2	Lithium	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	40/40	0	0	0	0
7439-95-4	Magnesium	1620	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	40/40	0	0	0	0
7439-96-5	Manganese	1390	160	180	160	950	220	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7439-97-6	Mercury	0.16	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	37/40	0.014	0.028	0.014	0.028
7440-02-0	Nickel	15.4	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7440-09-7	Potassium	1470	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	40/40	0	0	0	0
7782-49-2	Selenium	1.2	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	11/40	0.031	0.12	0.031	0.12
7440-22-4	Silver	0.84	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	11/40	0.079	0.17	0.079	0.17
7440-23-5	Sodium	120	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	40/40	0	0	0	0
7440-24-6	Strontium	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	40/40	0	0	0	0
7440-31-5	Tin	NA	0.89	4700	4700	NA	NA	0.89	NC	NC	NC	NC	NC	10/40	0.79	1.7	0.79	1.7
7440-62-2	Vanadium	53.3	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
7440-66-6	Zinc	37.5	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	40/40	0	0	0	0
Miscellaneous																		
TTNUS014	Cation Exchange Capacity (MEQ/100)			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3/3	0	0	0	0
TTNUS288	Percent Moisture (%)			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3/3	0	0	0	0
TTNUS002	PH (s.u.)	**8.8**		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3/3	0	0	0	0
TTNUS003	Total Organic Carbon (mg/kg)	57200		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3/3	0	0	0	0
TTNUS046	Total Solids (%)	**79.2**		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3/3	0	0	0	0

Associated Samples:

X28SS0010006,NORMAL	X28SS0070006,NORMAL	X28SS0150006,NORMAL
X28SS0010024,NORMAL	X28SS0070024,NORMAL	X28SS0150024,NORMAL
X28SS0020006,NORMAL	X28SS0080006,NORMAL	X28SS0160006,NORMAL
X28SS0020024,NORMAL	X28SS0080024,NORMAL	X28SS0160024,NORMAL
X28SS0030006,NORMAL	X28SS0090006,NORMAL	X28SS0170006,NORMAL
X28SS0030024,NORMAL	X28SS0090024,NORMAL	X28SS0170024,NORMAL
X28SS0040006,NORMAL	X28SS0100006,NORMAL	X28SS0180006,NORMAL
X28SS0040024,NORMAL	X28SS0100024,NORMAL	X28SS0180024,NORMAL
X28SS0050006,DUP	X28SS0110006,NORMAL	X28SS0190006,NORMAL
X28SS0050006-AVG,AVG	X28SS0110024,NORMAL	X28SS0190024,NORMAL
X28SS0050006-D,DUP	X28SS0120006,NORMAL	X28SS0200006,NORMAL
X28SS0050024,NORMAL	X28SS0120024,NORMAL	X28SS0200024,NORMAL
X28SS0060006,NORMAL	X28SS0130006,NORMAL	
X28SS0060024,DUP	X28SS0130024,NORMAL	
X28SS0060024-AVG,AVG	X28SS0140006,NORMAL	
X28SS0060024-D,DUP	X28SS0140024,NORMAL	

APPENDIX L
TABLE 13-5

SURFACE SOIL FREQUENCY OF DETECTION
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

min	max	min_c	max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
0.21	0.58	0.21	0.58	J	J	0.21 - 0.58	1.2 - 12	X28SS0110024	0.395	0.72475
1.3	1.3	1.3	1.3			1.3	0.2 - 2	X28SS0190006	1.3	0.1525
3670	18200	3670	18200			3670 - 18200	0	X28SS0180006	11378.625	11378.625
0.033	2.3	0.033	2.3	J	L	0.033 - 2.3	0.032 - 0.16	X28SS0100006	0.364284	0.2124
0.74	8	0.74	8		L	0.74 - 8	0	X28SS0150006	2.727	2.727
34.5	114	34.5	114			34.5 - 114	0	X28SS0100006	59.08	59.08
0.43	0.84	0.43	0.84	J		0.43 - 0.84	0	X28SS0040024	0.613	0.613
0.082	0.78	0.082	0.78	J		0.082 - 0.78	0.079 - 0.17	X28SS0100006	0.212133	0.107806
187	13700	187	13700	K		187 - 13700	0	X28SS0010006	1362.275	1362.275
13.3	40	13.3	40	K		13.3 - 40	0	X28SS0030006	22.18375	22.18375
3.2	10.3	3.2	10.3			3.2 - 10.3	0	X28SS0010006	5.0025	5.0025
4.8	54.7	4.8	54.7	J	J	4.8 - 54.7	0	X28SS0060024	16.7025	16.7025
7140	20600	7140	20600	J		7140 - 20600	0	X28SS0080024	13120	13120
8.1	198	8.1	198			8.1 - 198	0	X28SS0070006	38.075	38.075
5.2	16.5	5.2	16.5	J		5.2 - 16.5	0	X28SS0180006	9.225	9.225
800	7480	800	7480	J		800 - 7480	0	X28SS0030006	1682.55	1682.55
112	673	112	673			112 - 673	0	X28SS0100006	237.7375	237.7375
0.015	0.85	0.015	0.85	J		0.015 - 0.85	0.014 - 0.028	X28SS0180006	0.064973	0.06095
5.9	34.5	5.9	34.5	J		5.9 - 34.5	0	X28SS0030006	12.07125	12.07125
676	2590	676	2590	J		676 - 2590	0	X28SS0140024	1366.475	1366.475
0.032	0.21	0.032	0.21	J	L	0.032 - 0.21	0.031 - 0.12	X28SS0100006	0.07375	0.038519
0.092	19.5	0.092	19.5	J	J	0.092 - 19.5	0.079 - 0.17	X28SS0050006	1.559409	0.462288
17.1	200	17.1	200	J		17.1 - 200	0	X28SS0010006	40.7375	40.7375
4.1	40.3	4.1	40.3			4.1 - 40.3	0	X28SS0150024	9.59625	9.59625
0.81	5.1	0.81	5.1	J		0.81 - 5.1	0.79 - 1.7	X28SS0100024	2.5245	0.976125
15.9	39.7	15.9	39.7	J	J	15.9 - 39.7	0	X28SS0080024	26.4875	26.4875
21.9	483	21.9	483	K		21.9 - 483	0	X28SS0100024	62.75625	62.75625
48.4	127	48.4	127			48.4 - 127	0	X28SS0200006	74.8	74.8
16.6	36.1	16.6	36.1			16.6 - 36.1	0	X28SS0200006	25.9	25.9
5.52	5.82	5.52	5.82			5.52 - 5.82	0	X28SS0060024	5.713333	5.713333
4670	18100	4670	18100			4670 - 18100	0	X28SS0040006	11590	11590
63.9	83.4	63.9	83.4			63.9 - 83.4	0	X28SS0060024	74.1	74.1

