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Focused Site Inspection

for

Surface Warfare Officers School
Naval Station Newport
Newport, Rhode Island

Engineering Field Activity Northeast
Naval Facilities Engineering Command

Contract Number N62472-03-D-0057
Contract Task Order 25

March 2006

TETRA TECH NUS, INC.

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FOCUSED SITE INSPECTION

FOR

SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT
NEWPORT, RHODE ISLAND

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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10 Industrial Highway, Mail Stop No. 82
Lester, Pennsylvania 19113-2090

Submitted by:
Tetra Tech NUS, Inc.
600 Clark Avenue, Suite 3
King of Prussia, Pennsylvania 19406-1433

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PREPARED UNDER THE DIRECTION OF:

STEPHEN PARKER, LSP
PROJECT MANAGER
TETRA TECH NUS, INC.
WILMINGTON, MASSACHUSETTS

APPROVED FOR SUBMISSION BY:

JOHN J. TREPANOWSKI, P.E.
PROGRAM MANAGER
TETRA TECH NUS, INC.
KING OF PRUSSIA, PENNSYLVANIA

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LIST OF ACRONYMS

AWQC	Ambient water quality criteria
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CVOC	Chlorinated volatile organic compounds
DUP	Duplicate
EPA	U.S. Environmental Protection Agency
ERM	Effects Range Medians
ft^2	Square feet
cfm	Cubic feet per minute
FWENC	Foster Wheeler Environmental Corporation
H_2S	Hydrogen sulfide
LCS	Laboratory control sample
LTMP	Long-term monitoring program
mL	Milliliter
MS	Matrix spike
MSD	Matrix spike duplicate
NCBC	Naval Construction Battalion Center
NOAA	National Oceanic and Atmospheric Administration
PAH	Polynuclear aromatic hydrocarbons
PAL	Project Action Limit
PCB	Polychlorinated biphenyls
PID	Photo ionization detector
ppb_v	Parts per billion by volume
ppm_v	Parts per million by volume
ppm	Parts per million
ppth	Parts per thousand
RI	Remedial investigation
RIDEM	Rhode Island Department of Environmental Management
RRF	Relative response factor
SVOC	Semivolatile organic compounds
TCL	Target compound list
µg/L	Microgram per liter
VOC	Volatile organic compounds

E.0 EXECUTIVE SUMMARY

A Focused Site Inspection (SI) was performed for the Surface Warfare Officers School (SWOS) site (the site), located at Naval Station Newport (NAVSTA Newport) in Middletown, Rhode Island.

The scope of the Focused SI was twofold: 1) to determine the source of the soil contamination (oily soils) encountered in the northern portion of the property during the 2003 construction of the SWOS Applied Instruction Building, and 2) to identify any other contaminants that may be present at the site that may pose risk to potential human receptors. Figure E-1 presents a depiction of the site and the major findings of this focused site investigation.

Field investigation activities included the advancement of 20 soil borings and the installation of five groundwater monitoring wells at the site. Forty-seven soil and six groundwater samples were collected and analyzed for organics [including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyl compounds (PCBs)], petroleum hydrocarbons, and metals. Several chemicals were detected in the soil and groundwater samples at concentrations exceeding residential risk-based screening levels derived from a combination of EPA and state regulatory criteria. These chemicals, including petroleum and polynuclear aromatic hydrocarbons (PAHs) were designated as chemicals of potential concern (COPCs).

There have been no documented petroleum releases at the site. A Navy brig was located at the site from late 1951 to 1996. Prior to 1951, the site was undeveloped. COPCs exceeded risk-based criteria in samples mostly collected from the northern portion of the site, which borders Installation Restoration Site 09, referred to as the Old Fire Fighting Training Area (OFFTA) site. The OFFTA site is currently undergoing remedial actions in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Federal Facilities Agreement (FFA) for NAVSTA Newport as a result of prior oil and hazardous material releases at that property. The primary contaminants of concern at the OFFTA site include petroleum, associated PAHs and lead. In the central portion of the OFFTA site, petroleum contamination has been visually observed in soils sampled from depths immediately above the water table.

The information collected during this Focused SI indicates that the petroleum found at the SWOS site is contiguous with that present at the adjacent OFFTA site. Elevated concentrations of PAHs were found in surface soil (believed to be associated with fill and old pavement debris) and in subsurface soil (believed to be associated with either fill or co-located petroleum). The lead contamination at the OFFTA site is isolated and discontinuous, associated with pockets of fill and remnant building debris, likely left from

construction or demolition over time. Lead is present at the SWOS site above screening criteria in five discrete locations, also associated with fill material.

The spatial distribution of petroleum at the SWOS site indicates that it is likely to be a continuation of petroleum contamination from the adjacent OFFTA site to the North. In addition, the similarities of the types of contaminants at the SWOS site (petroleum, PAHs, and lead associated with fill) indicate that remedial actions at one site will have to be undertaken with consideration of the adjacent site, regardless of how the contaminants came to be present. Therefore, the two sites are similar enough to be considered one, and future investigations or actions should be conducted accordingly.

1.0 INTRODUCTION

A Focused Site Inspection (SI) was performed for the Surface Warfare Officers School (SWOS) site (the site), located at Naval Station Newport (NAVSTA Newport) in Middletown, Rhode Island. The investigation was conducted under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract No. N62472-03-D-0057, Contract Task Order (CTO) 025 by Tetra Tech NUS, Inc. (TtNUS) on behalf of the Navy. The Focused SI was conducted to characterize the nature of environmental contamination at the SWOS site in accordance with the Federal Facilities Interagency Agreement (FFA) between the United States Environmental Protection Agency (USEPA), the Rhode Island Department of Environmental Management (RIDEM), and the U.S. Navy, for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sites at NAVSTA Newport. Response action requirements under the Department of Defense Installation Restoration Program (IRP) at NAVSTA Newport are outlined in the FFA.

1.1 SITE-SPECIFIC INVESTIGATION OBJECTIVES

The objectives of this investigation were to identify and characterize contaminants present on the SWOS site and 1) to determine the source of the soil contamination (oily soils) encountered at the north and east portions of the property during the 2003 construction of the SWOS Applied Instruction Building at the site, and 2) to identify any other contaminants that may be present at the site that may pose risk to human receptors. The possible relationship of the SWOS site to the adjacent Old Fire Fighting Training Area (OFFTA) site (Site 09) is a primary focus of this report and was based on the data collected at both sites.

The nature of the contamination at the SWOS site was evaluated by comparing chemical data to pertinent federal and state criteria as well as to the background data set established for the OFFTA site. In addition, a preliminary data assessment was performed as is consistent with the scope of a Focused SI.

The Focused SI activities included a file review, background information research (aerial photographs, land use records, etc.), a site reconnaissance survey, advancement of soil borings and installation of monitoring wells, soil and groundwater sampling and laboratory analysis, surveying, and investigative-derived waste removal. Details of these activities are provided in Section 2.0.

The scope of work for the SWOS Focused SI was developed based on information collected in support of the Phase I Environmental Site Assessment (TtNUS, 2001) and the Final Report and Risk Assessment for Worker Exposure at the SWOS Site (Foster Wheeler Environmental Corporation (FWEC), 2003). The FWEC report documents the presence of oily soils on the SWOS site during construction of the SWOS Applied Instruction Building in 2003.

1.2 BACKGROUND INFORMATION

RIDEM, Navy and TtNUS data sources were reviewed and information attained in the records search has been included in the following sections. A description and history of the site is presented below.

1.2.1 Site Location

NAVSTA Newport is located approximately 25 miles south of Providence, Rhode Island. Portions of the facility are located within the City of Newport and the Towns of Middletown and Portsmouth, Rhode Island. The facility occupies approximately 1,063 acres and the layout is long and narrow, following the western shoreline of Aquidneck Island for nearly 6 miles facing the east passage of Narragansett Bay. The SWOS site is located on the northwestern end of Coasters Harbor Island at NAVSTA Newport. The location of the SWOS site is shown on Figure 1-1. A map of the site is provided as Figure 1-2.

As depicted on Figure 1-2, Taylor Drive and the OFFTA site are located just north of the SWOS site. West of the site is Warfare Road, several buildings that make up the SWOS campus, and Narragansett Bay. South of the site is an asphalt parking lot and a number of buildings which comprise the Naval War College. Tennis courts and a gymnasium (Building 109) are located east of the site.

1.2.2 Site Description

The site is the location of the former Brig facility at NAVSTA Newport. The building served as the Correctional Center (Brig facility) from its construction in 1951 until its demolition in 1996. When in use, it was listed as Building 149 on NETC Plan No. 31490-311 prepared by Ames and Whitaker Architects (Ames and Whitaker, 1996).

The site occupies approximately 90,000 square feet. The majority of the site is currently covered either by the SWOS Applied Instruction Building (Building 1248) or asphalt paved parking. The SWOS Applied Instruction Building was constructed on site in 2003 and presently occupies an estimated 28,600 square feet, in the southern and western portions of the site, adjacent to Warfare Road. Asphalt paved parking areas border the building to the north and east.

1.2.3 Previous Site Investigations and History

To date, limited environmental investigations of the SWOS site have occurred. Though the site was not reviewed under the Final Initial Assessment Study (IAS), the Brig facility, referred to as the Correctional Center, was documented in this report as having previously been located on the site (Envirodyne, 1983).

An investigation which included the vicinity immediately west of the SWOS site was conducted and presented in the Coasters Harbor Island UST Remedial Investigation Report published in April 1995 (Halliburton NUS, 1995). A Phase I Environmental Site Assessment for the SWOS Building Site was conducted in July 2001 (TtNUS, 2001). A more recent investigation was summarized in the Final Report and Risk Assessment for Worker Exposure at the SWOS Site (Foster Wheeler Environmental Corporation, 2003).

Aerial photographs of the site dating from 1944, 1951, 1962, 1992, 1996 and 1997 were reviewed. Information gathered from these photos is presented in the SI work plan. In summary, aerial photography confirms that prior to 1951, the site was undeveloped. Until its demolition in 1996/1997, the Brig facility was the primary structure on the site. Activities on the site appear to have been limited to the facility, and no connection to contamination at the OFFTA site (i.e. visible soil staining or the presence of OFFTA related structures on the SWOS site) is evident in the aerial photographs. The development of surrounding areas to the SWOS site are evident. Historic observations do not indicate evidence of activities that may have caused potential site contamination. Current site conditions are not represented in an available aerial photograph.

1.2.3.1 Coasters Harbor Island UST Remedial Investigation Report

The Coasters Harbor Island UST Remedial Investigation Report, published in April 1995 (Halliburton NUS, 1995), addressed the potential sources of contamination in the area along Taylor Drive and in the vicinity of Structure 143 which is located immediately west of the SWOS site. The abandoned fuel line between Building 86 (the boiler house) and Building A138 (containing a mock-up of a ship's boiler), located west-southwest of the site, as well as the area to the south of the site surrounding Structure 74, were also addressed in the Report (Figure 1-2).

Associated investigation activities included the collection of soil and groundwater samples, in addition to the inspection of manholes, to document the presence of contamination. Lead was detected in two groundwater samples collected near Taylor Drive at concentrations exceeding the US EPA Drinking Water Standard Maximum Contaminant Level (MCL). Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and total petroleum hydrocarbons (TPH) were detected in groundwater and soil samples at concentrations below State and Federal action levels. TPH was detected in soil sampled from under Taylor Drive at concentrations of 550 milligrams per kilogram (mg/kg) (ENSR-2) and 760 mg/kg (ENSR-1) (Halliburton NUS, 1995).

The presence of free-phase hydrocarbons at the top of the water table in five monitoring wells was documented in the immediate vicinity of Structure 74 and slightly to the north beneath Porter Avenue, thus

confirming a release of fuel oil at Structure 74. Underground utilities, including storm drain lines and the associated fuel line pipe chase, did not appear to be conduits for the migration of free-phase hydrocarbons (Halliburton NUS, 1995).

In response to the findings of this investigation, an interim free-product recovery system was installed immediately north of Structure 74, in the spring of 1995. The low concentrations of petroleum found in the vicinity of Taylor Drive were attributed to the OFFTA site.

1.2.3.2 Phase I Environmental Site Assessment

The Phase I Environmental Site Assessment (ESA) for the SWOS Building Site (TtNUS, 2001) was performed prior to the construction of the SWOS Applied Instruction Building. Environmental conditions were evaluated through a review of available records and a site reconnaissance. No releases of oil or hazardous materials were reported to have occurred at the SWOS site nor were disposal areas present at any time.

The presence of transformers historically known to be sources of polychlorinated biphenyl (PCB) contamination, light ballasts containing PCBs, lead-based paint and asbestos-containing materials (ACM) have been located in the vicinity of the SWOS site. However, a review of records and a site reconnaissance suggest that these should not be considered a source of contamination. Light ballasts, lead-based paint, and ACM were associated with the Brig building demolition debris, which was reportedly removed from the site. The transformers identified in the Phase I ESA are located northwest of the SWOS building, not within current site boundaries, and were not addressed as part of this Focused SI.

1.2.3.3 Final Report and Risk Assessment for Worker Exposure at the SWOS Site

In 2003, soil excavation activities associated with the installation of subsurface utility lines during the construction of the SWOS Applied Instruction Building detected the presence of oily soils in areas adjacent to Taylor Drive. The type of oil found is unknown. Soil sampling was conducted in May and July 2003 and a risk assessment was performed to ascertain the extent of construction worker exposure risks during utility line installation and asphalt parking lot construction activities. All samples were analyzed for Target Analyte List (TAL) metals and Target Compound List (TCL) constituents: VOCs, SVOCs, pesticides, and PCBs. The analytical results were compared to RIDEM Industrial/Commercial (I/C) Direct Exposure Criteria. One sample contained a lead concentration that exceeded the RIDEM I/C Criteria of 500 parts per million (ppm) and three samples contained TPH concentrations that exceeded the RIDEM I/C Criteria of 2,500 ppm. The risk assessment calculated the construction worker hazard index (HI) to be 0.033, which is below the USEPA's Threshold HI of 1.0 and, therefore, is unlikely to be associated with

adverse health effects. The Final Report and Risk Assessment for Worker Exposure at the SWOS Site fully describes the details of the risk assessment findings (Foster Wheeler Environmental Corporation, 2003).

As determined in the Phase I ESA and of relevance here, there are no records indicating that underground storage tanks (USTs) or above ground storage tanks (ASTs) were present at the former Brig facility nor are there records of Oil and Hazardous Material (OHM) storage at the facility. The former Brig facility was connected to the NAVSTA sewer system (TtNUS, 2001). There are no identified septic waste disposal or hazardous material disposal areas on the property (TtNUS, 2001).

1.2.4 Potential Adjacent Contaminant Sources

There are several potential adjacent sources that may represent a threat of contamination to the SWOS site. The OFFTA site (Site 09), located directly north of Taylor Drive and the SWOS site (see Figure 1-2) may represent a significant threat of contamination to the SWOS site due to the proximity and nature of contaminants located there. A Remedial Investigation/Feasibility Study (RI/FS) has been conducted at the OFFTA site under CERCLA and the NAVSTA FFA between the U.S. Navy, USEPA, and RIDEM. Soil sample analytical results presented in the Feasibility Study for the OFFTA site indicate the presence of SVOCs, metals and one pesticide at levels that exceed the RIDEM Residential Direct Exposure Criteria for soil. Analytical results for groundwater samples indicate the presence of one metal and one VOC which exceed the federal Maximum Contaminant Levels (MCL) for drinking water criteria (TtNUS, 2002).

Elevated arsenic concentrations (exceeding RIDEM criteria) are present in soil at the OFFTA site. A Background Soil Investigation conducted for the OFFTA site provided calculated background concentrations of arsenic at Coasters Harbor Island. These levels of arsenic are believed to be attributable to the composition of the local and regional bedrock formations and the shallow depth to bedrock in the area (TtNUS, 2000). The potential presence of elevated arsenic (exceeding RIDEM criteria) in the surface and subsurface soils at the SWOS site would likely be attributed to natural background conditions since there has been no history of releases involving arsenic.

Structure 74 has historically been identified as a source of hydrocarbon contamination (RAB, 1999). Available records indicate that Structure 74 consisted of a double chamber tank which contained Number (No.) 6 fuel oil from the time of construction, in 1917, until 1988, when the fuel type was converted to No. 4 fuel oil. Structure 74 is located approximately 1,000 feet south of the SWOS site, in the central portion of Coasters Harbor Island (see Figure 1-2). A release of No. 4 fuel oil was reported in 1989 and the southern tank, Tank 9, was emptied and later closed in place with foam. An interim pump and treat system was installed. Tank 10, the northern tank, remained in use until its closure in February 2005. Both Tanks 9 and 10 have been removed (EMAC Engineers, Inc., 2005).

Groundwater has been determined to flow in a radial arc from the vicinity of Structure 74 towards the northwest, north and northeast (Halliburton NUS, 1995). Sample results from a Site Investigation Report for Structure 74, published in July 2005, reported groundwater concentrations of VOCs and SVOCs below the GB Groundwater Objectives in groundwater downgradient of the tank structure. Detected concentrations of TPH-diesel range organics (DRO) in these downgradient wells ranged from 250 µg/L to 360 µg/L (LFR Levine-Fricke, 2005).

A District Public Works Office map dated December 1951, and titled "Pilot Plan and Location Plan: 75 Man Brig" (NETC No. 11169-118; Cull and Robinson, 1951), depicts the now former locations of two potential sources of contamination southwest of the Brig facility. A transformer vault, labeled Building 84, was located approximately 800 feet southwest and directly adjacent to the bay. An area labeled "fuel tanks" was located approximately 400 feet directly west of the south corner of the former Brig building, behind former Building 138 (TtNUS, 2001). The approximate area of the "fuel tanks" is identified on Figure 1-2. An aerial photograph from 1962 showing the former Brig building as well as the former Building 138 is provided in Appendix A. A review of available information did not reveal the types of petroleum products that were stored in this area. Recent maps do not depict either of these structures, indicating that they may have been closed and may no longer exist (NETC No. 31491-311; Ames and Whitaker, 1996). A site reconnaissance conducted January 24, 2006 by TtNUS did not locate evidence of tanks immediately east of Building A138.

2.0 FIELD INVESTIGATIONS

This section presents a summary description of the site investigation activities that were conducted as part of the SWOS Focused SI. Data for this soil and groundwater investigation were collected as described in the Work Plan for Focused Site Inspection, Surface Warfare Officers School (TtNUS, January 2005). All sampling, quality control, and decontamination procedures, etc. described in the work plan were followed, with exceptions as noted in this section. Sample analytical results are presented in Section 4 of this report.

2.1 INTRODUCTION

Three main tasks were performed during the Focused SI. These tasks included: 1) a reconnaissance survey and records search, 2) a geologic/hydrogeologic investigation and environmental sampling, and 3) a land survey. The details of each task are described in the following sections.

Sample locations are depicted on Figure 2-1. Photographs of the site and selected sample locations are included in Appendix A of this report. Field documentation for the site activities is provided in Appendices B and C.

2.2 TASK 1: SITE RECONNAISSANCE SURVEY AND RECORDS SEARCH

Prior to commencement of field activities a detailed records search of available documentation was performed. RIDEM, Navy, and TtNUS data sources were reviewed and information attained in the records search has been included in Section 1.0 of this report.

A site walkover was performed in March 2004 by TtNUS personnel to determine site conditions, evaluate access restrictions and locate proposed sampling locations. Construction activities associated with the SWOS Applied Instruction Building were not yet completed at the time of the site visit. Specifically, the parking lot was unpaved and mounds of dirt remained throughout the site.

2.3 TASK 2: GEOLOGIC/HYDROGEOLOGIC INVESTIGATION AND ENVIRONMENTAL SAMPLING

The subsurface exploration program was developed to address the possible areas of concern identified in the Phase I Environmental Site Assessment (TtNUS, 2001) and more recently, the Final Report and Risk Assessment for Worker Exposure at the SWOS Site (Foster Wheeler Environmental Corporation, 2003). Specifically, the sampling program was expanded to adequately characterize areas of contamination encountered during the construction of the SWOS Applied Instruction Building.

A total of 20 2-inch diameter soil borings were advanced using Direct Push Technology (DPT) following general procedures specified in TtNUS SOP No. SA-2.5. Drilex Environmental, Inc., a sub-contactor to TtNUS, utilized a truck-mounted GeoProbe SIMCO Earthprobe 200 to advance borings, as described in the work plan. Soil borings were advanced to 5 feet below the top of the saturated zone or to bedrock, as determined by the rig geologist. Soil cores, which were collected from 4-foot acetate sleeves, were described, logged, monitored and sampled, per the work plan. Soil boring logsheets are included in Appendix B.

Drilex Environmental, Inc. used a truck-mounted hollow-stem auger CME 75 with a 4 ¼-inch inner diameter to install five 2-inch diameter overburden groundwater monitoring wells. The proposed micro-wells that were discussed in the work plan were not installed due to field conditions and a request by RIDEM to not use a pre-packed screen. A field modification record (FMR) has been included for reference in Appendix C. The wells were installed per the work plan, with the aforementioned exceptions.

Well screens and sandpacks used for the overburden well installations were sized in accordance with the geologic formation at each boring location. Observations by the field geologist of the soil type and the quantity of the coarse sand fraction present in the interval to be screened determined the screen aperture size and filter pack selected. The well screens were installed in the saturated zones, and where possible, across the interval with the highest level of indicated contamination. The well construction logsheets are provided in Appendix B.

In addition to the newly installed wells discussed above, one additional monitoring well, OFF-MW05, was included in the groundwater sampling program. This monitoring well was installed as part of the investigations associated with the adjacent OFFTA site. The existing OFF-MW05 well was initially inspected and a new roadbox was constructed prior to sampling; road materials such as sand, leaves, etc. had been noted surrounding the well.

Environmental samples were collected as part of the field investigation. A total of 47 soil samples and six groundwater samples were collected as well as required quality control samples. In addition, a potential non-aqueous phase liquid (NAPL) sample was collected from one location. The samples were collected from stations selected as follows:

- Eleven soil samples from the area of contamination identified during the construction of the SWOS Applied Instruction Building, to characterize subsurface lithology, identify contaminants, and determine contaminant concentrations and the extent of impact on soil quality.

- Nine soil samples from the area west and south of the identified area of contamination, to characterize subsurface lithology, identify any waste materials that may exist, and determine contaminant concentrations and the extent of impact on soil quality.

- One groundwater sample from each of two overburden monitoring wells installed at the southern extent of the site, to determine upgradient groundwater conditions.

- One groundwater sample from each of three overburden monitoring wells installed at or immediately downgradient of the area of observed contamination, to determine groundwater conditions.

- One groundwater sample from OFFTA-MW05S, adjacent to building 158.

- One sample containing potential NAPL was collected from SB18, located immediately south of Taylor Drive, to determine chemical concentrations.

Table 2-1 presents a list of samples collected from the SWOS site. The sample locations are presented in Table 2-2 and on Figure 2-1. Sections 2.3.1 and 2.3.4 provide details of the soil and groundwater sampling procedures.

2.3.1 Soil Sampling

Soil samples were collected from 20 locations and submitted for laboratory analysis. Samples were analyzed for TCL organics (including VOCs, SVOCs, and pesticides/PCBs), gasoline range organics/diesel range organics (GRO/DRO), TAL metals and percent moisture. The analyses were conducted at Mitkem Analytical of Warwick, Rhode Island. Results are presented in Section 4.0 of this report.

The DRO analysis provides a quantification of the C-9 to C-36 hydrocarbons. The GRO analysis provides a quantification of the C-5 to C-11 hydrocarbons. As such, there is some overlapping of the DRO and GRO analyses.

Quality control (QC) samples, including five duplicates and associated blank samples, were also collected. The analytical laboratory provided method blanks as required per the analytical methods.

Two soil samples were collected from soil borings in paved areas: one from the 2-foot interval beginning immediately below the roadbase material (no less than 1 foot below the surface), and one from the 2-foot

interval just above the groundwater table (soil saturation as determined in the field). If signs of potential contamination (e.g., odors, stains, sludges) were observed at a depth between these two planned sampling intervals, the second sample was instead collected from the depth of greatest observed contamination (i.e., most stained or highest headspace screening results) below the surface interval. VOC headspace screening was performed on each sample using both a Flame Ionization Detector (FID) and a Photoionization Detector (PID) by the method outlined in the work plan.

For borings advanced in unpaved areas, the approach for sampling was similar with one exception: separate samples were collected from 0 – 1 foot and 1-2 feet bgs.

One sample was not collected exactly as proposed in the work plan. Proposed boring SB15 located at the far western edge of the site on Figure 3-1 of the work plan (TtNUS, 2005), was relocated to the east along Taylor Drive to provide additional information on the extent of contamination in that area. Samples were collected from all the other proposed sample locations.

Potential NAPL was observed in the 10-12 foot interval of SB18 located immediately south of Taylor Drive. The oily substance created a distinct, quarter-inch light golden layer at the surface of water present at the top of the acetate sleeve. An oil-water interface probe was lowered into the sleeve and through the water to provide initial screening confirmation. The potential NAPL was poured directly into a sample container and sent to the laboratory for VOC, PCB, and fuel identification/TPH analysis. A photograph of the open acetate sleeve with the possible NAPL is presented in Appendix A.

2.3.2 Water Level Measurement Round

An initial synoptic water level round was conducted on March 21, 2005 during mid-tide. A subsequent round was conducted on January 24, 2006 during high tide and another during low tide, six hours apart. A total of 22 wells, including the 5 newly installed monitoring wells at the SWOS site as well as available existing wells and piezometers at the adjacent OFFTA site, were inspected and a depth to water measurement taken using a water level indicator. As part of the well inspection procedure, an oil-water interface probe was used to confirm the absence or presence of NAPL within the well; the well inspection logsheets, located in Appendix C, detail these observations. A list of the recorded water levels for each round is provided in Table 3-1. Interpreted groundwater surface contours for the overburden aquifer during low tide and high tide are presented on Figure 3-1A and Figure 3-1B, respectively.

2.3.3 Well Development

Prior to commencing groundwater sample collection, each of the newly installed monitoring wells and one additional existing well were developed as outlined in the work plan. A Whale® pump was used to remove fines and establish a hydraulic connection with the screened formation. Repeated pumping and surging methods were performed and the groundwater extracted from each monitoring well was monitored using a YSI 600XL-B-M Multiparameter Meter to record the following water quality parameters: pH, temperature, oxidation reduction potential (ORP), specific conductance, and dissolved oxygen. Turbidity was measured using a LaMotte 2020. Development of each well was considered complete when consecutive readings of water quality parameters differed less than 10 percent, or the purging time limit had been reached. The well development data sheets are presented in Appendix C.

2.3.4 Groundwater Sampling

Groundwater samples were collected from 6 overburden monitoring wells and submitted for laboratory analysis. Samples were analyzed for full TCL organics (including VOCs, SVOCs, and pesticides/PCBs), TAL metals (total) and GRO/DRO analyses. The analyses were conducted at Mitkem Analytical of Warwick, Rhode Island. Results are presented in Section 4 of this report.

QC samples, including one duplicate and associated blank samples, were also collected. The analytical laboratory provided method blanks as required per the analytical methods.

Groundwater samples were collected using a low stress (low flow) sample collection procedure as described in the work plan. The USEPA Region I SOP for low flow sample collection (SOP GW-0001, 7/30/96, Revision 2) was followed, as practical. A bladder pump was used to collect samples from four of the newly installed monitoring wells and from the existing monitoring well. A peristaltic pump was used to collect samples from newly installed well MW-01 due to the slow recharge rate of this well.

A YSI 600XL-B-M Multiparameter Meter and a LaMotte 2020 turbidity meter were used to periodically measure water quality parameters during well purging. These measurements were recorded on “Sample Logsheets – ‘Low Flow’ Groundwater,” and are included in Appendix C. Once measured water quality parameters achieved stabilization, as described in the work plan, sample aliquots were collected using bottleware supplied by the laboratory.

The presence or absence of NAPL was determined by lowering an oil-water interface probe through the vertical extent of each well. The oil-water interface probe provides an electronic signal if non-aqueous phase liquids are encountered. Using this device, thickness of free product can be measured to 0.01 feet

accuracy, however, layers less than 0.01 feet thick can be identified. NAPL, including light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL), was not found in any of the measured wells.

2.4 TASK 3: LAND SURVEY

Following the investigative work, a survey was performed by Louis Federici and Associates, a State of Rhode Island licensed surveyor, to locate sample points and existing buildings at the SWOS site. A basemap was constructed using this information and is presented as part of Figure 2-1 of this report.

The survey was conducted to establish relative locations of sample points. Survey control was maintained by integrating into either the State of Rhode Island or United States Geological Survey (USGS) grid systems. Elevations were referenced to a USGS benchmark and the Navy mean low water level. Horizontal and vertical measurements were made relative to on-site control points.

Soil boring and monitoring well locations were surveyed. All surveyed features were horizontally located to within plus or minus 0.1 foot. Tops of PVC well risers were located to plus or minus 0.01 foot vertically. Survey data are provided in Appendix E.

2.5 INVESTIGATION-DERIVED WASTE (IDW)

Waste materials that were generated during the field investigation included drill cuttings and fluids, well purge and development water, decontamination fluids, washwater from power washing and poly sheeting.

The waste materials were containerized in 55-gallon drums and labeled as to their point of origin and date collected. All drums were located in a locked storage container onsite until removed.

Samples were collected from the drums and sent for laboratory analysis. The results were used to further characterize the waste materials, as required by federal and state disposal requirements.

At the conclusion of the project, the drums were shipped off site for disposal in accordance with USEPA, DOT and RIDEM Regulations.

2.6 DECONTAMINATION PROCEDURES

The equipment decontamination procedures described in TtNUS SOP SA-7.1 were followed in accordance with the work plan.

3.0 SITE CONDITIONS

A description of the physical conditions found during the field investigation activities performed as previously described in Section 2.0 are presented below. The analytical laboratory results from collected samples are presented in Section 4.0 of this report.

The discussions presented in this section are supported by field documentation including soil boring logsheets, well construction logsheets, and groundwater measurement data sheets which are provided in Appendices B and C of this report.

3.1 BASIC SITE CONDITIONS

The site occupies approximately 90,000 square feet and is topographically flat. The majority of the site is currently covered by either the SWOS Applied Instruction Building or asphalt paved parking. The SWOS Applied Instruction Building was constructed in 2003 and presently occupies an estimated 28,600 square feet, in the southern and western portions of the site, adjacent to Warfare Road. Asphalt paved parking areas border the building to the north and east.

3.2 GEOLOGIC CONDITIONS

The regional and site-specific conditions are presented in the following subsections. This information is based on data from previously published literature, reports of other contractors, as well as observations documented during this field investigation.