APPENDIX L
TABLE 13-6

SURFACE SOIL (0-0.5 feet) FREQUENCY OF DETECTION
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

cas	parameter	utl95val	minorpal	ornl	mderes	mdesogw	ecossl	r3btag	ornlplant	ornlinv	sunplant	suninv	lanlplant	frequency	min_ndc	max_ndc	min_nd	max_nd	min	max	min_c
Explosives (mg/kg)																					
121-82-4	Rdx	NA	5.5	5.5	NA	NA	NA	NA	NA	NA	9537	98	NC	1/20	0.2	2	0.2	2	1.3	1.3	1.3
Inorganics (mg/kg)																					
7429-90-5	Aluminum	19700	7700	7700	7800	NA	10	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	3820	18200	3820
7440-36-0	**Antimony**	NA	0.27	3.1	3.1	13	0.27	NC	NC	NC	NC	NC	NC	13/20	0.032	0.16	0.032	0.16	0.033	2.3	0.033
7440-38-2	Arsenic	14.9	0.026	0.39	0.43	0.026	18	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	0.94	8	0.94
7440-39-3	Barium	80.4	330	1500	1600	6000	330	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	41.4	114	41.4
7440-41-7	Beryllium	1.1	16	16	16	1200	21	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	0.46	0.81	0.46
7440-43-9	Cadmium	2.5	0.36	7	3.9	27	0.36	NC	NC	NC	NC	NC	NC	10/20	0.079	0.083	0.079	0.083	0.082	0.78	0.082
7440-70-2	Calcium	2060	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	20/20	0	0	0	0	241	13700	241
7440-47-3	**Chromium**	33.4	**26**	12000	**12000**	**2000000000**	26	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	13.6	40	13.6
7440-48-4	Cobalt	22.3	2.3	2.3	NA	NA	13	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	3.2	10.3	3.2
7440-50-8	**Copper**	20.3	28	310	310	11000	28	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	4.8	50	4.8
7439-89-6	Iron	38500	5500	5500	5500	NA	11	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	7140	19400	7140
7439-92-1	**Lead**	62.5	11	400	400	NA	11	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	12.1	198	12.1
7439-93-2	Lithium	NA	2	16	NA	NA	NA	NA	2	NA	NC	NC	NC	20/20	0	0	0	0	5.2	16.5	5.2
7439-95-4	**Magnesium**	1620	4400	NA	NA	NA	NA	4400	NC	NC	NC	NC	NC	20/20	0	0	0	0	800	7480	800
7439-96-5	Manganese	1390	160	180	160	950	220	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	121	673	121
7439-97-6	**Mercury**	0.16	0.058	2.3	2.3	NA	NA	0.058	NC	NC	NC	NC	NC	19/20	0.028	0.028	0.028	0.028	0.015	0.85	0.015
7440-02-0	Nickel	15.4	38	150	160	NA	38	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	5.9	34.5	5.9
7440-09-7	Potassium	1470	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	20/20	0	0	0	0	676	1940	676
7782-49-2	Selenium	1.2	0.52	39	39	19	0.52	NC	NC	NC	NC	NC	NC	6/20	0.031	0.066	0.031	0.066	0.054	0.21	0.054
7440-22-4	**Silver**	0.84	4.2	39	39	31	4.2	NC	NC	NC	NC	NC	NC	6/20	0.079	0.17	0.079	0.17	0.093	19.5	0.093
7440-23-5	Sodium	120	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	20/20	0	0	0	0	17.1	200	17.1
7440-24-6	Strontium	NA	120	4700	NA	NA	NA	120	NC	NC	NC	NC	NC	20/20	0	0	0	0	4.1	32	4.1
7440-31-5	Tin	NA	0.89	4700	4700	NA	NA	0.89	NC	NC	NC	NC	NC	6/20	0.79	1.7	0.79	1.7	0.81	3.4	0.81
7440-62-2	Vanadium	53.3	7.8	39	7.8	730	7.8	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	15.9	36.6	15.9
7440-66-6	**Zinc**	37.5	46	2300	2300	14000	46	NC	NC	NC	NC	NC	NC	20/20	0	0	0	0	21.9	464	21.9
Miscellaneous																					
TTNUS014	Cation Exchange Capacity			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	49	127	49
TTNUS288	Percent Moisture			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	25	36.1	25
TTNUS002	Ph	**8.8**		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	5.52	5.8	5.52
TTNUS003	Total Organic Carbon	57200		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	12000	18100	12000
TTNUS046	Total Solids	**79.2**		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2/2	0	0	0	0	63.9	75	63.9

Associated Samples:

X28SS0010006,NORMAL	X28SS0060006,NORMAL	X28SS0130006,NORMAL	X28SS0200006,NORMAL
X28SS0020006,NORMAL	X28SS0070006,NORMAL	X28SS0140006,NORMAL	
X28SS0030006,NORMAL	X28SS0080006,NORMAL	X28SS0150006,NORMAL	
X28SS0040006,NORMAL	X28SS0090006,NORMAL	X28SS0160006,NORMAL	
X28SS0050006,DUP	X28SS0100006,NORMAL	X28SS0170006,NORMAL	
X28SS0050006-AVG,AVG	X28SS0110006,NORMAL	X28SS0180006,NORMAL	
X28SS0050006-D,DUP	X28SS0120006,NORMAL	X28SS0190006,NORMAL	

APPENDIX L
TABLE 13-6

SURFACE SOIL (0-0.5 feet) FREQUENCY OF DETECTION
EOD SCHOOL DEMOLITION AREA (UXO-28)
NAVAL SUPPORT FACILITY
INDIANHEAD, MARYLAND

max_c	min_qual	max_qual	range	range_nd	samp_max	avg_pos	avg_all
1.3			1.3	0.2 - 2	X28SS0190006	1.3	0.205
18200			3820 - 18200	0	X28SS0180006	10725.75	10725.75
2.3	J	L	0.033 - 2.3	0.032 - 0.16	X28SS0100006	0.352385	0.239563
8	L	L	0.94 - 8	0	X28SS0150006	2.8145	2.8145
114	K		41.4 - 114	0	X28SS0100006	59	59
0.81	J		0.46 - 0.81	0	X28SS0010006	0.59675	0.59675
0.78	J		0.082 - 0.78	0.079 - 0.083	X28SS0100006	0.2297	0.135138
13700	K		241 - 13700	0	X28SS0010006	1829.6	1829.6
40	K		13.6 - 40	0	X28SS0030006	21.715	21.715
10.3			3.2 - 10.3	0	X28SS0010006	5.2625	5.2625
50	J	J	4.8 - 50	0	X28SS0100006	18.8525	18.8525
19400	J		7140 - 19400	0	X28SS0010006	12500	12500
198	J		12.1 - 198	0	X28SS0070006	47.7925	47.7925
16.5	J		5.2 - 16.5	0	X28SS0180006	8.85	8.85
7480	J		800 - 7480	0	X28SS0030006	1818.55	1818.55
673			121 - 673	0	X28SS0100006	271.95	271.95
0.85	J		0.015 - 0.85	0.028	X28SS0180006	0.0845	0.080975
34.5	J		5.9 - 34.5	0	X28SS0030006	12.6525	12.6525
1940	J		676 - 1940	0	X28SS0030006	1283.55	1283.55
0.21	J	L	0.054 - 0.21	0.031 - 0.066	X28SS0100006	0.091542	0.044563
19.5	J	J	0.093 - 19.5	0.079 - 0.17	X28SS0050006	2.376083	0.7435
200	J		17.1 - 200	0	X28SS0010006	43.79	43.79
32			4.1 - 32	0	X28SS0010006	10.0125	10.0125
3.4	J		0.81 - 3.4	0.79 - 1.7	X28SS0150006	2.210833	0.971
36.6	J	K	15.9 - 36.6	0	X28SS0180006	25.885	25.885
464	K		21.9 - 464	0	X28SS0100006	63.4075	63.4075
127			49 - 127	0	X28SS0200006	88	88
36.1			25 - 36.1	0	X28SS0200006	30.55	30.55
5.8			5.52 - 5.8	0	X28SS0200006	5.66	5.66
18100			12000 - 18100	0	X28SS0040006	15050	15050
75			63.9 - 75	0	X28SS0040006	69.45	69.45