3.2.1 Regional Geology

NAVSTA Newport (and the SWOS site) is located at the southeastern end of the Narragansett Basin. This basin is a complex, synclinal mass of Pennsylvania-aged, non-marine sedimentary rocks which chiefly include conglomerates, sandstone, shale, and anthracite. Many folds and some faults occur throughout the basin, but the character and amount of folding and faulting are not clearly defined.

The bedrock of the Narragansett basin has been divided into the following five units: The Rhode Island Formation, Dighton Conglomerate, Wamsutta Formation, Pondville Conglomerate, and Felsite at Diamond Hill. At NAVSTA Newport, and most of the surrounding area, the bedrock is entirely of the Rhode Island Formation.

The Rhode Island Formation is the most extensive and thickest of the Pennsylvania formations in Rhode Island. Included within the Rhode Island formation are fine to coarse conglomerate, sandstone, graywacke, arkose, shale and small amounts of meta-anthracite and anthracite. Most of the rock is gray, dark gray, and greenish, but the shale and anthracite are often black. Crossbedding and irregular, discontinuous bedding is characteristic of the formation. In the southern portion of the basin, such as at NAVSTA Newport, rocks of the Rhode Island Formation are metamorphosed, and typically include phyllite, quartz-mica schist, feldspathic quartzite, garnet-staurolite schist, and some quartz-mica-sillimanite schist. Additionally, a few areas of thick conglomerates within the Rhode Island Formation have been found in the southern part of the basin. These conglomerate layers consist of pebbles, cobbles, and boulders, interbedded with sandstone and graywacke, and are gray to greenish in color. These stones are predominantly quartzite and have been elongated as a result of tectonic forces in the southern portion of the basin.

Overlying the bedrock of the Narragansett Basin are surficial deposits of Pleistocene sediments. These sediments owe their origin to the Wisconsin glaciation which covered the area with ice several thousand feet thick. As the glaciers receded, they deposited unconsolidated glacial materials of variable thicknesses throughout the Narragansett Basin area. The glacial deposits are primarily comprised of till and outwash. The glacial till consists of a poorly sorted mixture of sand, gravel, silt, and boulders, whereas glacial outwash consists of stratified deposits of sand, gravel and cobbles laid down by streams as the glaciers melted.

3.2.2 Site Geology

The site geology is characterized from the evaluation of 20 soil borings (SB01-SB20) advanced during the Focused SI. Documentation of the five pre-construction borings advanced in 1951 in preparation of the Brig facility (NETC No. 11169-118, Cull and Robinson, 1951) were reviewed for general reference purposes only. The boring logsheets from the Focused SI indicate that the material directly below the asphalt or grass surface consists of fill overlying sand and silt with varied amounts of gravel, which in turn overlie glacial till. Fill is present up to 8 feet below ground surface. The fill consists of sand to silt with construction debris (brick, wood, metal, concrete and asphalt). The soil below the fill consists of silt and sand, with gravel present in most of the borings. As described in most boring logsheets, the natural soil overlies a layer of till, which was generally described as a dense gravelly silt with some sand. Bedrock was encountered in a number of the borings and based on field observations, appears to be a phyllite.

The bedrock in this area of Coasters Harbor Island has been mapped and described as Purgatory Conglomerate which is believed to be in contact with the Rhode Island Formation. The bedrock may contain localized units of sandstone. In the southern portion of the Narragansett Basin, such as in the vicinity of NAVSTA Newport, the Rhode Island Formation is metamorphosed and consists of

metaconglomerates and metasandstones, as well as schist, carbonaceous schist, phyllite, and graphite (TtNUS, 2002).

3.3 HYDROGEOLOGIC CONDITIONS

The regional and site-specific hydrogeologic conditions are presented in the following subsections. This information is based on data from previously published literature, reports of other contractors, as well as observations documented during this field investigation.

3.3.1 Regional Hydrogeology

Groundwater on Aquidneck Island is obtained from the unconsolidated glacial deposits of till and outwash and from the underlying Pennsylvanian bedrock. Throughout the area, depth to groundwater ranges from less than 1 foot to approximately 30 feet, depending on physical and temporal location. Average depth to groundwater is approximately 14 feet on Aquidneck Island, and moves from areas of high elevations to Narragansett Bay and the Sakonet River.

Groundwater at NAVSTA Newport, located on the western slope of Aquidneck Island as well as on Coasters Harbor Island, is shallow - less than 10 feet in most areas. Groundwater in this area generally flows west into Narragansett Bay. Soils in this area have permeabilities that are moderate to high, and do not restrict vertical movement of water. Due to the highly fractured nature of the Pennsylvanian bedrock in this area, the natural flow of water in the bedrock aquifer likely follows a generalized east to west path.

Many areas on Aquidneck Island obtain potable water from wells. Well yields in the unconsolidated glacial till and outwash deposits range from 1 to 120 gallons per minute (gpm). Although till is considered an unconsolidated deposit, the upper limit of this well yield is likely from an outwash deposit that is well sorted and stratified. Till wells typically yield a few hundred gallons of water per day, or less than 1 gpm. Bedrock well yields range from less than 1 to as much as 55 gpm and are highly dependent on the presence of joints and fractures. Most groundwater in this area is considered to be soft or moderately hard. In scattered locations, pumping has led to saltwater intrusion.

The RIDEM has established a state groundwater classification system to protect its groundwater resources. The groundwater at the SWOS site is classified as GB (RIGIS, 1997). Groundwater classified as GB may not be suitable for drinking water without treatment, because of known or presumed degradation. Groundwater classified as GB is typically located in highly urbanized areas.

The information provided in this section has been adapted from the Final Report and Risk Assessment for Worker Exposure at the SWOS Site (Foster Wheeler Environmental Corporation, 2003), Phase I Environmental Site Assessment for SWOS Building Site (TtNUS, 2001), UST Remedial Investigation Report Coasters Harbor Island (Halliburton NUS Corporation, 1995) and the Final Initial Assessment Study report (Envirodyne, 1983).

Area Water Use

Public water in the City of Newport and the Town of Middletown is supplied and managed by the Newport Water Department. The Town of Portsmouth purchases water from the Newport Water Department, but operates its own distribution system. Approximately two-thirds of Portsmouth is serviced by public water while the remaining one-third is supplied by water from private wells. The majority of private wells are reportedly located on the eastern portion of Aquidneck Island.

The Newport Water Department receives its water supply from a series of seven surface water reservoirs located on Aquidneck Island and two surface water reservoirs on the mainland. Each of the reservoirs is supplied water via rainfall and runoff and is not augmented by groundwater supply wells. No surface water reservoirs are located on or downgradient of the site.

3.3.2 Site-Specific Hydrogeology

Hydrogeologic conditions at the SWOS site were evaluated through the determination of potential groundwater gradients at both the SWOS and OFFTA sites.

3.3.2.1 Groundwater Gradient

A network of groundwater measurement points was used to develop a groundwater surface gradient map for the site. Measurement points included overburden groundwater monitoring wells installed on the SWOS site during this field investigation in addition to pre-existing available monitoring wells and piezometers at the OFFTA site. The five groundwater monitoring wells installed during this Focused SI were each completed in the overburden, as described in Section 2 of this report. An initial water level measurement round, conducted during mid-tide on March 21, 2005, included nine pre-existing overburden monitoring wells and three pre-existing bedrock wells, in addition to the five newly installed SWOS site overburden monitoring wells. Two subsequent water level measurement rounds, one conducted during low tide and one conducted during high tide, on January 24, 2006, included 13 pre-existing overburden monitoring wells (11 during the low tide round), two pre-existing bedrock wells and two piezometers. Two of the 13 pre-existing overburden monitoring wells measured in January 2006 included SD-1 and SD-2

which were installed along Cushing Road as part of the Coasters Harbor Island UST Remedial Investigation in August 1994.

Elevations of monitoring wells were measured by a licensed professional land surveyor to a precision of 0.01 feet. The elevations were measured using a reference point marked on the PVC well casing, located inside the protective metal casing. Using the elevation reference point and an electronic detector, groundwater depths were measured. Depths were then converted to elevations using the surveyed elevation of the reference point on the PVC. Groundwater level measurements in monitoring wells and piezometers are presented on Table 3-1. Groundwater elevations for only the overburden monitoring wells were then plotted on the site basemap to depict the approximate surface gradient of the overburden groundwater aquifer. Interpreted groundwater surface contours during low tide and high tide are presented on Figure 3-1A and Figure 3-1B, respectively.

Based on observations documented during the Focused SI, groundwater at the SWOS site appears to generally flow north, north–northwest, and north–northeast (toward Narragansett Bay and Coasters Harbor, respectively). In addition, recorded observations indicate that groundwater in the overburden aquifer beneath the SWOS site is not tidally influenced. Groundwater levels measured across the site at different stages in the tidal cycle remained constant. The depth to groundwater on the site, as measured on March 21, 2005, ranges from approximately 4.8 to 8.3 feet below the PVC well casings.

It is noted that a slight downward vertical gradient from overburden to bedrock was measured at the two overburden/bedrock well clusters that were included in the March 2005 water level round (OFF-MW-6S/6R and OFF-MW-11S/11R). Conditions noted by geologists conducting bedrock borings in previous investigations indicate that groundwater is likely to be exchanged easily between overburden and bedrock. The highly fractured bedrock surface, the degradation of that rock, the variability of the orientation of fractures within the rock, as well as the discontinuous nature of the possible overlying till layer all indicate that little to no natural barrier exists between the overburden and bedrock aquifers that would prevent the migration of potentially contaminated groundwater.

4.0 CONTAMINANT DISTRIBUTION

An abbreviated evaluation of the contaminants found in samples collected in support of the Focused SI is presented below. A complete set of the analytical data is provided in Appendix D for reference.

4.1 SOIL CONTAMINANT DISTRIBUTION

Soil borings were advanced on the site to characterize soil conditions. The boring locations are depicted on Figure 2-1 and a summary description of each location is provided on Table 2-2. A description of the soil boring information, including depth of fill and samples collected, is provided in Appendix B.

Analytical results from each of the soil samples collected were compared to EPA Region IX Preliminary Remedial Goals (PRGs) for Residential Soil (EPA, 2002) and RIDEM Direct Exposure Criteria for Residential Soil (RIDEM, 2004). The more conservative value from each of these screening criteria was selected as the Project Action Limit (PAL) for the site. The PALs are defined as those criteria which indicate a possible risk for exposure under specific conditions. These conditions would include the soil being accessible to residential receptors on a continuous basis for a set number of years. The exact conditions are not defined in this SI report, as the situation is only theoretical – there are no residential receptors present at this time. The screening criteria were selected as PALs as conservative indicators only.

Table 4-1 presents all detected soil contaminants. Detected concentrations are presented with a grey background and analytical results exceeding criteria are presented with a black background. Inorganic soil sample concentrations have also been compared to the background data set established for the adjacent OFFTA site (TtNUS, 2000), for reference. The comparison of surface soil to background surface soil concentrations is presented on Table 4-2. Background concentrations used were the 95 percent upper tolerance limits (UTLs) described in the Background Soil Investigation Report for Site 09 (TtNUS, 2000). The subsurface soil background comparisons are presented on Table 4-3.

For the purposes of this report, the evaluation of the soil has been divided into surface and subsurface samples. Soil of at least two feet below ground surface is considered subsurface, unless otherwise specified; for example, in paved areas, surface soils are considered to be typically 1 to 3 feet bgs. Materials used for road construction were omitted from the evaluation process. In paved areas, the top two feet of soil were defined to begin 1 foot below asphalt and associated roadbase materials, as described in the work plan and Section 2 of this report.

4.1.1 Surface Soil

At least one surface soil sample was collected from each of the 20 soil boring locations. Two surface soil samples were collected from each unpaved location (one each from 0 to 1 and 1 to 2 feet bgs), and one surface sample from each asphalt location (generally 1 to 3 feet bgs). A total of 27 surface soil samples, plus five quality control samples were collected.

4.1.1.1 Volatile Organic Compounds

Three volatile organic compounds (methylene chloride, styrene, and trichlorofluoromethane) were detected in one or more surface soil samples. Methylene chloride, a common laboratory contaminant, was detected in locations SB01 through SB08 at concentrations equal to or less than 13 µg/kg. Both styrene and trichlorofluoromethane were detected at trace levels at one location each, SB13 and SB19, respectively. The detected concentrations for these VOCs did not exceed the PALs.

4.1.1.2 Semivolatile Organic Compounds

SVOCs were detected in one or more surface soil samples at every location. Seven SVOCs, all polynuclear aromatic hydrocarbons (PAHs), including benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; chrysene; dibenzo(a,h)anthracene; and indeno(1,2,3-cd)pyrene, were detected in one or more surface soil samples at concentrations exceeding the PAL. Benzo(a)pyrene was detected in every location (except for SB09) at concentrations in exceedance of the PAL. Locations SB03, SB14 and SB15, positioned east to west across the center of the site, as well as SB08, located to the north of the site along Taylor Drive, were the only borings containing multiple SVOC detections at concentrations exceeding the PAL.

Total PAHs were calculated for each sample (soils and groundwater) and are presented on Figure 4-1. PAHs were detected in surface soil samples from each of the 20 soil boring locations, and ranged in concentration from 292 µg/kg (SB09) to 34,204 µg/kg (SB14). The total PAH value detected in SB14 is 5 times the next highest detection of 6,456 µg/kg in SB03. A PAL has not been established for total PAHs.

Petroleum hydrocarbons measured as Diesel Range Organics (DRO) were detected in surface soil samples from every location (except for SB06) at concentrations ranging from 20 mg/kg (SB04 and SB09) to 480 mg/kg (SB07). DRO results for surface soils were compared to the Rhode Island Residential Direct Exposure Criterion of 500 mg/kg. Detected surface soil DRO concentrations are all below this criterion. Gasoline Range Organic (GRO) compounds were also measured in soil samples, as a part of the petroleum hydrocarbons analysis. No significant detections of GRO were reported.

4.1.1.3 Pesticides/PCBs

A total of nine pesticides were detected in surface soil samples from 13 locations (SB08 through SB20). Pesticides were not detected in samples collected from the northeast corner of the site, in the area west and south of Building 158. 4,4'-DDE was detected in 12 locations (SB09 through SB20) and 4,4'-DDT was detected in 10 of these 12 locations. PCBs were detected in surface soils at only one location, SB16, where Aroclor-1260 was present at a concentration of 63 µg/kg. Detected pesticide/PCB concentrations did not exceed their respective PALs.

4.1.1.4 Metals

Metals were detected in surface soils at each of the 20 soil boring locations. Nine of the 22 detected metals were present at concentrations exceeding the PAL. Arsenic, iron and manganese were detected at concentrations exceeding the PAL in samples collected from each location. Thallium was detected in samples from each location, however, the thallium data from location SB06 was determined to be not reliable after validation.

A Background Soil Investigation for OFFTA (TtNUS, 2000) was performed to determine soil conditions on Coasters Harbor Island in areas that have not been impacted by site-related activities. The samples were collected south of both the OFFTA and SWOS sites and the calculated 95% UTL "background levels" provide a baseline for both surface soil and subsurface soil metals comparison. Surface soil detections from the Focused SI sampling indicate that one or more compounds are present at concentrations above background levels at every location (see Table 4-2). Cadmium was the single detected metal that had concentrations below the calculated background value of 0.7 mg/kg at all locations. Locations SB04 and SB06 each had one metal detected at concentrations above background levels. All other locations had multiple metals reported at concentrations above calculated background levels.

4.1.2 <u>Subsurface Soil</u>

One subsurface soil sample was collected from each of the 20 soil boring locations. The interval with the highest apparent contamination as determined by visual observations and headspace readings was sampled and sent for analysis, per the work plan. If contamination was not observed at a boring, the subsurface soil sample for laboratory analysis was collected directly above the water table in the vadose zone.

4.1.2.1 Volatile Organic Compounds

Thirteen of the 20 soil boring locations had low levels of at least one detected VOC in subsurface soils. Methylene chloride, a common laboratory contaminant, was detected in samples collected from locations SB01 through SB07 (per table 4-1). Isopropylbenzene was detected at 4 locations, with concentrations ranging from 3 J µg/kg (SB06) to 270 J µg/kg (SB12). Two low-level detections of benzene were noted in samples collected from locations SB12 and SB13. All other detected VOCs, including carbon disulfide, chloroform, methyl cyclohexane, toluene and trichlorofluoromethane, were detected at one location each. Samples with multiple VOC detections were collected from either the 5 to 7 or the 4 to 6 foot interval, located at or directly above the water table, and were geographically clustered to the north-northeast of the site, in the vicinity of Taylor Drive.

Detected VOC concentrations did not exceed PALs.

4.1.2.2 Semivolatile Organic Compounds

At least two SVOCs were detected at every location. Nine PAH compounds, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene and naphthalene, were detected in subsurface soil at concentrations exceeding the PALs. Samples collected from 11 locations had PAH concentrations in exceedance of the PAL; 5 of those locations had multiple exceedances. The 3 to 5 foot interval of locations SB02, SB05 and SB07, positioned in pavement approximately 50 to 75 feet south of Taylor Drive in the area of historically observed contamination, showed at least 4 PAH compounds at concentrations exceeding PALs. Locations SB15 and SB16, situated directly east of the SWOS Applied Instruction Building in an unpaved area, also showed four PAH compounds at concentrations exceeding PALs.

Other SVOCs detected did not exceed PALs.

Total detected PAHs were calculated for each sample and are presented on Figure 4-1. Seventeen of the 20 locations showed total PAHs at concentrations between 41 J µg/kg (SB04 and SB14) and 46,491 µg/kg (SB12). Five locations showed calculated total PAHs above 25,000 µg/kg. Four of these 5 locations are located in paved areas near Taylor Drive, and the fifth location, SB16, is located in an unpaved location east of the SWOS Applied Instruction Building in the southern portion of the site. PALs are not been established for total PAHs, however, total PAHs are used for an indication of PAH distribution.

Petroleum hydrocarbons, measured as DRO, were detected at concentrations ranging from 15 mg/kg (SB09) to 7,200 mg/kg (SB08). DRO concentrations at seven locations exceeded the RIDEM direct exposure criteria for TPH of 500 mg/kg. GRO was detected in 7 of the 20 sampled locations. Six of the 7 locations are located in the north portion of the site, along Taylor Drive and extend as far south as the central traffic island north of the SWOS Applied Instruction Building. The seventh location, SB16, is situated in an unpaved area, directly east of the building, in the southern portion of the site. PALs have not been established for GRO. Figure 4-2 presents detected DRO and GRO concentrations.

4.1.2.3 Pesticides/PCBs

Pesticides were detected in five subsurface soil sample locations. Multiple pesticides were detected in samples collected from location SB05 and SB15. Only one pesticide was detected in samples from each of the locations SB02, SB10, and SB18. Locations SB15 and SB18 are located in grass areas. Detected pesticide concentrations did not exceed the PAL. PCBs were not detected in subsurface soil samples.

4.1.2.4 Metals

Subsurface soil results indicate that metals are present at concentrations above calculated background UTL levels in 17 of the 20 sampled locations. Most notably, lead was detected at concentrations above 150 mg/kg (ranging from 150 to 1400 mg/kg) in samples from borings where fill, including building debris, was also noted (refer to boring logs in Appendix B). Table B-1 in Appendix B summarizes the depth of fill encountered in each boring.

Figure 4-3 depicts borings where fill is present in excess of 3 feet below ground surface. The depiction of locations with fill exceeding depths of 3 feet was selected as it was presumed that contaminants associated with old pavement (concrete and/or asphalt) could be present in shallow soils (less than 3 feet below ground surface) across the entire site, due to it’s history of development and demolition (refer to aerial photos, Appendix A). While any thickness of building or pavement debris may result in elevated concentrations of metals (and PAHs), the presence of fill below 3 feet may be more significant to the interpretation of subsurface soil data.

Metals were detected in subsurface soil samples collected from soil boring locations SB12, SB14 and SB20 only at concentrations below calculated background levels.

4.1.2.5 Non-Aqueous Phase Liquid

An oily substance which appeared to be NAPL was present in water at the top of the acetate sampling sleeve for the 10-12 foot interval of SB18 and was sampled. Due to the limited recovery and resulting small sample aliquot, analyses were prioritized for VOCs, PCBs and fuel identification/total petroleum hydrocarbons. Analytical results indicate that the sample contained petroleum components which are typical of fuel products. Specifically, the laboratory analysis indicated the sample is typical of diesel fuel. Analytical results for the possible NAPL sample (SB18, 10-12 foot interval) are included at the end of Appendix C.

4.2 GROUNDWATER CONTAMINANT DISTRIBUTION

As part of the Focused SI, five overburden monitoring wells were installed and sampled to characterize overburden groundwater conditions at the SWOS site. One pre-existing well (OFF-MW05) was also sampled to provide additional information. The wells are depicted on Figure 2-1 and a summary description of each location is provided on Table 2-2. Groundwater sample logsheets are provided in Appendix B.

Analytical results from each of the groundwater samples collected were compared to the federal MCLs for drinking water, EPA Region IX PRGs for Tap Water (EPA, 2002) and Rhode Island GB Groundwater Objectives. The more conservative criteria values were selected as the PALs for groundwater. Table 4-4 presents a summary of analytical results for contaminants detected in the six groundwater monitoring wells sampled under the Focused SI. Detected concentrations are presented with a grey background and analytical results exceeding criteria are presented with a black background.

4.2.1 Volatile Organic Compounds

A total of five VOCs were detected in groundwater samples, including acetone, carbon disulfide, cyclohexane, isopropylbenzene, and methyl tert-butyl ether. VOCs were not detected in samples collected from locations OFF-MW05 or MW03, and only trace/low levels of VOCs were detected in MW02 and MW04. Acetone, a common laboratory contaminant, was detected in samples at concentrations exceeding the PAL in MW01 and MW05. No other detected VOC contaminants exceeded the PAL.

4.2.2 Semivolatile Organic Compounds

At least one SVOC was detected in groundwater samples collected from five of the six locations; SVOCs were not detected in samples collected from MW02. Detected concentrations of dibenzofuran and

naphthalene in groundwater slightly exceed the PAL in MW05 and MW04, respectively. Analytical results of samples indicate that the highest percentage of detected SVOCs are present in groundwater collected from MW04 and MW05 which are located in the northern portion of the site, near the central traffic island located northeast of the SWOS Applied Instruction Building, and just south of Taylor Drive, respectively.

Total PAHs were calculated for each sample and are presented on Figure 4-1. PAHs were detected in groundwater collected from three of the six locations: MW01, MW04, and MW05. Calculated total PAH concentrations ranged from 2 J µg/L (MW01) to 10 J µg/L (MW05). A PAL for total PAHs has not been established.

DRO was also detected in groundwater collected from three of the six locations: MW01, MW04 and MW05. Concentrations of detected DRO ranged from 0.36 mg/L (MW01) to 0.92 mg/L (MW04). Groundwater collected from MW04 and MW05 had detected concentrations of GRO as well. GRO concentrations ranged from 0.110 mg/L (MW04) to 0.120 mg/L (MW05). PALs for groundwater are not established for DRO, GRO, or TPH. Figure 4-2 presents detected DRO and GRO concentrations.

Although oily soil and a possible NAPL layer was observed in the soil and weathered bedrock sample at boring SB18 at 10-12 feet below ground surface, no NAPL layers or sheens were noted during groundwater sampling at the site. A groundwater well was installed at the SB18 location (MW05) and duplicate samples were collected (SWOS-A-MW05 and MW05-D). As shown in Table 4-4, DRO and GRO compounds were detected in these samples, however they were detected at very low concentrations, with maximums of 0.85 and 0.12 mg/L, respectively. This indicates that oil observed in the soil at this location is bound within the substrate and is not moving with groundwater as a free phase product.

4.2.3 Pesticides/PCBs

Pesticides and PCBs were not detected in collected groundwater samples.

4.2.4 Metals

Metals were detected in groundwater collected from every location. Three metals, aluminum, iron, and manganese, were detected in one or more location at concentrations exceeding the PAL. Detected manganese concentrations, ranging from 151 µg/L (MW01) to 2,740 µg/L (MW04), exceeded the PAL at all six sampled locations. Iron was detected above the PAL at three locations: MW01, MW04 and MW05. Aluminum was detected in groundwater at a concentration exceeding the PAL only at MW01.

4.3 CONTAMINANT DISTRIBUTION SUMMARY

Analytical results from soil and groundwater samples were compared to PALs selected as either EPA Region IX PRGs for Residential Soil (EPA, 2002) and RIDEM Direct Exposure Criteria for Residential Soil (RIDEM 2004) or EPA Region IX PRGs for Tap Water (EPA 2002) and Rhode Island GB Groundwater Objectives, respectively. Chemicals were detected at each sampled location, sometimes at concentrations exceeding the PAL.

There were limited VOC detections reported in both sampled media; only one VOC exceedence of a PAL was documented – acetone, a common laboratory contaminant, was detected in groundwater at concentrations exceeding the associated PAL.

In soils, one or more PAH compound exceeding PALs was detected at nearly every soil boring location, with the exception of SB09. The PAL for benzo(a)pyrene was exceeded in almost all the surface soil samples collected and in approximately half of the subsurface soil samples as well. This PAL is set very low because the compound is understood to be highly toxic.

In groundwater, PAHs were detected at two of the six locations sampled (MW04 and MW05), with only one PAH exceeding the PAL at one location (MW04).

Petroleum hydrocarbons, reported as DRO, were present in every surface and subsurface soil sample collected, with the exception of surface soil at SB06. The highest concentrations were generally in subsurface soils (below 3 feet) and were found in the vicinity of Taylor Drive. A possible NAPL was noted associated with a soil sample collected at SB18, near Taylor Drive. Low concentrations of PAHs were detected in groundwater samples collected from the co-located MW05 and nearby MW04.

PCBs were not detected in groundwater samples and were present in only one soil sample (Aroclor 1260 detected at 63 µg/kg in the surface soil collected from SB16). Pesticides were not detected in groundwater and were either not detected or were detected at concentrations below the PAL in all collected soil samples.

Metals were detected in groundwater and soil at every location and at concentrations which often exceeded the PAL or background soil concentrations. In surface and subsurface soils elevated concentrations of metals above background levels are widely distributed throughout most of the sampled locations at the site.

The distribution of contaminants in the vertical soil profile suggests there is a disconnect between surface and subsurface soil chemistry. In surface soils 0-3 feet below ground surface, the concentrations of total PAHs and DRO is generally similar across the site, with low concentrations of DRO, and generally low, but varying concentrations of PAHs. Two exceptions are noted:

- The highest concentration of total PAHs in these upper intervals was found at SB14. Brick fragments were also found in the sample, showing definite presence of fill in this sample.

- At SB07, petroleum was detected in surface soil, however, this is the location of a test pit where oily soil was initially encountered, and this previous activity may have mixed subsurface soil containing petroleum with surface soil.

Contrary to surface soil contaminant distribution, subsurface soil total PAHs and DRO concentrations are mostly elevated in the northern and northeastern portions of the site, as well as in SB15 and SB16, located on the east side of the SWOS building. Most of the locations where elevated concentrations of PAHs in subsurface soil were found were co-located with elevated concentrations of petroleum. There are two exceptions. At SB16 and SB02, elevated concentrations of petroleum were not found with the elevated concentrations of PAHs, however fill was found present in these borings, indicating the association of PAHs with fill and not petroleum at these locations. At SB16, pieces of firebrick were noted in the boring log, showing definite presence of fill in this sample, and more particularly a PAH source, since firebrick could mean presence of a demolished chimney or firebox.

The distribution of specific contaminants both horizontally and vertically at the site suggest several sources of site contaminants. Distribution of concentrations of petroleum primarily located on the north portion of the site is an indication that the source of petroleum is located just north of the SWOS site. Distribution of the lead co-located with fill indicates that the lead is present as a result of fill. Distribution of PAHs in the surface soil suggests that these PAHs are present as a result of old pavement or bedding material under pavement. Distribution of elevated concentrations of PAHs in subsurface soils indicates association with either petroleum or fill.

Historical records indicate that the SWOS site has been repeatedly subject to land development activities and as a result, the soil on the site has been extensively reworked, paved and repaved, and the site has had buildings constructed and demolished for a period of more than 60 years. Such activities have resulted in the presence of remnant building debris as found in the samples from the borings, including brick, firebrick, concrete, and asphalt in the ground, just as was found at the OFFTA site to the north.

5.0 CONTAMINANT FATE AND TRANSPORT

The fate and transport of contaminants in environmental media are determined by a variety of factors. The physical and chemical properties of contaminants and the environmental media (i.e., soil, groundwater, surface water, air) in which the contaminants are released are all factors that determine the eventual fate of these chemicals. For the SWOS site, the combination of site-related contaminants, geologic and hydrogeologic conditions, and surface features influence how contaminants released to site soils have migrated into other environmental media (i.e., the underlying groundwater, surface water bodies, and sediments) or have been transformed as the result of degradation processes.

This section briefly describes the general fate and transport processes, identifies chemicals found in on-site media, and presents an assessment of the potential fate and transport of those chemicals on and off the site. The assessment of contaminant fate and transport in this report is qualitative; additional information and field measurements would be required to provide definitive quantitative analyses.

The evaluations of contaminant fate and transport presented in this section are based on existing site conditions, interpretations of chemicals present in the environmental media, physical state of soil and groundwater contaminants, general fate and transport mechanisms, and the interpretation of the site's geologic and hydrogeologic conditions. Evaluation of fate, how contaminants migrate, and whether the potential exists for contaminants to migrate off site, were limited in this assessment because of the limited understanding of the site geology and hydrogeology.

Section 5.1 summarizes the general fate and transport processes and contaminant properties that influence fate and transport. The probable contaminant fate and transport in site soils and groundwater are discussed in Sections 5.2 and 5.3, respectively.

5.1 FATE AND TRANSPORT PROCESSES

The fate and transport processes include the migration of soil contaminants (once released or deposited) to other media (groundwater). Once these contaminants have entered into other media, different fate and transport mechanisms may occur that cause further chemical migration or transformations. This generalized discussion of fate and transport processes is provided so that the observed site-specific contamination conditions can be better characterized and understood.

5.1.1 General Fate and Transport Processes of Soil Contaminants

A variety of processes occur that may cause organic and inorganic chemicals to become immobilized, degraded, or to mobilize to another environmental medium. Some of these processes include:

- Volatilization – Chemicals having high Henry's Law coefficients or vapor pressures will readily enter (volatilize) to the ambient air rather than remaining adsorbed to the soil particles. Once in the atmosphere, the chemicals may undergo further transport through additional processes such as advection, diffusion, or dispersion. The chemicals may also be transformed through chemical processes such as hydrolysis or photolysis.