APPENDIX L

CHEMICAL CONCENTRATIONS IN SURFACE SOIL AND TISSUE
UXO 2
NSF INDIAN HEAD, INDIAN HEAD, MARYLAND

Chemical	Surface Soil Concentrations (mg/kg)				Surface Water Concentrations (mg/L)		Earthworm Bioaccumulation Factors		Earthworm Concentrations (mg/kg)		Plant Bioaccumulation Factors		Plant Concentrations (mg/kg)	
	Maximum Detection	Average All	Average of Positive Detections	Average [1]	Maximum Detection	Average Concentration[1]	Conservative	Average	Maximum Detection	Average	Conservative	Average	Maximum Detection	Average
Inorganics														
COPPER	6.55E+01	9.10E+00	9.10E+00	9.10E+00	0.00E+00	0.00E+00	5.15E-01	5.15E-01	3.37E+01	4.69E+00	Regression from Eco SSL		1.01E+01	4.66E+00
LEAD	7.21E+01	1.77E+01	1.77E+01	1.77E+01	0.00E+00	0.00E+00	Regression equation from Eco SSL		2.54E+01	8.18E+00	Regression from Eco SSL		2.92E+00	1.33E+00
MERCURY	3.20E-01	4.41E-02	4.41E-02	4.41E-02	0.00E+00	0.00E+00	Regression - Sample et al., (1998)		7.37E-01	3.78E-01	1.00E+00	1.00E+00	3.20E-01	4.41E-02
TIN	1.30E+00	4.97E-01	9.85E-01	4.97E-01	0.00E+00	0.00E+00	1.00E+00	1.00E+00	1.30E+00	4.97E-01	4.00E-03	4.00E-03	5.20E-03	1.99E-03
VANADIUM	3.43E+01	1.77E+01	1.77E+01	1.77E+01	0.00E+00	0.00E+00	4.20E-02	4.20E-02	1.44E+00	7.42E-01	4.85E-02	4.85E-02	1.66E-01	8.57E-02
ZINC	5.27E+01	1.90E+01	1.90E+01	1.90E+01	0.00E+00	0.00E+00	Regression equation from Eco SSL		3.14E+02	2.25E+02	Regression from Eco SSL		4.34E+01	2.47E+01

1 - If the average of all value is the greater than the maximum detection, the average of the positive detections was used as the average value.

APPENDIX L

BOBWHITE QUAIL - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 2, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	9.10E+00	0.00E+00	4.66E+00	4.32E-02	0.00E+00	3.62E-01	4.05E-01	4.05E+00	3.49E+01	1.0E-01	1.2E-02
LEAD	1.77E+01	0.00E+00	1.33E+00	8.41E-02	0.00E+00	1.03E-01	1.87E-01	1.63E+00	4.46E+01	1.1E-01	4.2E-03
MERCURY	4.41E-02	0.00E+00	4.41E-02	2.09E-04	0.00E+00	3.42E-03	3.63E-03	6.40E-03	6.40E-02	5.7E-01	5.7E-02
TIN	4.97E-01	0.00E+00	1.99E-03	2.36E-03	0.00E+00	1.55E-04	2.51E-03	6.76E+00	1.69E+01	3.7E-04	1.5E-04
VANADIUM	1.77E+01	0.00E+00	8.57E-02	8.38E-02	0.00E+00	6.66E-03	9.05E-02	3.44E-01	1.69E+00	2.6E-01	5.4E-02
ZINC	1.90E+01	0.00E+00	2.47E+01	9.01E-02	0.00E+00	1.92E+00	2.01E+00	6.61E+01	1.71E+02	3.0E-02	1.2E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.75E-01	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.36E-02	kg/day	Dose (vegetation) = (Cv * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	1.93E-02	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	8.30E-04	kg/day	Cv = Contaminant concentration in vegetation	SW = Surface Water
Home Range = (HR)	1.88E+01	acres	Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

BOBWHITE QUAIL - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 2, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	6.55E+01	0.00E+00	1.01E+01	9.63E-01	0.00E+00	1.07E+00	2.03E+00	4.05E+00	3.49E+01	5.0E-01	5.8E-02
LEAD	7.21E+01	0.00E+00	2.92E+00	1.06E+00	0.00E+00	3.09E-01	1.37E+00	1.63E+00	4.46E+01	8.4E-01	3.1E-02
MERCURY	3.20E-01	0.00E+00	3.20E-01	4.70E-03	0.00E+00	3.38E-02	3.85E-02	6.40E-03	6.40E-02	6.0E+00	6.0E-01
TIN	1.30E+00	0.00E+00	5.20E-03	1.91E-02	0.00E+00	5.50E-04	1.97E-02	6.76E+00	1.69E+01	2.9E-03	1.2E-03
VANADIUM	3.43E+01	0.00E+00	1.66E-01	5.04E-01	0.00E+00	1.76E-02	5.22E-01	3.44E-01	1.69E+00	1.5E+00	3.1E-01
ZINC	5.27E+01	0.00E+00	4.34E+01	7.75E-01	0.00E+00	4.59E+00	5.37E+00	6.61E+01	1.71E+02	8.1E-02	3.1E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.54E-01	kg
Food Ingestion Rate = (If)	1.63E-02	kg/day
Water Ingestion Rate = (Iw)	2.28E-02	L/day
Soil Ingestion Rate = (Is)	2.26E-03	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

AMERICAN ROBIN - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 2, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	9.10E+00	0.00E+00	4.69E+00	8.61E-02	0.00E+00	6.93E-01	7.79E-01	4.05E+00	3.49E+01	1.9E-01	2.2E-02
LEAD	1.77E+01	0.00E+00	8.18E+00	1.68E-01	0.00E+00	1.21E+00	1.38E+00	1.63E+00	4.46E+01	8.4E-01	3.1E-02
MERCURY	4.41E-02	0.00E+00	3.78E-01	4.16E-04	0.00E+00	5.58E-02	5.62E-02	6.40E-03	6.40E-02	8.8E+00	8.8E-01
TIN	4.97E-01	0.00E+00	4.97E-01	4.70E-03	0.00E+00	7.34E-02	7.81E-02	6.76E+00	1.69E+01	1.2E-02	4.6E-03
VANADIUM	1.77E+01	0.00E+00	7.42E-01	1.67E-01	0.00E+00	1.10E-01	2.77E-01	3.44E-01	1.69E+00	8.0E-01	1.6E-01
ZINC	1.90E+01	0.00E+00	2.25E+02	1.80E-01	0.00E+00	3.32E+01	3.34E+01	6.61E+01	1.71E+02	5.0E-01	1.9E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	8.04E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.19E-02	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	1.13E-02	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	7.60E-04	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	6.10E-01	acres	Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

AMERICAN ROBIN - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 2, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	6.55E+01	0.00E+00	3.37E+01	1.73E+00	0.00E+00	5.44E+00	7.18E+00	4.05E+00	3.49E+01	1.8E+00	2.1E-01
LEAD	7.21E+01	0.00E+00	2.54E+01	1.91E+00	0.00E+00	4.10E+00	6.01E+00	1.63E+00	4.46E+01	3.7E+00	1.3E-01
MERCURY	3.20E-01	0.00E+00	7.37E-01	8.47E-03	0.00E+00	1.19E-01	1.27E-01	6.40E-03	6.40E-02	2.0E+01	2.0E+00
TIN	1.30E+00	0.00E+00	1.30E+00	3.44E-02	0.00E+00	2.10E-01	2.44E-01	6.76E+00	1.69E+01	3.6E-02	1.4E-02
VANADIUM	3.43E+01	0.00E+00	1.44E+00	9.08E-01	0.00E+00	2.32E-01	1.14E+00	3.44E-01	1.69E+00	3.3E+00	6.8E-01
ZINC	5.27E+01	0.00E+00	3.14E+02	1.39E+00	0.00E+00	5.07E+01	5.21E+01	6.61E+01	1.71E+02	7.9E-01	3.0E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	7.73E-02	kg
Food Ingestion Rate = (If)	1.25E-02	kg/day
Water Ingestion Rate = (Iw)	1.21E-02	L/day
Soil Ingestion Rate = (Is)	2.05E-03	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (invertebrate) = (Ci * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Ci = Contaminant concentration in invertebrate
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