- Leaching – Chemicals may be transported downward through the soil strata by water from precipitation or by liquids that infiltrate through the soils. The leaching of chemicals from soils and the subsequent mobilization are controlled by soil properties (i.e., adsorptive capacity, organic carbon content, clay content, or specific surface area) and by chemical properties (i.e., solubility, ability to partition to other phases).

- Runoff/Erosion – In situations where the chemicals remain adsorbed (bound) to soil particles because of the soil or chemical characteristics, chemicals may still be mobilized from contaminated areas to other uncontaminated environmental media. Contaminants can be conveyed over land by runoff that occurs during precipitation events (solubilized in rainwater or adsorbed to suspended particles), or through the erosion of contaminated soils that are present on unstable slopes or topographic features.

5.1.2 General Fate and Transport Processes of Groundwater Contaminants

For chemicals that have migrated downward into groundwater from the unsaturated soils through precipitation infiltration and leaching, additional natural processes come into play that affect the contaminants' fate and transport in the subsurface environment. Geologic conditions greatly influence contaminant migration, providing physical avenues or barriers that could increase or retard migration.

The major contaminant transport processes in groundwater typically consist of advection, dispersion, and molecular diffusion. Advection, the bulk movement of groundwater, is the principal mechanism for contaminant transport in an aquifer. Dispersion and diffusion are secondary processes for dissolved contaminant transport. Two transformation processes are important in determining the ultimate fate of contaminants in groundwater: degradation and retardation. Each of the transport and transformation processes is briefly described below:

- Advection - The dominant transport process consists of the movement of dissolved phase contaminants or of particles within a natural fluid flow. Advection is the flow of a fluid in response to a gradient, such as pressure or hydrostatic, and contaminant transport results from the entrainment of chemicals in a flow field. Advection of dissolved contaminants in an isotropic, homogenous, porous medium results in the contaminants being transported with and migrating at the same velocity as groundwater.

- Dispersion – Dispersion is the component of transport that is related to the spatial variations in the flow path and variations in velocity that characterize groundwater movement at all scales. Dispersion results in spreading of a contaminant plume over a larger area (both parallel and perpendicular to the hydraulic gradient) than would be expected by advective transport alone.

  Dispersion results from groundwater flow around individual soil particles or lenses of material, following convoluted pathways. These torturous flow paths cause mixing resulting in chemical transport from high concentration regions to lower ones. The groundwater pathway becomes more convoluted as aquifer heterogeneity increases.

- Molecular Diffusion – Diffusion is the propensity for chemical molecules to move from regions of higher concentrations to regions of lower concentrations as the result of random thermal motion of molecules. Dissolved contaminants will migrate in response to a concentration gradient within an aquifer. Because this transport process occurs on the molecular scale, its effect is small in comparison to the forces driving the more rapid advection processes; diffusion is significant only in aquifers that have clayey sands and silts with low groundwater velocities.

- Preferential Flow – In aquifer systems, preferential pathways for groundwater flow occur due to heterogeneities in the subsurface soils and the bedrock matrix. Geologic materials that are more permeable (soils or bedrock fractures) allow the preferential flow of groundwater and chemicals through those geologic units.

- NAPL Migration - NAPL transport (if present at the site) differs from the transport of dissolved phase contaminants because it is strongly influenced by geologic features in the aquifer. NAPLs can migrate along or into geologic features in directions that differ from advective groundwater flow. In the pure sense, NAPLs will move through the subsurface and spread or be restricted by low permeability geologic units, or remain in pockets in the upper portion of the water column. Lighter NAPLs (LNAPLs) will tend to “float” or be suspended by the standing water table, and dissolve slowly into it or be transported along with groundwater flow. Dense NAPLs (DNAPLs) may sink and migrate along the top of less permeable stratified units or along the top of the

bedrock surface layer, until another preferential pathway is encountered. Although a possible LNAPL was identified in soil at SB18, this material was not measurable in co-located and nearby groundwater wells. Therefore, it is likely to be residual NAPL left from old releases, and is now bound within the soil matrix.

- Biological Degradation – The degradation of organic groundwater contaminants can occur by biotic and abiotic means. In biological degradation (biodegradation), microorganisms utilize available chemicals to obtain needed energy and nutrients through reduction-oxidation (redox) reactions (or simply, through the transfer of electrons). Depending on the microorganisms and contaminants present, biodegradation can occur in groundwater under either aerobic or anaerobic conditions.

Under aerobic conditions, carbon (as organic compounds, whether naturally occurring or anthropogenic) is oxidized by microorganisms to provide a net energy gain that is necessary for growth and reproduction. Typically, low-molecular weight and soluble organic compounds are readily degraded by bacteria and fungi. Aromatic hydrocarbons (i.e., BTEX compounds) are used by microorganisms as a primary substrate (electron donor). Dissolved oxygen is used as the primary electron acceptor (chemical reduction) by the aerobic microorganisms. Once the oxygen is depleted, anaerobic microorganisms (bacteria) use other available electron acceptors, causing those chemicals to be transformed to a reduced state. Nitrate is converted to nitrogen gas or ammonia, ferric iron (Fe [III]) to ferrous iron ([II]), manganese ([IV]) to manganese ([II]), sulfate to sulfide ion, chlorinated solvents to compounds with one less chlorine atom, and carbon dioxide to methane.

Through the degradation processes, chemicals that were not originally present at the site may be produced. In some cases, these daughter products may be more toxic than the original compounds released at the site.

- Abiotic Degradation - Mechanisms of abiotic degradation include hydrolysis, oxidation, and reduction. Hydrolysis is the process where a chemical molecule and a water molecule are both split and recombine to form new chemicals. Oxidation consists of the loss of electrons by an organic compound or by a metal ion. Reduction is the chemical reaction whereby an organic compound or a metal gains electrons. Thus subsurface contaminants may be degraded or transformed by these abiotic processes that occur naturally. The dominance or effectiveness of these transformation processes are governed by factors such as temperature, pH, solubility, etc.

- Retardation - In groundwater, adsorption-desorption reactions lead to retardation of the rates at which contaminants migrate with advective groundwater flow. During contaminant migration

through an aquifer, an organic molecule may adsorb to stationary soil particles, to iron oxyhydroxide or to organic coating on the particles, thus slowing the chemical's transport with the groundwater flow. Only after desorption will a contaminant rejoin the groundwater flow. The retardation factor (R) is governed by the partition coefficient (Kp) of organic compounds or by the distribution coefficient (Kd) of metals between the sorbed state and the dissolved state. These coefficients are available in reference books or may be measured in the laboratory using site-specific samples.

5.2 CONTAMINANT FATE AND TRANSPORT IN SITE SOILS

Presence of petroleum and associated PAH compounds at the SWOS site indicate a past release of petroleum to the subsurface via adjacent properties. In addition, lead, which is not a naturally occurring metal in the concentrations detected at the site may be a result of past fuel use or a result of formerly demolished buildings and associated building debris found. Depending on a variety of factors, some of these chemicals have been mobilized and have migrated into groundwater.

5.2.1 PAHs Fate and Transport in Soils

PAHs were detected in site soils at both shallow and subsurface depths. PAHs are typically non-volatile or have low volatility, and not very soluble. Therefore, PAHs are likely to remain adsorbed to soil particles and are only gradually leached by precipitation infiltration. For PAHs, biodegradation is possible, but is likely to be slow.

PAHs adsorbed to the soil particles present at the ground surface could be released to the ambient air through fugitive dust emissions. Wind erosion could cause contaminants adsorbed to soil particles to be transported offsite through advective air flow. However this process is minimized at this site due to the presence of new asphalt paving and vegetation at the site covering site soils.

5.2.2 Metals Fate and Transport in Soils

As presented in Section 4, a variety of metals were detected in site soils. The metals adsorbed to soil particles can be mobilized through fugitive dust emissions, through erosion, or through leaching to groundwater.

5.2.2.1 Soil to Air Migration

Soils present at the ground surface are subject to wind erosion and precipitation runoff that can convey the metals off site. Currently, much of the site is covered with either buildings and new asphalt pavement and the potential for fugitive dust emissions is unlikely.

5.2.2.2 Soil to Groundwater Migration

Many of the metals detected in on-site soils were also detected in the underlying groundwater. Site soil contains some metals that may be the result of building demolition, construction and or debris, and some metals that are more likely to represent those that occur naturally as components of soil minerals, as breakdown products of the parent bedrock. When subjected to precipitation, and based on the solubilities of the compounds, metals can be leached from the fill or soils and conveyed into the underlying groundwater. Metals may also be leached from the soils into groundwater through the seasonal rise and fall of the water table.

Once metals are leached from the surficial soils into the vadose zone and into the saturated soils (i.e., groundwater aquifer), the dissolved-phase metals will continue to migrate with groundwater flow. Other natural reactions may occur (i.e., sorption, reduction-oxidation reactions, etc.) that retard the rate at which the metals migrate in the subsurface.

For site groundwater, metals that exceed the PALs in groundwater include aluminum, iron and manganese. While these metals were detected in the site soils, it is difficult to determine if they are likely attributable to past onsite releases.

5.3 CONTAMINANT FATE AND TRANSPORT IN SITE GROUNDWATER

Once organic contaminants or metals enter into the groundwater, the primary transport mechanism is through advective flow. Diffusion and dispersion also can promote the migration of contaminants within the aquifers. After the organic chemicals or metals enter into the overburden aquifer, they can continue migrating with the general direction of groundwater or be removed from the aqueous phase through retardation processes.

5.3.1 <u>VOCs Fate and Transport in Groundwater</u>

Once in the overburden aquifer, the dissolved phase VOCs will be transported via advective flow and be discharged to Narragansett Bay or Coasters Harbor. As the VOCs migrate through the aquifer, their

progression could be retarded by various processes such as degradation by chemical or biological means. Attenuation through dilution can also occur through mixing with less contaminated or uncontaminated groundwater, or through the influx of precipitation infiltration. The groundwater analytical data indicates minimal presence of VOCs in groundwater, as one would expect based on the low concentrations of VOCs in associated soils.

5.3.2 PAHs Fate and Transport in Groundwater

PAHs are only slightly soluble in groundwater. PAHs will likely adsorb to organic carbon present in the soils. Review of the groundwater analytical data suggests that higher PAHs are present in groundwater in areas where elevated concentrations of petroleum were found in the soils (MW-05 and MW-04). Therefore, they are likely present as a result of PAHs in soil. The presence of PAHs in groundwater indicates a low carbon content of the water, and that some of the PAHs are partitioning out of the petroleum in the soil.

5.3.3 Metals Fate and Transport in Groundwater

Once in the aqueous phase, the metals would be conveyed with the ambient groundwater flow. As groundwater migrates through the site, some of the metals will undergo transformation processes that result in their return to an insoluble state. Reduction-oxidation, precipitation, and adsorption reactions can cause the dissolved phase ions to leave the aqueous phase.

However, some of these metals will continue to migrate with groundwater and will discharge to surface water bodies, including Narragansett Bay. As dissolved metals are discharged to the sediments, some of the metals will likely be adsorbed and removed from the aqueous phase because of interactions with organic materials, sulfides, or oxyhydroxides.

5.4 SUMMARY OF FATE AND TRANSPORT

At the SWOS site, presence of petroleum provides PAHs in soil and low concentrations of PAHs in groundwater. These PAHs may have chance to move with groundwater flow, which is presumed to be to the north, onto the OFFTA site. Some metals, including arsenic, are likely a result of natural mineralization of the parent bedrock. Other metals, including lead, are likely present as a result of man-made disturbances, such as demolition, construction and fill. Lead did not exceed human health criteria in groundwater, and arsenic was not detected in groundwater samples collected.

6.0 DATA ASSESSMENT

This data assessment summarizes the comparison of site data to selected criteria that is presented in Section 4 of this report. This summary is presented for surface soil, subsurface soil, and groundwater samples collected from the site.

Soil

COPCs were identified by comparison of site soil data to screening criteria based on the lower of EPA Region IX PRGs for residential soil exposures or RIDEM direct exposure soil screening values for residential land use. Because there is currently no restriction preventing future residential development, it is assumed that future use of the site could be residential. The site is currently a new military college facility; however, the soil sample results were evaluated with these residential screening levels as a conservative tool to assess potential risk to persons should the land use change in the future. The use of these residential screening levels is over-protective for current or future commercial workers, school attendees, recreational visitors, and trespassers.

Groundwater

COPCs were identified by comparison of site groundwater data to screening criteria based on the lower of EPA Region IX PRGs for tap water, federal maximum contaminant levels (MCLs), national secondary drinking water standards or RIDEM direct exposure criteria for groundwater screening values for GB-classified water.

Contaminants were selected as COPCs if their maximum detected concentration exceeded any of the media-specific screening criteria described above. Background concentrations for metals (95% UTL calculated values) were used to eliminate COPCs present on site at concentrations below background concentrations for the adjacent OFFTA site.

Calcium, magnesium, and potassium are considered essential nutrients and were therefore not selected as COPCs. Aluminum, cobalt, copper, and iron were not selected as COPCs since EPA Region I does not advocate quantitative risk assessment for these contaminants. Acetone presence in groundwater samples was considered a result of laboratory contamination, and therefore acetone was not selected as a COPC.

Total chromium present was screened using the EPA Region IX PRG value for hexavalent chromium. The EPA Region IX PRG for hexavalent chromium was selected to be conservative in the absence of chromium speciation data.

Tables 6-1 through 6-4 summarize the results of the COPC screening process as well as present the frequency of detection, minimum and maximum concentrations detected, and the sample location of the maximum detected concentration. Contaminants were selected as COPCs if their maximum detected concentration exceeded the selected screening criteria and they were present above background concentrations.

The following chemicals were identified as surface soil COPCs based on a comparison of maximum site surface soil concentrations to risk-based COPC screening levels for residential land use:

- PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene;

- Metals: antimony, arsenic, beryllium, chromium, lead, manganese, and thallium.

COPCs identified above were compared to the background surface soil data set available from the Background Soil Investigation for the OFFTA site (TtNUS 2000). No surface soil COPCs were eliminated based on the comparison to background surface soil concentrations.

The following chemicals were identified as subsurface soil COPCs based on a comparison of maximum site subsurface soil concentrations to risk-based COPC screening levels for residential land use:

- PAHs: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene;

- Metals: antimony, lead, and thallium.

COPCs identified above were compared to the background surface soil data set available from the Background Soil Investigation for the OFFTA site (TtNUS 2000). Arsenic, beryllium, and manganese were eliminated as COPCs in subsurface soil because the maximum detected site concentrations of these metals were less than the subsurface soil background concentrations.

The following chemicals were identified as GW COPCs based on a comparison of maximum site groundwater concentrations to risk-based COPC screening levels for groundwater:

- SVOC: dibenzofuran
- PAHs: napthalene
- Metals: aluminum, iron, and manganese.

7.0 CONCLUSIONS

The Focused Site Inspection performed at the Surface Warfare Officers School site was conducted to identify the presence of contaminants in soil or groundwater at the site and determine a likely source of those contaminants.

Analytical results from 47 soil samples were compared to EPA Region IX Preliminary Remedial Goals (PRGs) for Residential Soil (EPA, 2002) and RIDEM Direct Exposure Criteria for Residential Soil (RIDEM, 2004). Analytical results for six groundwater samples were compared to EPA Region IX PRGs for Tap Water (EPA, 2002), federal Maximum Contaminant Levels (MCLs), and Rhode Island GB Groundwater Objectives. This is a very conservative screening process for identification of potential contaminants of concern since the current and projected land use of the site is not residential. Contaminants exceeding these criteria were identified as contaminants of potential concern (COPCs). Some COPCs were then eliminated based on comparison to background data, and some (nutrients) were eliminated because they are not anticipated to cause any negative effects to potential receptors.