SHORT-TAILED SHREW - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 2, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	9.10E+00	0.00E+00	4.69E+00	7.29E-03	0.00E+00	4.17E-01	4.24E-01	5.60E+00	8.27E+01	7.6E-02	5.1E-03
LEAD	1.77E+01	0.00E+00	8.18E+00	1.42E-02	0.00E+00	7.28E-01	7.42E-01	4.70E+00	1.86E+02	1.6E-01	4.0E-03
MERCURY	4.41E-02	0.00E+00	3.78E-01	3.53E-05	0.00E+00	3.36E-02	3.36E-02	3.20E-02	1.60E-01	1.1E+00	2.1E-01
TIN	4.97E-01	0.00E+00	4.97E-01	3.98E-04	0.00E+00	4.42E-02	4.46E-02	2.34E+01	3.50E+01	1.9E-03	1.3E-03
VANADIUM	1.77E+01	0.00E+00	7.42E-01	1.42E-02	0.00E+00	6.60E-02	8.02E-02	4.16E+00	9.44E+00	1.9E-02	8.5E-03
ZINC	1.90E+01	0.00E+00	2.25E+02	1.52E-02	0.00E+00	2.00E+01	2.00E+01	7.54E+01	2.98E+02	2.7E-01	6.7E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.61E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.43E-03	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	3.60E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	1.29E-05	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	9.70E-01	acres	Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

SHORT-TAILED SHREW - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 2, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	6.55E+01	0.00E+00	3.37E+01	2.10E-01	0.00E+00	3.60E+00	3.81E+00	5.60E+00	8.27E+01	6.8E-01	4.6E-02
LEAD	7.21E+01	0.00E+00	2.54E+01	2.31E-01	0.00E+00	2.71E+00	2.94E+00	4.70E+00	1.86E+02	6.3E-01	1.6E-02
MERCURY	3.20E-01	0.00E+00	7.37E-01	1.02E-03	0.00E+00	7.86E-02	7.96E-02	3.20E-02	1.60E-01	2.5E+00	5.0E-01
TIN	1.30E+00	0.00E+00	1.30E+00	4.16E-03	0.00E+00	1.39E-01	1.43E-01	2.34E+01	3.50E+01	6.1E-03	4.1E-03
VANADIUM	3.43E+01	0.00E+00	1.44E+00	1.10E-01	0.00E+00	1.54E-01	2.63E-01	4.16E+00	9.44E+00	6.3E-02	2.8E-02
ZINC	5.27E+01	0.00E+00	3.14E+02	1.69E-01	0.00E+00	3.35E+01	3.37E+01	7.54E+01	2.98E+02	4.5E-01	1.1E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.50E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.60E-03	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	4.28E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	4.80E-05	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	Assume 100% on site		Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

MEADOW VOLE - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 2, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	9.10E+00	0.00E+00	4.66E+00	5.32E-03	0.00E+00	2.27E-01	2.32E-01	5.60E+00	8.27E+01	4.1E-02	2.8E-03
LEAD	1.77E+01	0.00E+00	1.33E+00	1.04E-02	0.00E+00	6.48E-02	7.51E-02	4.70E+00	1.86E+02	1.6E-02	4.0E-04
MERCURY	4.41E-02	0.00E+00	4.41E-02	2.58E-05	0.00E+00	2.15E-03	2.17E-03	3.20E-02	1.60E-01	6.8E-02	1.4E-02
TIN	4.97E-01	0.00E+00	1.99E-03	2.90E-04	0.00E+00	9.68E-05	3.87E-04	2.34E+01	3.50E+01	1.7E-05	1.1E-05
VANADIUM	1.77E+01	0.00E+00	8.57E-02	1.03E-02	0.00E+00	4.18E-03	1.45E-02	4.16E+00	9.44E+00	3.5E-03	1.5E-03
ZINC	1.90E+01	0.00E+00	2.47E+01	1.11E-02	0.00E+00	1.20E+00	1.21E+00	7.54E+01	2.98E+02	1.6E-02	4.1E-03

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	3.58E-02	kg
Food Ingestion Rate = (If)	1.74E-03	kg/day
Water Ingestion Rate = (Iw)	6.26E-03	L/day
Soil Ingestion Rate = (Is)	2.09E-05	kg/day
Home Range = (HR)	6.59E-02	acres
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

MEADOW VOLE - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 2, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	6.55E+01	0.00E+00	1.01E+01	2.32E-01	0.00E+00	1.12E+00	1.35E+00	5.60E+00	8.27E+01	2.4E-01	1.6E-02
LEAD	7.21E+01	0.00E+00	2.92E+00	2.55E-01	0.00E+00	3.23E-01	5.78E-01	4.70E+00	1.86E+02	1.2E-01	3.1E-03
MERCURY	3.20E-01	0.00E+00	3.20E-01	1.13E-03	0.00E+00	3.54E-02	3.65E-02	3.20E-02	1.60E-01	1.1E+00	2.3E-01
TIN	1.30E+00	0.00E+00	5.20E-03	4.60E-03	0.00E+00	5.75E-04	5.17E-03	2.34E+01	3.50E+01	2.2E-04	1.5E-04
VANADIUM	3.43E+01	0.00E+00	1.66E-01	1.21E-01	0.00E+00	1.84E-02	1.40E-01	4.16E+00	9.44E+00	3.4E-02	1.5E-02
ZINC	5.27E+01	0.00E+00	4.34E+01	1.86E-01	0.00E+00	4.80E+00	4.99E+00	7.54E+01	2.98E+02	6.6E-02	1.7E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.70E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.88E-03	kg/day	Dose (vegetation) = (Cv * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	7.51E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	6.01E-05	kg/day	Cv = Contaminant concentration in vegetation	SW = Surface Water
Home Range = (HR)	Assume 100% on site		Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

BOBWHITE QUAIL - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 4, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	2.01E+01	0.00E+00	6.36E+00	9.54E-02	0.00E+00	4.95E-01	5.90E-01	4.05E+00	3.49E+01	1.5E-01	1.7E-02
LEAD	3.92E+01	0.00E+00	2.07E+00	1.86E-01	0.00E+00	1.61E-01	3.47E-01	1.63E+00	4.46E+01	2.1E-01	7.8E-03
MERCURY	8.39E-02	0.00E+00	8.39E-02	3.98E-04	0.00E+00	6.52E-03	6.92E-03	6.40E-03	6.40E-02	1.1E+00	1.1E-01
ZINC	5.32E+01	0.00E+00	4.37E+01	2.52E-01	0.00E+00	3.39E+00	3.65E+00	6.61E+01	1.71E+02	5.5E-02	2.1E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.75E-01	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.36E-02	kg/day	Dose (vegetation) = (Cv * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	1.93E-02	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	8.30E-04	kg/day	Cv = Contaminant concentration in vegetation	SW = Surface Water
Home Range = (HR)	1.88E+01	acres	Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

BOBWHITE QUAIL - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 4, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	8.90E+01	0.00E+00	1.14E+01	1.31E+00	0.00E+00	1.21E+00	2.52E+00	4.05E+00	3.49E+01	6.2E-01	7.2E-02
LEAD	1.19E+02	0.00E+00	3.87E+00	1.75E+00	0.00E+00	4.09E-01	2.16E+00	1.63E+00	4.46E+01	1.3E+00	4.8E-02
MERCURY	5.70E-01	0.00E+00	5.70E-01	8.38E-03	0.00E+00	6.03E-02	6.86E-02	6.40E-03	6.40E-02	1.1E+01	1.1E+00
ZINC	2.39E+02	0.00E+00	1.00E+02	3.51E+00	0.00E+00	1.06E+01	1.41E+01	6.61E+01	1.71E+02	2.1E-01	8.2E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.54E-01	kg
Food Ingestion Rate = (If)	1.63E-02	kg/day
Water Ingestion Rate = (Iw)	2.28E-02	L/day
Soil Ingestion Rate = (Is)	2.26E-03	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

AMERICAN ROBIN - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 4, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	2.01E+01	0.00E+00	1.04E+01	1.90E-01	0.00E+00	1.53E+00	1.72E+00	4.05E+00	3.49E+01	4.2E-01	4.9E-02
LEAD	3.92E+01	0.00E+00	1.55E+01	3.70E-01	0.00E+00	2.29E+00	2.66E+00	1.63E+00	4.46E+01	1.6E+00	6.0E-02
MERCURY	8.39E-02	0.00E+00	4.69E-01	7.93E-04	0.00E+00	6.93E-02	7.01E-02	6.40E-03	6.40E-02	1.1E+01	1.1E+00
ZINC	5.32E+01	0.00E+00	3.15E+02	5.03E-01	0.00E+00	4.65E+01	4.70E+01	6.61E+01	1.71E+02	7.1E-01	2.7E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	8.04E-02	kg
Food Ingestion Rate = (If)	1.19E-02	kg/day
Water Ingestion Rate = (Iw)	1.13E-02	L/day
Soil Ingestion Rate = (Is)	7.60E-04	kg/day
Home Range = (HR)	6.10E-01	acres
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (invertebrate) = (Ci * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Ci = Contaminant concentration in invertebrate
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

AMERICAN ROBIN - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 4, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	8.90E+01	0.00E+00	4.58E+01	2.36E+00	0.00E+00	7.40E+00	9.75E+00	4.05E+00	3.49E+01	2.4E+00	2.8E-01
LEAD	1.19E+02	0.00E+00	3.80E+01	3.15E+00	0.00E+00	6.14E+00	9.29E+00	1.63E+00	4.46E+01	5.7E+00	2.1E-01
MERCURY	5.70E-01	0.00E+00	8.95E-01	1.51E-02	0.00E+00	1.44E-01	1.59E-01	6.40E-03	6.40E-02	2.5E+01	2.5E+00
ZINC	2.39E+02	0.00E+00	5.16E+02	6.33E+00	0.00E+00	8.32E+01	8.95E+01	6.61E+01	1.71E+02	1.4E+00	5.2E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	7.73E-02	kg
Food Ingestion Rate = (If)	1.25E-02	kg/day
Water Ingestion Rate = (Iw)	1.21E-02	L/day
Soil Ingestion Rate = (Is)	2.05E-03	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (invertebrate) = (Ci * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Ci = Contaminant concentration in invertebrate
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

SHORT-TAILED SHREW - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 4, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	2.01E+01	0.00E+00	1.04E+01	1.61E-02	0.00E+00	9.22E-01	9.38E-01	5.60E+00	8.27E+01	1.7E-01	1.1E-02
LEAD	3.92E+01	0.00E+00	1.55E+01	3.14E-02	0.00E+00	1.38E+00	1.41E+00	4.70E+00	1.86E+02	3.0E-01	7.6E-03
MERCURY	8.39E-02	0.00E+00	4.69E-01	6.72E-05	0.00E+00	4.18E-02	4.18E-02	3.20E-02	1.60E-01	1.3E+00	2.6E-01
ZINC	5.32E+01	0.00E+00	3.15E+02	4.26E-02	0.00E+00	2.80E+01	2.81E+01	7.54E+01	2.98E+02	3.7E-01	9.4E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.61E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.43E-03	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	3.60E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	1.29E-05	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	9.70E-01	acres	Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

SHORT-TAILED SHREW - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 4, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	8.90E+01	0.00E+00	4.58E+01	2.85E-01	0.00E+00	4.89E+00	5.17E+00	5.60E+00	8.27E+01	9.2E-01	6.3E-02
LEAD	1.19E+02	0.00E+00	3.80E+01	3.81E-01	0.00E+00	4.06E+00	4.44E+00	4.70E+00	1.86E+02	9.4E-01	2.4E-02
MERCURY	5.70E-01	0.00E+00	8.95E-01	1.82E-03	0.00E+00	9.55E-02	9.73E-02	3.20E-02	1.60E-01	3.0E+00	6.1E-01
ZINC	2.39E+02	0.00E+00	5.16E+02	7.65E-01	0.00E+00	5.50E+01	5.58E+01	7.54E+01	2.98E+02	7.4E-01	1.9E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.50E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.60E-03	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	4.28E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	4.80E-05	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	Assume 100% on site		Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

MEADOW VOLE - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 4, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	2.01E+01	0.00E+00	6.36E+00	1.18E-02	0.00E+00	3.10E-01	3.22E-01	5.60E+00	8.27E+01	5.7E-02	3.9E-03
LEAD	3.92E+01	0.00E+00	2.07E+00	2.29E-02	0.00E+00	1.01E-01	1.24E-01	4.70E+00	1.86E+02	2.6E-02	6.7E-04
MERCURY	8.39E-02	0.00E+00	8.39E-02	4.91E-05	0.00E+00	4.09E-03	4.14E-03	3.20E-02	1.60E-01	1.3E-01	2.6E-02
ZINC	5.32E+01	0.00E+00	4.37E+01	3.11E-02	0.00E+00	2.13E+00	2.16E+00	7.54E+01	2.98E+02	2.9E-02	7.3E-03

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	3.58E-02	kg
Food Ingestion Rate = (If)	1.74E-03	kg/day
Water Ingestion Rate = (Iw)	6.26E-03	L/day
Soil Ingestion Rate = (Is)	2.09E-05	kg/day
Home Range = (HR)	6.59E-02	acres
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

MEADOW VOLE - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 4, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	8.90E+01	0.00E+00	1.14E+01	3.15E-01	0.00E+00	1.26E+00	1.58E+00	5.60E+00	8.27E+01	2.8E-01	1.9E-02
LEAD	1.19E+02	0.00E+00	3.87E+00	4.21E-01	0.00E+00	4.27E-01	8.48E-01	4.70E+00	1.86E+02	1.8E-01	4.6E-03
MERCURY	5.70E-01	0.00E+00	5.70E-01	2.02E-03	0.00E+00	6.30E-02	6.50E-02	3.20E-02	1.60E-01	2.0E+00	4.1E-01
ZINC	2.39E+02	0.00E+00	1.00E+02	8.45E-01	0.00E+00	1.11E+01	1.19E+01	7.54E+01	2.98E+02	1.6E-01	4.0E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.70E-02	kg
Food Ingestion Rate = (If)	1.88E-03	kg/day
Water Ingestion Rate = (Iw)	7.51E-03	L/day
Soil Ingestion Rate = (Is)	6.01E-05	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