COPCs selected by this screening process were limited to the following:

SVOCs:

- dibenzofuran

PAHs:

- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- benzo(g,h,i)perylene
- chrysene
- benzo(k)fluoranthene
- dibenzo(a,h)anthracene
- indeno(1,2,3-cd)pyrene
- naphthalene

Metals:

- aluminum
- antimony
- arsenic
- beryllium
- chromium
- lead
- iron
- manganese
- thallium

Arsenic, beryllium, and manganese should be considered for elimination as COPCs for soil; the "elevated" concentrations for these metals were found in onsite surface soil samples (surface soil background values are lower than subsurface background values), however, the levels were within the same range of concentrations as background subsurface soil locations. Because the SWOS site has been developed and redeveloped at least twice, the soils previously in the subsurface may have been brought to the surface. In that situation, the concentrations of these metals would be considered naturally occurring, or background.

In addition, petroleum hydrocarbons, measured as diesel range organics (DRO) were detected in the site soils at concentrations exceeding RIDEM residential criteria of 500 mg/kg. DRO were also reported at concentrations above the commercial industrial criteria of 2500 mg/kg at four locations: SB08, SB12, SB13, and SB18.

With two main exceptions (SB02 and SB16), the distribution of PAHs exceeding criteria in subsurface soils (below 3 feet) generally coincides with the distribution of elevated levels of petroleum and shows that elevated levels of petroleum and PAHs are present in subsurface soils primarily in the north-central portion of the site, near the SWOS main driveway entrance. This area is directly south of the OFFTA site.

Based on the distribution of the data presented in this report, the elevated levels of PAHs and petroleum in subsurface soil appear to be primarily contiguous with the petroleum present at the OFFTA site to the north. This observation is supported by the data available from the OFFTA Soil Predesign Investigation Report (TtNUS, 2004), Addendum (TtNUS, 2005), and the Coasters Harbor Island UST Remedial Investigation (Halliburton NUS, 1995), which shows that petroleum is present in soil and groundwater at the OFFTA site and under Taylor Drive, with soil concentrations above 500 mg/kg (Section 1.2.3.1 of this report). One exception is the presence of high concentrations of PAHs at SB16 at a depth of 4-6 feet

below ground surface (bgs). While elevated concentrations of petroleum were not found at this location, fill, including pieces of fire brick were found, indicating the elevated PAHs are co-located and associated with fill. Another exception is the presence of high concentrations of PAHs at SB02 at a depth of 3-5 feet, where elevated petroleum was not found.

The OFFTA site, located directly north of the SWOS site and across Taylor Drive, has documented site contamination above RIDEM Residential Direct Exposure Criteria for soils, including metals, TPH, and SVOCs, with the most prevalent SVOCs being PAHs. Petroleum contamination was observed visually in the central portion of the OFFTA site, in soils sampled from depths immediately above the water table. Currently, remediation efforts are underway at the OFFTA site.

Lead is present at levels above screening criteria in soils from five borings at the SWOS site, all of which contained fill material and remnant building debris. This material is likely to have been left from previous construction activities or demolition of previous structures at and/or near the site over time. This is similar to conditions at the OFFTA site, where elevated levels of lead also appear to be discontinuous, and associated with remnant demolition and building debris.

PAHs in the surface soil (to a depth of 3 feet bgs) are likely to be a result of repeated paving activities and demolition of pavement. The highest concentrations of PAHs in soil not associated with petroleum show fill present in the same samples (SB14, 0’-1’ and SB16, 4’-6’).

The spatial distribution of elevated petroleum in subsurface soils at the SWOS property (and PAH contamination, where associated with this petroleum) indicates that it is likely to be a continuation of similar contamination present at the OFFTA site, to the north. Whether there were multiple release points of petroleum to the ground that have intermingled across site boundaries, or whether there was only a single release point that has migrated over time, cannot be determined by the data collected to date. Regardless, since remedial actions conducted at either OFFTA or SWOS would best be undertaken with consideration of the conditions at the adjacent site, it is recommended that continued investigations and/or remediation activities consider both properties (OFFTA and SWOS), as well as the area underneath Taylor Drive, as a single site. The data demonstrates that contaminants at the OFFTA and SWOS sites are similar and/or contiguous. The previous activities that likely led to contaminant presence at both sites are similar enough to consider both properties as one site, and to conduct any future remedial actions accordingly.

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TABLES

TABLE 2-1

SAMPLE SUMMARY
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SOIL BORINGS	SOIL BORINGS	GROUNDWATER	NON-AQUEOUS PHASE LIQUID
SAMPLE ID	SWOS-S-SB01-0103	SWOS-S-SB13-0103	SWOS-A-MW01	SWOS-A-SB18-1012
	SWOS-S-DUP01	SWOS-S-SB13-0507	SWOS-A-MW02	
	SWOS-S-SB01-0507	SWOS-S-SB14-0001	SWOS-A-MW03	
	SWOS-S-SB02-0103	SWOS-S-SB14-0102	SWOS-A-MW04	
	SWOS-S-SB02-0305	SWOS-S-SB14-0204	SWOS-A-MW05	
	SWOS-S-SB03-0103	SWOS-S-SB15-0001	SWOS-A-DUP01	
	SWOS-S-SB03-0305	SWOS-S-DUP04	OFF-A-MW05	
	SWOS-S-SB04-0103	SWOS-S-SB15-0102		
	SWOS-S-SB04-0507	SWOS-S-SB15-0204		
	SWOS-S-SB05-0103	SWOS-S-SB16-0001		
	SWOS-S-SB05-0305	SWOS-S-SB16-0102		
	SWOS-S-SB06-0103	SWOS-S-SB16-0406		
	SWOS-S-SB06-0507	SWOS-S-SB17-0001		
	SWOS-S-SB07-0103	SWOS-S-SB17-0102		
	SWOS-S-DUP02	SWOS-S-DUP05		
	SWOS-S-SB07-0305	SWOS-S-SB17-0406		
	SWOS-S-SB08-0103	SWOS-S-SB18-0001		
	SWOS-S-SB08-0507	SWOS-S-SB18-0102		
	SWOS-S-SB09-0103	SWOS-S-SB18-0406		
	SWOS-S-SB09-0709	SWOS-S-SB19-0001		
	SWOS-S-SB10-0103	SWOS-S-SB19-0102		
	SWOS-S-DUP03	SWOS-S-SB19-0608		
	SWOS-S-SB10-0305	SWOS-S-SB20-0001		
	SWOS-S-SB11-0103	SWOS-S-SB20-0102		
	SWOS-S-SB11-0305	SWOS-S-SB20-0204		
	SWOS-S-SB12-0103			
	SWOS-S-SB12-0507			
TOTAL SAMPLES	52		7	1

(1) Last four digits of soil boring ID represent depth in feet of the sample below ground surface.

TABLE 2-2

SOIL BORING/WELL INSTALLATIONS
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND
PAGE 1 OF 2

WELL/BORING NUMBER	LOCATION	WELL SCREEN INTERVAL	PURPOSE OF WELL/BORING
MW01	Southeast corner of the site, immediately adjacent to soil boring location SB09.	3.8 to 8.6 feet	Assess upgradient groundwater quality at the site.
MW02	Centrally located along the southern boundary of the site, east of the SWOS Applied Instruction Building and immediately adjacent to soil boring location SB20.	4.18 to 10.18 feet	Assess groundwater quality east of the SWOS Applied Instruction Building.
MW03	Northeast corner of the site by Taylor Drive, immediately adjacent to soil boring location SB06.	3.69 to 10.69 feet	Assess groundwater quality in area immediately downgradient of historically observed oily soils.
MW04	Northeast corner of the site, approximately 75 feet south of Taylor Drive, immediately adjacent to soil boring location SB07.	3.4 to 10.4 feet	Assess groundwater quality in area of historically observed oily soils.
MW05	Centrally located along the northern boundary of the site, immediately adjacent to soil boring location SB18.	3.75 to 8.75 feet	Assess groundwater quality in an area of observed soil contamination to determine groundwater conditions.
SB01	Northeast corner of the site adjacent to Taylor Drive.		Assess soil quality in area of historically observed oily soils.
SB02	Northeast corner of the site, immediately west of Building 158.		Assess soil quality in area of historically observed oily soils.
SB03	Northeast corner of the site, immediately southwest of Building 158.		Assess soil quality in area of historically observed oily soils.
SB04	Centrally located on the site along the northeast extent of landscaping and curbing, in the pavement.		Assess soil quality in area immediately upgradient of historically observed oily soils.
SB05	Northeast corner of the site, approximately 40 feet west of Building 158.		Assess soil quality in area of historically observed oily soils.
SB06	Northeast corner of the site by Taylor Drive, immediately adjacent to monitoring well location MW03.	MW03	Assess soil quality in area immediately northwest of historically observed oily soils.
SB07	Northeast corner of the site, approximately 80 feet west of Building 158 and immediately adjacent to monitoring well location MW04.	MW04	Assess soil quality in area west of historically observed oily soils.

TABLE 2-2

SOIL BORING/WELL INSTALLATIONS
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND
PAGE 2 OF 2

WELL/BORING NUMBER	LOCATION	WELL SCREEN INTERVAL	PURPOSE OF WELL/BORING
SB08	Centrally located along the northern boundary of the site, along Taylor Drive.		Assess soil quality in area northwest of historically observed oily soils to determine extent of contamination.
SB09	Southeast corner of the site, immediately adjacent to monitoring well location MW01.	MW01	Assess soil quality in southeastern extent of the site.
SB10	Centrally located along the eastern paved portion of the site.		Assess soil quality in southeastern extent of the site.
SB11	Northeast corner of the site by Knight Road, immediately south of Building 158.		Assess soil quality in area east of of historically observed oily soils.
SB12	Centrally located along the northern boundary of the site, along Taylor Drive and west of SB08.		Assess soil quality in area northwest of historically observed oily soils to determine extent of contamination.
SB13	Centrally located in the northern paved portion of the site.		Assess soil quality in area west of historically observed oily soils.
SB14	Center of the SWOS Applied Instruction Building to the northeast of the main entrance.		Assess soil quality in the immediate vicinity of the SWOS Applied Instruction Building.
SB15	Centrally located on the site along the northeast extent of landscaping and curbing, in the grass.		Assess soil quality in area upgradient of historically observed oily soils.
SB16	Centrally located on the site south of soil boring location SB15, in the grass.		Assess soil quality in area upgradient of historically observed oily soils.
SB17	Centrally located along the northern boundary of the site, along Taylor Drive and west of SB18.		Assess soil quality in area northwest of historically observed oily soils to determine the extent of contamination.
SB18	Centrally located along the northern boundary of the site, immediately adjacent to monitoring well location MW05.	MW05	Assess soil quality in area northwest of historically observed oily soils to determine the extent of contamination.
SB19	Centrally located in the northwest corner of the site, approximately 100 feet south of Taylor Drive.		Assess soil quality in area northwest of historically observed oily soils to determine the extent of contamination.
SB20	Centrally located along the southern boundary of the site, east of the SWOS Applied Instruction Building and immediately adjacent to monitoring well location MW02.	MW02	Assess soil quality east of the SWOS Applied Instruction Building.

TABLE 3-1

GROUNDWATER DEPTHS AND ELEVATIONS
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

Well Number	Elevation of Reference Point	Mid-Tide Measurement (March 21, 2005)			Low-Tide Measurement (January 24, 2006)			High-Tide Measurement (January 24, 2006)		
		Time	Depth to Groundwater Below Reference Point	Elevation of Water	Time	Depth to Groundwater Below Reference Point	Elevation of Water	Time	Depth to Groundwater Below Reference Point	Elevation of Water
SWOS-MW01	12.03	1250	5.05	6.98	1207	4.9	7.13	1615	4.89	7.14
SWOS-MW02	12.01	1300	3.68	8.33	1204	3.19	8.82	1608	3.16	8.85
SWOS-MW03	11.21	1345	5.4	5.81	1215	5.48	5.73	1629	5.43	5.78
SWOS-MW04	11.06	1310	5.01	6.05	1216	4.86	6.2	1631	4.84	6.22
SWOS-MW05	10.21	1350	5.38	4.83	1217	5.01	5.2	1634	5	5.21
ENSR-1	9.82	1430	4.11	5.71	1142	4.18	5.64	1639	3.82	6
ENSR-2	8.17	1305	4.06	4.11	1139	3.97	4.2	1646	3.85	4.32
ENSR-3	7.89	1410	5.25	2.64	1137	4.98	2.91	1650	4.68	3.21
OFF-MW-5	12.4	NR	6.52	5.88	1214	6.19	6.21	1626	6.18	6.22
OFF-MW-6S	13.53	1325	7.29	6.24	1211	6.76	6.77	1620	6.78	6.75
OFF-MW-6R	13.46	1330	7.4	6.06	1212	6.79	6.67	1622	6.75	6.71
OFF-MW-1R	11.39	1515	6.18	5.21	1122	5.82	5.57	1722	5.77	5.62
OFF-MW-11S	7.7	1510	3.79	3.91	1130	3.51	4.19	1702	3.43	4.27
OFF-MW-11R	7.38	1505	3.6	3.78	NM	NM	NC	NM	NM	NC
OFF-MW-102	8.49	1500	5.53	2.96	1128	5.12	3.37	1706	4.43	4.06
OFF-MW-10S	10.36	1445	7.13	3.23	1124	6.7	3.66	1716	6.32	4.04
OFF-MW-2S	NM	NM	NM	NC	1126	5.25	NC	1713	4.65	NC
OFF-MW-2D	8.59	1450	4.49	4.1	1127	4.37	4.22	1710	4.16	4.43
OFF-MW-4S	7.68	NM	NM	NC	1131	4.61	3.07	1659	4.29	3.39
OFF-PZ-01	11.59	NM	NM	NC	1133	9.03	2.56	1657	8.81	2.78
OFF-PZ-02	11.01	NM	NM	NC	1134	8.55	2.46	1655	7.82	3.19
OFF-PZ-03	7.47	NM	NM	NC	NM	NM	NC	NM	NM	NC
SD1*	7.23	NM	NM	NC	NM	NM	NC	1731	4.49	2.74
SD2*	9.8	NM	NM	NC	NM	NM	NC	1735	3.99	5.81

Notes:
All depths and elevations are measured in feet NGVD.
Monitoring well OFF-MW-3S was unable to be located. Monitoring well OFF-MW-11R was unable to be located for the January 2006 site synoptic groundwater measurement round. Piezometer OFF-PZ-03 was located beneath 6 inches of water at the time of the January 2006 measurement.