BOBWHITE QUAIL - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 5, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	1.64E+01	0.00E+00	5.87E+00	7.76E-02	0.00E+00	4.56E-01	5.34E-01	4.05E+00	3.49E+01	1.3E-01	1.5E-02
LEAD	2.01E+01	0.00E+00	1.43E+00	9.54E-02	0.00E+00	1.11E-01	2.06E-01	1.63E+00	4.46E+01	1.3E-01	4.6E-03
MERCURY	1.47E-01	0.00E+00	1.47E-01	6.95E-04	0.00E+00	1.14E-02	1.21E-02	6.40E-03	6.40E-02	1.9E+00	1.9E-01
ZINC	3.85E+01	0.00E+00	3.65E+01	1.83E-01	0.00E+00	2.84E+00	3.02E+00	6.61E+01	1.71E+02	4.6E-02	1.8E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.75E-01	kg
Food Ingestion Rate = (If)	1.36E-02	kg/day
Water Ingestion Rate = (Iw)	1.93E-02	L/day
Soil Ingestion Rate = (Is)	8.30E-04	kg/day
Home Range = (HR)	1.88E+01	acres
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

BOBWHITE QUAIL - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 5, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	6.01E+01	0.00E+00	9.79E+00	8.83E-01	0.00E+00	1.04E+00	1.92E+00	4.05E+00	3.49E+01	4.7E-01	5.5E-02
LEAD	4.03E+01	0.00E+00	2.11E+00	5.92E-01	0.00E+00	2.23E-01	8.15E-01	1.63E+00	4.46E+01	5.0E-01	1.8E-02
MERCURY	1.20E+00	0.00E+00	1.20E+00	1.76E-02	0.00E+00	1.27E-01	1.45E-01	6.40E-03	6.40E-02	2.3E+01	2.3E+00
ZINC	7.36E+01	0.00E+00	5.23E+01	1.08E+00	0.00E+00	5.53E+00	6.61E+00	6.61E+01	1.71E+02	1.0E-01	3.9E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.54E-01	kg
Food Ingestion Rate = (If)	1.63E-02	kg/day
Water Ingestion Rate = (Iw)	2.28E-02	L/day
Soil Ingestion Rate = (Is)	2.26E-03	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

AMERICAN ROBIN - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 5, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	1.64E+01	0.00E+00	8.43E+00	1.55E-01	0.00E+00	1.25E+00	1.40E+00	4.05E+00	3.49E+01	3.5E-01	4.0E-02
LEAD	2.01E+01	0.00E+00	9.06E+00	1.90E-01	0.00E+00	1.34E+00	1.53E+00	1.63E+00	4.46E+01	9.4E-01	3.4E-02
MERCURY	1.47E-01	0.00E+00	5.66E-01	1.39E-03	0.00E+00	8.36E-02	8.50E-02	6.40E-03	6.40E-02	1.3E+01	1.3E+00
ZINC	3.85E+01	0.00E+00	2.83E+02	3.64E-01	0.00E+00	4.18E+01	4.22E+01	6.61E+01	1.71E+02	6.4E-01	2.5E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	8.04E-02	kg
Food Ingestion Rate = (If)	1.19E-02	kg/day
Water Ingestion Rate = (Iw)	1.13E-02	L/day
Soil Ingestion Rate = (Is)	7.60E-04	kg/day
Home Range = (HR)	6.10E-01	acres
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (invertebrate) = (Ci * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Ci = Contaminant concentration in invertebrate
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

AMERICAN ROBIN - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 5, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	6.01E+01	0.00E+00	3.10E+01	1.59E+00	0.00E+00	4.99E+00	6.59E+00	4.05E+00	3.49E+01	1.6E+00	1.9E-01
LEAD	4.03E+01	0.00E+00	1.59E+01	1.07E+00	0.00E+00	2.56E+00	3.63E+00	1.63E+00	4.46E+01	2.2E+00	8.1E-02
MERCURY	1.20E+00	0.00E+00	1.15E+00	3.18E-02	0.00E+00	1.86E-01	2.17E-01	6.40E-03	6.40E-02	3.4E+01	3.4E+00
ZINC	7.36E+01	0.00E+00	3.50E+02	1.95E+00	0.00E+00	5.65E+01	5.85E+01	6.61E+01	1.71E+02	8.8E-01	3.4E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	7.73E-02	kg
Food Ingestion Rate = (If)	1.25E-02	kg/day
Water Ingestion Rate = (Iw)	1.21E-02	L/day
Soil Ingestion Rate = (Is)	2.05E-03	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (invertebrate) = (Ci * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Ci = Contaminant concentration in invertebrate
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

SHORT-TAILED SHREW - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 5, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	1.64E+01	0.00E+00	8.43E+00	1.31E-02	0.00E+00	7.50E-01	7.63E-01	5.60E+00	8.27E+01	1.4E-01	9.2E-03
LEAD	2.01E+01	0.00E+00	9.06E+00	1.61E-02	0.00E+00	8.06E-01	8.22E-01	4.70E+00	1.86E+02	1.7E-01	4.4E-03
MERCURY	1.47E-01	0.00E+00	5.66E-01	1.17E-04	0.00E+00	5.04E-02	5.05E-02	3.20E-02	1.60E-01	1.6E+00	3.2E-01
ZINC	3.85E+01	0.00E+00	2.83E+02	3.08E-02	0.00E+00	2.52E+01	2.52E+01	7.54E+01	2.98E+02	3.3E-01	8.5E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.61E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.43E-03	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	3.60E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	1.29E-05	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	9.70E-01	acres	Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

SHORT-TAILED SHREW - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 5, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	6.01E+01	0.00E+00	3.10E+01	1.92E-01	0.00E+00	3.30E+00	3.49E+00	5.60E+00	8.27E+01	6.2E-01	4.2E-02
LEAD	4.03E+01	0.00E+00	1.59E+01	1.29E-01	0.00E+00	1.69E+00	1.82E+00	4.70E+00	1.86E+02	3.9E-01	9.8E-03
MERCURY	1.20E+00	0.00E+00	1.15E+00	3.84E-03	0.00E+00	1.23E-01	1.27E-01	3.20E-02	1.60E-01	4.0E+00	7.9E-01
ZINC	7.36E+01	0.00E+00	3.50E+02	2.36E-01	0.00E+00	3.74E+01	3.76E+01	7.54E+01	2.98E+02	5.0E-01	1.3E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.50E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.60E-03	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	4.28E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	4.80E-05	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	Assume 100% on site		Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

MEADOW VOLE - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 5, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	1.64E+01	0.00E+00	5.87E+00	9.57E-03	0.00E+00	2.86E-01	2.95E-01	5.60E+00	8.27E+01	5.3E-02	3.6E-03
MERCURY	1.47E-01	0.00E+00	1.47E-01	8.56E-05	0.00E+00	7.14E-03	7.22E-03	3.20E-02	1.60E-01	2.3E-01	4.5E-02
NICKEL	2.17E+01	0.00E+00	1.08E+00	1.27E-02	0.00E+00	5.27E-02	6.54E-02	1.70E+00	1.48E+01	3.8E-02	4.4E-03
ZINC	3.85E+01	0.00E+00	3.65E+01	2.25E-02	0.00E+00	1.78E+00	1.80E+00	7.54E+01	2.98E+02	2.4E-02	6.1E-03

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	3.58E-02	kg
Food Ingestion Rate = (If)	1.74E-03	kg/day
Water Ingestion Rate = (Iw)	6.26E-03	L/day
Soil Ingestion Rate = (Is)	2.09E-05	kg/day
Home Range = (HR)	6.59E-02	acres
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