NR = Reading not recorded
NM = Not measured
NC = Not calculated
* = ENSR monitoring well installed August 1994 (Halliburton NUS, 1995)
Reference Point = Top of PVC riser

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB02	SWOS-S-SB02	SWOS-S-SB03	SWOS-S-SB03
	SAMPLE NUMBER	SWOS-S-SB01-0103	SWOS-S-SB01-0103-D	SWOS-S-SB01-0507	SWOS-S-SB02-0103	SWOS-S-SB02-0305	SWOS-S-SB03-0103	SWOS-S-SB03-0305
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	SAMPLE DEPTH (FT)	1-3	1-3	3-5	1-3	3-5	1-3	3-5
	QC IDENTIFIER	Field Dup.	Field Dup.					
	DUPLICATE		SWOS-S-SB01-0103					
PARAMETER	**PAL [1]**							
VOLATILES BY METHOD 8260B (UG/KG)								
BENZENE	600	4 U	4 U	3 U	6 U	5 U	5 U	3 U
CARBON DISULFIDE	36000	4 U	4 U	3 U	6 U	5 U	5 U	3 U
CHLOROFORM	360	4 U	4 U	3 U	6 U	5 U	5 U	3 U
ISOPROPYLBENZENE	57000	4 U	4 U	3 U	6 U	5 U	5 U	3 U
METHYL CYCLOHEXANE	260000	4 U	4 U	3 U	6 U	5 U	5 U	3 U
METHYLENE CHLORIDE	9100	12	10	12	13	4 J	5	6
STYRENE	13000[2]	4 U	4 U	3 U	6 U	5 U	5 U	3 U
TOLUENE	52000	4 U	4 U	3 U	6 U	5 U	5 U	3 U
TRICHLOROFLUOROMETHANE	39000	4 U	4 U	3 U	6 U	5 U	5 U	3 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)								
1,1-BIPHENYL		390 U	380 U	380 U	390 U	360 U	370 U	400 U
2,4-DIMETHYLPHENOL	120000	390 U	380 U	380 U	390 U	360 U	370 U	400 U
2-METHYLNAPHTHALENE		390 U	380 U	380 U	390 U	360 U	370 U	400 U
4-METHYLPHENOL	31000	390 U	380 U	380 U	390 U	360 U	370 U	400 U
ACENAPHTHENE	43000[2]	400 U	380 U	380 U	400 U	47 J	370 U	410 U
ACENAPHTHYLENE	5600	390 U	380 U	380 U	390 U	79 J	40 J	400 U
ANTHRACENE	35000[2]	390 U	380 U	67 J	82 J	120 J	66 J	400 U
BENZALDEHYDE	610000	390 U	380 U	380 U	390 U	360 U	370 U	400 U
BENZO(A)ANTHRACENE	620	87 J	66 J	210 J	280 J	1100	580	120 J
BENZO(A)PYRENE	62	82 J	67 J	200 J	270 J	1300 J	670	120 J
BENZO(B)FLUORANTHENE	620	110 J	92 J	270 J	330 J	2500 J	820	150 J
BENZO(G,H,I)PERYLENE	800[2]	48 J	46 J	74 J	160 J	510 J	520	85 J
BENZO(K)FLUORANTHENE	900[2]	44 J	58 J	110 J	140 J	1100 J	330 J	62 J
BIS(2-ETHYLHEXYL)PHTHALATE	35000	390 U	380 U	380 U	90 J	60 J	41 J	400 U
BUTYL BENZYL PHTHALATE	1200000	390 U	380 U	380 U	390 U	360 U	370 U	400 U
CARBAZOLE	24000	390 U	380 U	380 U	390 U	42 J	370 U	400 U
CHRYSENE	400[2]	79 J	69 J	220 J	310 J	1200	510	100 J
DIBENZO(A,H)ANTHRACENE	62	390 U	380 U	380 U	43 J	150 J	130 J	400 U
DIBENZOFURAN	29000	390 U	380 U	380 U	390 U	360 U	370 U	400 U
FLUORANTHENE	20000[2]	120 J	100 J	440	490	960	1000	220 J
FLUORENE	28000[2]	390 U	380 U	380 U	390 U	41 J	370 U	400 U
INDENO(1,2,3-CD)PYRENE	620	42 J	40 J	76 J	140 J	530 J	480	75 J
NAPHTHALENE	5600	390 U	380 U	380 U	390 U	360 U	370 U	400 U
PHENANTHRENE	40000[2]	390 U	380 U	240 J	360 J	460	210 J	400 U
PHENOL	3700000	390 U	380 U	380 U	390 U	360 U	370 U	400 U
PYRENE	13000[2]	110 J	100 J	420	480	2200	1100	240 J
TOTAL PAHs		722	638	2327	3085	12297	6456	1172

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB02	SWOS-S-SB02	SWOS-S-SB03	SWOS-S-SB03
	SAMPLE NUMBER	SWOS-S-SB01-0103	SWOS-S-SB01-0103-D	SWOS-S-SB01-0507	SWOS-S-SB02-0103	SWOS-S-SB02-0305	SWOS-S-SB03-0103	SWOS-S-SB03-0305
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	SAMPLE DEPTH (FT)	1-3	1-3	3-5	1-3	3-5	1-3	3-5
	QC IDENTIFIER	Field Dup.	Field Dup.					
	DUPLICATE		SWOS-S-SB01-0103					
PARAMETER	**PAL (1)**							
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)								
DIESEL RANGE ORGANICS	500(2)	41	26	28	40	95	41	50
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)								
GASOLINE RANGE ORGANICS		3.6 U	2.0 U	1.7 U	1.8 U	2.6 U	2.2 U	2.3 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)								
4,4'-DDD	2400	3.9 U	3.8 U	3.8 U	3.9 U	3.6 U	3.7 U	4 U
4,4'-DDE	1700	3.9 UJ	3.8 UJ	3.8 U	3.9 U	3.6 U	3.7 U	4 U
4,4'-DDT	1700	3.9 UJ	3.8 UJ	3.8 U	3.9 U	3.6 U	3.7 U	4 U
ALPHA-CHLORDANE		2 U	1.9 U	2 U	2 U	1.9 U	1.9 U	2.1 U
BETA-BHC	320	2 UJ	1.9 UJ	2 U	2 U	1.9 U	1.9 U	2.1 U
ENDOSULFAN SULFATE		3.9 UJ	3.8 UJ	3.8 U	3.9 U	R	3.7 U	4 U
ENDRIN	1800	3.9 UJ	3.8 UJ	3.8 U	3.9 U	3.6 U	3.7 U	4 U
ENDRIN ALDEHYDE		3.9 U	3.8 U	3.8 U	3.9 U	3.6 U	3.7 U	4 U
GAMMA-CHLORDANE		2 U	1.9 U	2 U	2 U	1.9 U	1.9 U	2.1 U
METHOXYCHLOR	31000	20 U	19 U	20 U	20 U	22 J	19 U	21 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)								
AROCLOR-1260		39 UJ	38 UJ	38 U	39 U	36 U	37 U	40 U
METALS BY METHOD 6010B (MG/KG)								
ALUMINUM	7600	13900	13100	7780	10300	8630	10800	13200
ANTIMONY	3.1	0.085 UJ	0.24 UJ	0.29 UJ	0.68 UJ	0.44 UJ	0.35 UJ	0.056 UJ
ARSENIC	0.39	7.8 J	8.0 J	3.7 J	7.1 J	7.4 J	6.8 J	4.7 J
BARIUM	540	24.5 J	25.4 J	17.2 J	25.8 J	36.8 J	55.1 J	34.1 J
BERYLLIUM	0.4 (2)	0.36 J	0.34 J	0.37 J	0.31 J	0.28 J	0.34 J	0.35 J
CADMIUM	3.7	0.0056 UJ	0.049 UJ	0.038 UJ	0.063 UJ	1.4 J	0.22 J	0.0055 UJ
CALCIUM		1500	1450	938	1080	20800	1460	1460
CHROMIUM	30	12.3 J	11.4 J	11.1	64.7	9.9	11.6 J	12.2 J
COBALT	900	13.0 J	14.9 J	26.2	9.3 J	46.9	10.0 J	6.1 J
COPPER	310	32.3	31.2	22.3	32.6	24.4	40.1	21.0
IRON	2300 (2)	32000	40500	21600	23300	17600	27300	24800
LEAD	150	43.5 J	36.6 J	53.0 J	74.0	151	361	42.7 J
MAGNESIUM		3310	3030	2150	1990	2560	2890	2350
MANGANESE	180	648	689	442	297	193	377	143
NICKEL	160	18.5 J	16.8 J	11.1 J	13.9 J	10.1 J	14.5 J	11.8 J
POTASSIUM		275	279	339	322	391	388	461
SELENIUM	39	4.6 J	4.2 J	3.2 J	3.5 J	2.2 J	3.9 J	3.5 J
SODIUM		41.4	39.7	57.7	55.7	146	49.6	64.8
THALLIUM	0.52	3.4 J	3.3 J	2.5 J	3.5 J	2.7 J	3.0 J	3.6 J
VANADIUM	55	19.3 J	19.4 J	12.8 J	20.1 J	13.6 J	16.4 J	20.5 J
ZINC	2300	63.2 J	61.1 J	51.3 J	69.4	427	239	255
METALS BY METHOD 7471A (MG/KG)								
MERCURY	2.3	0.033	0.34	0.033	0.76	0.12	0.17	0.056

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB04	SWOS-S-SB04	SWOS-S-SB05	SWOS-S-SB05	SWOS-S-SB06	SWOS-S-SB06	SWOS-S-SB07
	SAMPLE NUMBER	SWOS-S-SB04-0103	SWOS-S-SB04-0507	SWOS-S-SB05-0103	SWOS-S-SB05-0305	SWOS-S-SB06-0103	SWOS-S-SB06-0507	SWOS-S-SB07-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	SAMPLE DEPTH (FT)	1-3	3-5	1-3	3-5	1-3	5-7	1-3
	QC IDENTIFIER							Field Dup.
	DUPLICATE							
PARAMETER	**PAL (1)**							
VOLATILES BY METHOD 8260B (UG/KG)								
BENZENE	600	4 U	5 U	4 U	6 U	4 U	5 U	4 U
CARBON DISULFIDE	36000	4 U	5 U	4 U	6 U	4 U	2 J	4 U
CHLOROFORM	360	4 U	5 U	4 U	6 U	4 U	5 U	4 U
ISOPROPYLBENZENE	57000	4 U	5 U	4 U	6 U	4 U	5 U	4 U
METHYL CYCLOHEXANE	260000	4 U	5 U	4 U	6 U	4 U	5 U	4 U
METHYLENE CHLORIDE	9100	6	10	6	14	8	11	7 J
STYRENE	13000(2)	4 U	5 U	4 U	6 U	4 U	5 U	4 U
TOLUENE	52000	4 U	5 U	4 U	6 U	4 U	5 U	4 U
TRICHLOROFLUOROMETHANE	39000	4 U	5 U	4 U	6 U	4 U	5 U	4 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)								
1,1-BIPHENYL		370 U	400 U	380 U	420 U	340 U	400 U	360 U
2,4-DIMETHYLPHENOL	120000	370 U	400 U	380 U	76 J	340 U	400 U	360 U
2-METHYLNAPHTHALENE		370 U	400 U	380 U	44 J	340 U	400 U	360 U
4-METHYLPHENOL	31000	370 U	400 U	380 U	120 J	340 U	400 U	360 U
ACENAPHTHENE	43000(2)	370 U	410 U	380 U	420 U	340 U	400 U	360 U
ACENAPHTHYLENE	5600	370 U	400 U	380 U	880	340 U	400 U	110 J
ANTHRACENE	35000(2)	370 U	400 U	380 U	500	340 U	70 J	360 U
BENZALDEHYDE	610000	370 U	400 U	380 U	300 J	340 U	400 U	360 U
BENZO(A)ANTHRACENE	620	89 J	400 U	79 J	3800 J	78 J	180 J	110 J
BENZO(A)PYRENE	62	77 J	400 U	78 J	4500 J	76 J	170 J	150 J
BENZO(B)FLUORANTHENE	620	90 J	400 U	110 J	6100 J	98 J	220 J	240 J
BENZO(G,H,I)PERYLENE	800(2)	53 J	400 U	49 J	1200 J	340 U	90 J	360 UJ
BENZO(K)FLUORANTHENE	900(2)	58 J	400 U	40 J	2800 J	48 J	110 J	130 J
BIS(2-ETHYLHEXYL)PHTHALATE	35000	370 U	140 J	380 U	94 J	340 U	53 J	120 J
BUTYL BENZYL PHTHALATE	1200000	370 U	400 U	380 U	420 UJ	340 U	400 U	360 UJ
CARBAZOLE	24000	370 U	400 U	380 U	99 J	340 U	400 U	360 U
CHRYSENE	400(2)	78 J	400 U	84 J	3800 J	78 J	190 J	140 J
DIBENZO(A,H)ANTHRACENE	62	370 U	400 U	380 U	400 J	340 U	400 U	360 UJ
DIBENZOFURAN	29000	370 U	400 U	380 U	420 U	340 U	400 U	360 U
FLUORANTHENE	20000(2)	140 J	400 U	170 J	3700	110 J	390 J	160 J
FLUORENE	28000(2)	370 U	400 U	380 U	99 J	340 U	400 U	41 J
INDENO(1,2,3-CD)PYRENE	620	40 J	400 U	46 J	1300 J	43 J	89 J	360 UJ
NAPHTHALENE	5600	370 U	400 U	380 U	79 J	340 U	400 U	360 U
PHENANTHRENE	40000(2)	67 J	400 U	62 J	570	340 U	180 J	140 J
PHENOL	3700000	370 U	400 U	380 U	50 J	340 U	400 U	360 U
PYRENE	13000(2)	140 J	41 J	130 J	7800	110 J	280 J	390
TOTAL PAHs		832	41	848	37572	641	1969	1611