MEADOW VOLE - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 5, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
COPPER	6.01E+01	0.00E+00	9.79E+00	2.12E-01	0.00E+00	1.08E+00	1.29E+00	5.60E+00	8.27E+01	2.3E-01	1.6E-02
MERCURY	1.20E+00	0.00E+00	1.20E+00	4.24E-03	0.00E+00	1.33E-01	1.37E-01	3.20E-02	1.60E-01	4.3E+00	8.6E-01
NICKEL	2.30E+02	0.00E+00	6.33E+00	8.13E-01	0.00E+00	6.99E-01	1.51E+00	1.70E+00	1.48E+01	8.9E-01	1.0E-01
ZINC	7.36E+01	0.00E+00	5.23E+01	2.60E-01	0.00E+00	5.78E+00	6.04E+00	7.54E+01	2.98E+02	8.0E-02	2.0E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.70E-02	kg
Food Ingestion Rate = (If)	1.88E-03	kg/day
Water Ingestion Rate = (Iw)	7.51E-03	L/day
Soil Ingestion Rate = (Is)	6.01E-05	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

BOBWHITE QUAIL - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 28, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
CHROMIUM	2.17E+01	0.00E+00	8.90E-01	1.03E-01	0.00E+00	6.92E-02	1.72E-01	2.66E+00	1.56E+01	6.5E-02	1.1E-02
COPPER	1.89E+01	0.00E+00	6.20E+00	8.94E-02	0.00E+00	4.82E-01	5.72E-01	4.05E+00	3.49E+01	1.4E-01	1.6E-02
LEAD	4.78E+01	0.00E+00	2.32E+00	2.27E-01	0.00E+00	1.80E-01	4.07E-01	1.63E+00	4.46E+01	2.5E-01	9.1E-03
MERCURY	8.10E-02	0.00E+00	8.10E-02	3.84E-04	0.00E+00	6.30E-03	6.68E-03	6.40E-03	6.40E-02	1.0E+00	1.0E-01
SILVER	7.44E-01	0.00E+00	1.04E-02	3.53E-03	0.00E+00	8.09E-04	4.34E-03	2.02E+00	6.05E+01	2.1E-03	7.2E-05
ZINC	6.34E+01	0.00E+00	4.81E+01	3.01E-01	0.00E+00	3.74E+00	4.04E+00	6.61E+01	1.71E+02	6.1E-02	2.4E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.75E-01	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.36E-02	kg/day	Dose (vegetation) = (Cv * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	1.93E-02	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	8.30E-04	kg/day	Cv = Contaminant concentration in vegetation	SW = Surface Water
Home Range = (HR)	1.88E+01	acres	Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

BOBWHITE QUAIL - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 28, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
CHROMIUM	4.00E+01	0.00E+00	1.64E+00	5.88E-01	0.00E+00	1.73E-01	7.61E-01	2.66E+00	1.56E+01	2.9E-01	4.9E-02
COPPER	5.00E+01	0.00E+00	9.11E+00	7.35E-01	0.00E+00	9.63E-01	1.70E+00	4.05E+00	3.49E+01	4.2E-01	4.9E-02
LEAD	1.98E+02	0.00E+00	5.15E+00	2.91E+00	0.00E+00	5.44E-01	3.45E+00	1.63E+00	4.46E+01	2.1E+00	7.7E-02
MERCURY	8.50E-01	0.00E+00	8.50E-01	1.25E-02	0.00E+00	8.99E-02	1.02E-01	6.40E-03	6.40E-02	1.6E+01	1.6E+00
SILVER	1.95E+01	0.00E+00	2.73E-01	2.87E-01	0.00E+00	2.89E-02	3.15E-01	2.02E+00	6.05E+01	1.6E-01	5.2E-03
ZINC	4.64E+02	0.00E+00	1.45E+02	6.82E+00	0.00E+00	1.53E+01	2.21E+01	6.61E+01	1.71E+02	3.4E-01	1.3E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.54E-01	kg
Food Ingestion Rate = (If)	1.63E-02	kg/day
Water Ingestion Rate = (Iw)	2.28E-02	L/day
Soil Ingestion Rate = (Is)	2.26E-03	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

AMERICAN ROBIN - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 28, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
CHROMIUM	2.17E+01	0.00E+00	6.64E+00	2.05E-01	0.00E+00	9.82E-01	1.19E+00	2.66E+00	1.56E+01	4.5E-01	7.6E-02
COPPER	1.89E+01	0.00E+00	9.71E+00	1.78E-01	0.00E+00	1.43E+00	1.61E+00	4.05E+00	3.49E+01	4.0E-01	4.6E-02
LEAD	4.78E+01	0.00E+00	1.82E+01	4.52E-01	0.00E+00	2.69E+00	3.14E+00	1.63E+00	4.46E+01	1.9E+00	7.0E-02
MERCURY	8.10E-02	0.00E+00	4.64E-01	7.66E-04	0.00E+00	6.85E-02	6.92E-02	6.40E-03	6.40E-02	1.1E+01	1.1E+00
SILVER	7.44E-01	0.00E+00	1.52E+00	7.03E-03	0.00E+00	2.25E-01	2.32E-01	2.02E+00	6.05E+01	1.1E-01	3.8E-03
ZINC	6.34E+01	0.00E+00	3.34E+02	5.99E-01	0.00E+00	4.93E+01	4.99E+01	6.61E+01	1.71E+02	7.5E-01	2.9E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	8.04E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.19E-02	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	1.13E-02	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	7.60E-04	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	6.10E-01	acres	Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

AMERICAN ROBIN - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 28, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
CHROMIUM	4.00E+01	0.00E+00	1.22E+01	1.06E+00	0.00E+00	1.98E+00	3.03E+00	2.66E+00	1.56E+01	1.1E+00	1.9E-01
COPPER	5.00E+01	0.00E+00	2.58E+01	1.32E+00	0.00E+00	4.16E+00	5.48E+00	4.05E+00	3.49E+01	1.4E+00	1.6E-01
LEAD	1.98E+02	0.00E+00	5.74E+01	5.24E+00	0.00E+00	9.26E+00	1.45E+01	1.63E+00	4.46E+01	8.9E+00	3.2E-01
MERCURY	8.50E-01	0.00E+00	1.02E+00	2.25E-02	0.00E+00	1.65E-01	1.88E-01	6.40E-03	6.40E-02	2.9E+01	2.9E+00
SILVER	1.95E+01	0.00E+00	3.99E+01	5.16E-01	0.00E+00	6.44E+00	6.95E+00	2.02E+00	6.05E+01	3.4E+00	1.1E-01
ZINC	4.64E+02	0.00E+00	6.41E+02	1.23E+01	0.00E+00	1.03E+02	1.16E+02	6.61E+01	1.71E+02	1.8E+00	6.7E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	7.73E-02	kg
Food Ingestion Rate = (If)	1.25E-02	kg/day
Water Ingestion Rate = (Iw)	1.21E-02	L/day
Soil Ingestion Rate = (Is)	2.05E-03	kg/day
Home Range = (HR)	Assume 100% on site	
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (invertebrate) = (Ci * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Ci = Contaminant concentration in invertebrate
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

SHORT-TAILED SHREW - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 28, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
CHROMIUM	2.17E+01	0.00E+00	6.64E+00	1.74E-02	0.00E+00	5.91E-01	6.09E-01	2.40E+00	5.82E+01	2.5E-01	1.0E-02
COPPER	1.89E+01	0.00E+00	9.71E+00	1.51E-02	0.00E+00	8.64E-01	8.79E-01	5.60E+00	8.27E+01	1.6E-01	1.1E-02
LEAD	4.78E+01	0.00E+00	1.82E+01	3.83E-02	0.00E+00	1.62E+00	1.66E+00	4.70E+00	1.86E+02	3.5E-01	8.9E-03
MERCURY	8.10E-02	0.00E+00	4.64E-01	6.48E-05	0.00E+00	4.13E-02	4.13E-02	3.20E-02	1.60E-01	1.3E+00	2.6E-01
SILVER	7.44E-01	0.00E+00	1.52E+00	5.95E-04	0.00E+00	1.35E-01	1.36E-01	6.02E+00	1.19E+02	2.3E-02	1.1E-03
ZINC	6.34E+01	0.00E+00	3.34E+02	5.08E-02	0.00E+00	2.97E+01	2.97E+01	7.54E+01	2.98E+02	3.9E-01	1.0E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.61E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.43E-03	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	3.60E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	1.29E-05	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	9.70E-01	acres	Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

SHORT-TAILED SHREW - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 28, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Invertebrate Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Invert.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
CHROMIUM	4.00E+01	0.00E+00	1.22E+01	1.28E-01	0.00E+00	1.31E+00	1.43E+00	2.40E+00	5.82E+01	6.0E-01	2.5E-02
COPPER	5.00E+01	0.00E+00	2.58E+01	1.60E-01	0.00E+00	2.75E+00	2.91E+00	5.60E+00	8.27E+01	5.2E-01	3.5E-02
LEAD	1.98E+02	0.00E+00	5.74E+01	6.34E-01	0.00E+00	6.12E+00	6.76E+00	4.70E+00	1.86E+02	1.4E+00	3.6E-02
MERCURY	8.50E-01	0.00E+00	1.02E+00	2.72E-03	0.00E+00	1.09E-01	1.12E-01	3.20E-02	1.60E-01	3.5E+00	7.0E-01
SILVER	1.95E+01	0.00E+00	3.99E+01	6.24E-02	0.00E+00	4.25E+00	4.32E+00	6.02E+00	1.19E+02	7.2E-01	3.6E-02
ZINC	4.64E+02	0.00E+00	6.41E+02	1.49E+00	0.00E+00	6.84E+01	6.99E+01	7.54E+01	2.98E+02	9.3E-01	2.3E-01

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.50E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.60E-03	kg/day	Dose (invertebrate) = (Ci * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	4.28E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	4.80E-05	kg/day	Ci = Contaminant concentration in invertebrate	SW = Surface Water
Home Range = (HR)	Assume 100% on site		Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (invertebrate) + Dose (water)	
			H=CA/HR (Assume = to 1)	

APPENDIX L

MEADOW VOLE - AVERAGE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 28, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Avg Soil Conc. (mg/kg)	Avg SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
CHROMIUM	2.17E+01	0.00E+00	8.90E-01	1.27E-02	0.00E+00	4.34E-02	5.61E-02	2.40E+00	5.82E+01	2.3E-02	9.6E-04
COPPER	1.89E+01	0.00E+00	6.20E+00	1.10E-02	0.00E+00	3.02E-01	3.13E-01	5.60E+00	8.27E+01	5.6E-02	3.8E-03
LEAD	4.78E+01	0.00E+00	2.32E+00	2.79E-02	0.00E+00	1.13E-01	1.41E-01	4.70E+00	1.86E+02	3.0E-02	7.6E-04
MERCURY	8.10E-02	0.00E+00	8.10E-02	4.73E-05	0.00E+00	3.94E-03	3.99E-03	3.20E-02	1.60E-01	1.2E-01	2.5E-02
SILVER	7.44E-01	0.00E+00	1.04E-02	4.35E-04	0.00E+00	5.07E-04	9.42E-04	6.02E+00	1.19E+02	1.6E-04	7.9E-06
ZINC	6.34E+01	0.00E+00	4.81E+01	3.71E-02	0.00E+00	2.34E+00	2.38E+00	7.54E+01	2.98E+02	3.2E-02	8.0E-03

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	3.58E-02	kg
Food Ingestion Rate = (If)	1.74E-03	kg/day
Water Ingestion Rate = (Iw)	6.26E-03	L/day
Soil Ingestion Rate = (Is)	2.09E-05	kg/day
Home Range = (HR)	6.59E-02	acres
Contaminated Area = (CA)	Assume equal to home range	

Dose (soil) = (Cs * Is)(H)/BW
Dose (vegetation) = (Cv * If)(H)/BW
Dose (water) = (Cw * Iw)(H)/BW
Cv = Contaminant concentration in vegetation
Cs = Contaminant concentration in soil
Cw = Contaminant concentration in water
Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)
H=CA/HR (Assume = to 1)

Conc = Concentration
LOAEL = Lowest Observed Adverse Effects Concentration
NOAEL = No Observed Adverse Effects Concentration
SW = Surface Water

APPENDIX L

MEADOW VOLE - CONSERVATIVE INPUTS
TERRESTRIAL WILDLIFE MODEL ECOLOGICAL EFFECTS QUOTIENT CALCULATION
UXO 28, NSF INDIAN HEAD
INDIAN HEAD, MARYLAND

Chemical	Max Soil Conc. (mg/kg)	Max SW Conc. (mg/L)	Vegetation Conc. (mg/kg)	Dose (mg/kg/d) from: Soil	Surface Water	Veget.	Total Dose (mg/kg/d)	NOAEL (mg/kg/d)	LOAEL (mg/kg/d)	Hazard Quotients NOAEL	LOAEL
Inorganics											
CHROMIUM	4.00E+01	0.00E+00	1.64E+00	1.41E-01	0.00E+00	1.81E-01	3.23E-01	2.40E+00	5.82E+01	1.3E-01	5.5E-03
COPPER	5.00E+01	0.00E+00	9.11E+00	1.77E-01	0.00E+00	1.01E+00	1.18E+00	5.60E+00	8.27E+01	2.1E-01	1.4E-02
LEAD	1.98E+02	0.00E+00	5.15E+00	7.00E-01	0.00E+00	5.69E-01	1.27E+00	4.70E+00	1.86E+02	2.7E-01	6.8E-03
MERCURY	8.50E-01	0.00E+00	8.50E-01	3.01E-03	0.00E+00	9.39E-02	9.69E-02	3.20E-02	1.60E-01	3.0E+00	6.1E-01
SILVER	1.95E+01	0.00E+00	2.73E-01	6.89E-02	0.00E+00	3.02E-02	9.91E-02	6.02E+00	1.19E+02	1.6E-02	8.4E-04
ZINC	4.64E+02	0.00E+00	1.45E+02	1.64E+00	0.00E+00	1.60E+01	1.77E+01	7.54E+01	2.98E+02	2.3E-01	5.9E-02

Surface water samples were not collected so this exposure pathway is not included in the food chain model.
Cells are shaded if the value is greater than 1.0

Body Weight = (BW)	1.70E-02	kg	Dose (soil) = (Cs * Is)(H)/BW	Conc = Concentration
Food Ingestion Rate = (If)	1.88E-03	kg/day	Dose (vegetation) = (Cv * If)(H)/BW	LOAEL = Lowest Observed Adverse Effects Concentration
Water Ingestion Rate = (Iw)	7.51E-03	L/day	Dose (water) = (Cw * Iw)(H)/BW	NOAEL = No Observed Adverse Effects Concentration
Soil Ingestion Rate = (Is)	6.01E-05	kg/day	Cv = Contaminant concentration in vegetation	SW = Surface Water
Home Range = (HR)	Assume 100% on site		Cs = Contaminant concentration in soil	
Contaminated Area = (CA)	Assume equal to home range		Cw = Contaminant concentration in water	
			Total Dose = Dose (soil) + Dose (vegetation) + Dose (water)	
			H=CA/HR (Assume = to 1)	