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB04	SWOS-S-SB04	SWOS-S-SB05	SWOS-S-SB05	SWOS-S-SB06	SWOS-S-SB06	SWOS-S-SB07
	SAMPLE NUMBER	SWOS-S-SB04-0103	SWOS-S-SB04-0507	SWOS-S-SB05-0103	SWOS-S-SB05-0305	SWOS-S-SB06-0103	SWOS-S-SB06-0507	SWOS-S-SB07-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	SAMPLE DEPTH (FT)	1-3	3-5	1-3	3-5	1-3	5-7	1-3
	QC IDENTIFIER							Field Dup.
	DUPLICATE							
PARAMETER	**PAL [1]**							
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)								
DIESEL RANGE ORGANICS	500[2]	20	19	29	1100	13 U	400	320
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)								
GASOLINE RANGE ORGANICS		2.6 U	1.7 U	2.1 U	2.3 U	1.6 U	3.9 U	2.0 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)								
4,4'-DDD	2400	3.7 U	4 U	3.8 U	21 J	3.4 U	4 U	3.6 U
4,4'-DDE	1700	3.7 U	4 U	3.8 U	4.2 U	3.4 UJ	4 UJ	3.6 UJ
4,4'-DDT	1700	3.7 U	4 U	3.8 U	R	3.4 UJ	4 UJ	3.6 UJ
ALPHA-CHLORDANE		1.9 U	2.1 U	1.9 U	2.2 U	1.8 U	2 U	1.9 U
BETA-BHC	320	1.9 U	2.1 U	1.9 U	2.2 U	1.8 UJ	2 UJ	1.9 UJ
ENDOSULFAN SULFATE		3.7 U	4 U	3.8 U	36 J	3.4 UJ	4 UJ	3.6 UJ
ENDRIN	1800	3.7 U	4 U	3.8 U	4.2 U	3.4 UJ	4 UJ	3.6 UJ
ENDRIN ALDEHYDE		3.7 U	4 U	3.8 U	4.2 U	3.4 U	4 U	3.6 U
GAMMA-CHLORDANE		1.9 U	2.1 U	1.9 U	2.2 U	1.8 U	2 U	1.9 U
METHOXYCHLOR	31000	19 U	21 U	19 U	78 J	18 U	20 U	19 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)								
AROCLOR-1260		37 U	40 U	38 U	42 U	34 UJ	40 UJ	36 UJ
METALS BY METHOD 6010B (MG/KG)								
ALUMINUM	7600	8570	10800	9200	9360	3340	10500	12400
ANTIMONY	3.1	0.051 UJ	0.059 UJ	0.052 UJ	0.49 UJ	0.32 UJ	0.34 UJ	0.51 UJ
ARSENIC	0.39	4.9 J	3.2 J	6.5 J	5.5 J	3.0 J	5.4 J	5.3 J
BARIUM	540	18.0 J	24.4 J	14.8 J	37.1 J	15.4 J	17.3 J	20.5 J
BERYLLIUM	0.4 [2]	0.28 J	0.18 UJ	0.27 J	0.31 J	0.21 J	0.32 J	0.29 J
CADMIUM	3.7	0.0051 UJ	0.0058 UJ	0.0051 UJ	0.72 J	0.023 UJ	0.014 UJ	0.0050 UJ
CALCIUM		792	1320	979	7300	569	1340	2030
CHROMIUM	30	8.8 J	10.6 J	8.5 J	12.2 J	0.55 J	11.3 J	15.3 J
COBALT	900	7.6 J	4.4 J	8.4 J	8.7 J	1.7 J	9.7 J	16.3 J
COPPER	310	27.5	14.7	24.0	47.7	8.6	27.6	37.1
IRON	2300 [2]	22500	26100	22800	31200	7490	28800	39900
LEAD	150	17.5 J	12.8 J	21.3 J	596	10.3 J	33.8 J	33.7 J
MAGNESIUM		2040	1850	2040	3640	853	2790	3830
MANGANESE	180	346	127	286	341	185	286	582
NICKEL	160	11.4 J	9.1 J	13 J	15.0 J	1.1 J	15.4 J	21.9 J
POTASSIUM		273	421	337.0	327	742	325	476
SELENIUM	39	3.4 J	3.2 J	3.3 J	3.0 J	1.5 J	4.2 J	4.7 J
SODIUM		27.5	103	42.8	71.9	30.5	69.6	48.8
THALLIUM	0.52	2.5 J	2.2 J	2.9 J	2.5 J	2.6 J	2.5 J	3.0 J
VANADIUM	55	12.7 J	19.0 J	13.9 J	17.2 J	4.1 J	17.7 J	21.7 J
ZINC	2300	51.4 J	34.2 J	44.2 J	601	45.7	75.3	65.2 J
METALS BY METHOD 7471A (MG/KG)								
MERCURY	2.3	0.15	0.029	0.054	0.14	0.014	0.055	0.022

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB08	SWOS-S-SB08	SWOS-S-SB09	SWOS-S-SB09	SWOS-S-SB10
	SAMPLE NUMBER	SWOS-S-SB07-0103-D	SWOS-S-SB07-0305	SWOS-S-SB08-0103	SWOS-S-SB08-0507	SWOS-S-SB09-0103	SWOS-S-SB09-0709	SWOS-S-SB10-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/16/05	03/16/05	03/16/05
	SAMPLE DEPTH (FT)	1-3	3-5	1-3	5-7	1-3	7-9	1-3
	QC IDENTIFIER	Field Dup.						Field Dup.
	DUPLICATE	SWOS-S-SB07-0103						
PARAMETER	**PAL [1]**							
VOLATILES BY METHOD 8260B (UG/KG)								
BENZENE	600	5 U	5 U	5 U	6 U	4 U	4 U	5 U
CARBON DISULFIDE	36000	5 U	5 U	5 U	6 U	4 U	4 U	5 U
CHLOROFORM	360	5 U	5 U	5 U	6 U	4 U	4 U	5 U
ISOPROPYLBENZENE	57000	5 U	5 U	5 U	3 J	4 U	4 U	5 UJ
METHYL CYCLOHEXANE	260000	5 U	5 U	5 U	18	4 U	4 U	5 U
METHYLENE CHLORIDE	9100	13 J	7	5	6 U	9 U	12 U	12 U
STYRENE	13000[2]	5 U	5 U	5 U	6 U	4 U	4 U	5 UJ
TOLUENE	52000	5 U	5 U	5 U	6 U	4 U	4 U	5 U
TRICHLOROFLUOROMETHANE	39000	5 U	5 U	5 U	6 U	4 U	4 U	5 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)								
1,1-BIPHENYL		360 U	500 U	380 U	360 U	370 U	370 U	370 U
2,4-DIMETHYLPHENOL	120000	360 U	500 U	380 U	360 U	370 U	370 U	370 U
2-METHYLNAPHTHALENE		360 U	290 J	380 U	24000	370 U	370 U	370 U
4-METHYLPHENOL	31000	360 U	500 U	380 U	360 U	370 U	370 U	370 U
ACENAPHTHENE	43000[2]	360 U	500 U	380 U	360 U	370 U	370 U	370 U
ACENAPHTHYLENE	5600	74 J	81 J	56 J	360 U	370 U	370 U	370 U
ANTHRACENE	35000[2]	360 U	100 J	120 J	1600	370 U	370 U	92 J
BENZALDEHYDE	610000	360 U	500 U	380 U	360 U	370 U	370 U	370 U
BENZO(A)ANTHRACENE	620	83 J	520	610	92 J	43 J	370 U	320 J
BENZO(A)PYRENE	62	120 J	660	580	52 J	39 J	370 U	290 J
BENZO(B)FLUORANTHENE	620	200 J	810	920	89 J	53 J	370 U	460
BENZO(G,H,I)PERYLENE	800[2]	360 UJ	480 J	200 J	360 U	370 U	370 U	87 J
BENZO(K)FLUORANTHENE	900[2]	120 J	320 J	400	360 U	370 U	370 U	200 J
BIS(2-ETHYLHEXYL)PHTHALATE	35000	130 J	56 J	48 J	39 J	58 J	59 J	70 J
BUTYL BENZYL PHTHALATE	1200000	360 U	500 U	380 U	360 U	370 U	370 U	370 U
CARBAZOLE	24000	360 U	500 U	380 U	360 U	370 U	370 U	48 J
CHRYSENE	400[2]	120 J	520	630	120 J	370 U	370 U	320 J
DIBENZO(A,H)ANTHRACENE	62	360 UJ	120 J	72 J	360 U	370 U	370 U	370 U
DIBENZOFURAN	29000	360 U	500 U	43 J	1100	370 U	370 U	370 U
FLUORANTHENE	20000[2]	120 J	680	1100	370	81 J	370 U	700
FLUORENE	28000[2]	360 U	500 U	380 U	360 U	370 U	370 U	51 J
INDENO(1,2,3-CD)PYRENE	620	360 UJ	420 J	220 J	360 U	370 U	370 U	99 J
NAPHTHALENE	5600	360 U	140 J	45 J	4000	370 U	370 U	370 U
PHENANTHRENE	40000[2]	80 J	120 J	500	3500	370 U	370 U	390
PHENOL	3700000	360 U	500 U	380 U	360 U	370 U	370 U	370 U
PYRENE	13000[2]	310 J	520	1100	420	76 J	370 U	610
TOTAL PAHs		1227	5781	6553	34243	292		3619

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB08	SWOS-S-SB08	SWOS-S-SB09	SWOS-S-SB09	SWOS-S-SB10
	SAMPLE NUMBER	SWOS-S-SB07-0103-D	SWOS-S-SB07-0305	SWOS-S-SB08-0103	SWOS-S-SB08-0507	SWOS-S-SB09-0103	SWOS-S-SB09-0709	SWOS-S-SB10-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/16/05	03/16/05	03/16/05
	SAMPLE DEPTH (FT)	1-3	3-5	1-3	5-7	1-3	7-9	1-3
	QC IDENTIFIER	Field Dup.						Field Dup.
	DUPLICATE	SWOS-S-SB07-0103						
PARAMETER	**PAL [1]**							
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)								
DIESEL RANGE ORGANICS	500[2]	480	1400	48	7200	20	15	35
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)								
GASOLINE RANGE ORGANICS		1.7 U	15	2.5 U	160	1.9 U	1.5 U	1.9 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)								
4,4'-DDD	2400	3.6 U	5 U	3.7 U	3.6 U	3.7 U	3.7 U	8.2
4,4'-DDE	1700	3.6 UJ	5 UJ	3.7 U	3.6 UJ	11	3.7 U	7.6
4,4'-DDT	1700	3.6 UJ	5 UJ	3.7 U	3.6 UJ	15	3.7 U	4.6
ALPHA-CHLORDANE		1.9 U	2.6 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
BETA-BHC	320	1.9 UJ	2.6 UJ	1.9 U	1.9 UJ	1.9 U	1.9 U	1.9 U
ENDOSULFAN SULFATE		3.6 UJ	5 UJ	8.8 J	3.6 UJ	3.7 U	3.7 U	3.7 U
ENDRIN	1800	3.6 UJ	5 UJ	3.7 U	3.6 UJ	3.7 U	3.7 U	3.7 U
ENDRIN ALDEHYDE		3.6 U	5 U	3.7 U	3.6 U	3.7 U	3.7 U	3.7 U
GAMMA-CHLORDANE		1.9 U	2.6 U	1.9 UJ	1.9 U	1.9 U	1.9 U	1.9 U
METHOXYCHLOR	31000	19 U	26 U	19 U	19 U	19 U	19 U	19 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)								
AROCLOR-1260		36 UJ	50 UJ	37 U	36 UJ	37 U	37 U	37 U
METALS BY METHOD 6010B (MG/KG)								
ALUMINUM	7600	11000	13000	13600	9620	8950 J	8200 J	9530 J
ANTIMONY	3.1	0.35 UJ	0.44 UJ	0.12 UJ	0.25 UJ	0.40 UJ	0.33 UJ	0.37 UJ
ARSENIC	0.39	4.2 J	9.7 J	7.8 J	5.8 J	6.6 J	5.8 J	5.3 J
BARIUM	540	17.1 J	146 J	23.4 J	50.6 J	21.1 J	22.6 J	22.8 J
BERYLLIUM	0.4 [2]	0.26 J	0.43 J	0.33 J	0.33 J	0.32 J	0.34 J	0.28 J
CADMIUM	3.7	0.0049 UJ	1.3 J	0.0053 UJ	0.0049 UJ	0.0056 UJ	0.0055 UJ	0.0054 UJ
CALCIUM		1830	3760	2020	1710	1600	748	1780
CHROMIUM	30	13.0 J	10.5 J	13.6 J	10.1 J	9.8 J	22.8	8.9 J
COBALT	900	12.7 J	8.1 J	12.4 J	8.0 J	9.7 J	13.0 J	7.0 J
COPPER	310	32.6	29.6	35.3	64.1	32.1 J	30.0 J	26.0 J
IRON	2300 [2]	31400	25000	48100	24200	28600	25900	26600
LEAD	150	30.3 J	1400	46.2 J	54.5 J	112 J	8.3 J	42.6 J
MAGNESIUM		3500	2820	3610	2790	2720 J	2520 J	2560 J
MANGANESE	180	477	389	433	371	332 J	331 J	295 J
NICKEL	160	19.0 J	17.7 J	19.2 J	12.8 J	15.1 J	16.0 J	11.9 J
POTASSIUM		426	367	312	333	444	474	344
SELENIUM	39	4.1 J	3.9 J	4.5 J	3.8 J	4.1 J	3.6 J	3.6 J
SODIUM		47.4	71.3	50.8	74.1	36.1	30.3	37.6
THALLIUM	0.52	2.7 J	3.7 J	R	2.4 J	3.1 J	2.5 J	2.6 J
VANADIUM	55	20.8 J	19.2 J	22.2 J	15.6 J	15.8 J	14.7 J	15.6 J
ZINC	2300	59.3 J	622	90.2 J	58.9 J	47.9	44.1	58.6
METALS BY METHOD 7471A (MG/KG)								
MERCURY	2.3	0.022	0.052	0.16	0.071	0.013 J	0.0073 U	0.082

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB11	SWOS-S-SB11	SWOS-S-SB12	SWOS-S-SB12	SWOS-S-SB13
	SAMPLE NUMBER	SWOS-S-SB10-0103-D	SWOS-S-SB10-0305	SWOS-S-SB11-0103	SWOS-S-SB11-0305	SWOS-S-SB12-0103	SWOS-S-SB12-0507	SWOS-S-SB13-0103
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	SAMPLE DEPTH (FT)	1-3	3-5	1-3	3-5	1-3	5-7	1-3
	QC IDENTIFIER	Field Dup.						
	DUPLICATE	SWOS-S-SB10-0103						
PARAMETER	**PAL [1]**							
VOLATILES BY METHOD 8260B (UG/KG)								
BENZENE	600	5 U	4 U	4 U	6 U	4 U	5 J	5 U
CARBON DISULFIDE	36000	5 U	4 U	4 U	6 U	4 U	4 U	5 U
CHLOROFORM	360	5 U	4 U	4 U	5 J	4 U	4 U	5 U
ISOPROPYLBENZENE	57000	5 U	4 U	4 U	6 U	4 U	270 J	5 U
METHYL CYCLOHEXANE	260000	5 U	4 U	4 U	6 U	4 U	4 U	5 U
METHYLENE CHLORIDE	9100	9 U	13 U	10 U	18 U	14 U	12 U	12 U
STYRENE	13000[2]	5 U	4 U	4 U	6 U	4 U	4 U	2 J
TOLUENE	52000	5 U	4 U	4 U	6 U	4 U	1 J	5 U
TRICHLOROFLUOROMETHANE	39000	5 U	4 U	4 U	6 U	4 U	4 U	5 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)								
1,1-BIPHENYL		380 U	350 U	360 U	370 U	380 U	370 U	360 U
2,4-DIMETHYLPHENOL	120000	380 U	350 U	360 U	370 U	380 U	370 U	360 U
2-METHYLNAPHTHALENE		380 U	350 U	360 U	370 U	41 J	31000	89 J
4-METHYLPHENOL	31000	380 U	350 U	360 U	370 U	380 U	370 U	360 U
ACENAPHTHENE	43000[2]	380 U	360 U	370 U	38 J	380 U	1900	360 U
ACENAPHTHYLENE	5600	380 U	350 U	360 U	370 U	380 U	370 U	360 U
ANTHRACENE	35000[2]	79 J	350 U	42 J	140 J	47 J	370 U	48 J
BENZALDEHYDE	610000	380 U	350 U	360 U	370 U	380 U	370 U	360 U
BENZO(A)ANTHRACENE	620	300 J	97 J	240 J	380	180 J	42 J	140 J
BENZO(A)PYRENE	62	290 J	90 J	230 J	320 J	210 J	370 U	140 J
BENZO(B)FLUORANTHENE	620	400	120 J	350 J	450	300 J	370 U	230 J
BENZO(G,H,I)PERYLENE	800[2]	130 J	39 J	80 J	120 J	87 J	370 U	41 J
BENZO(K)FLUORANTHENE	900[2]	180 J	56 J	140 J	190 J	140 J	370 U	84 J
BIS(2-ETHYLHEXYL)PHTHALATE	35000	44 J	47 J	53 J	59 J	66 J	53 J	61 J
BUTYL BENZYL PHTHALATE	1200000	380 U	350 U	360 U	370 U	380 U	370 U	360 U
CARBAZOLE	24000	48 J	350 U	360 U	64 J	380 U	370 U	360 U
CHRYSENE	400[2]	310 J	94 J	220 J	370 J	210 J	49 J	140 J
DIBENZO(A,H)ANTHRACENE	62	380 U	350 U	360 UJ	370 U	380 U	370 U	360 UJ
DIBENZOFURAN	29000	380 U	350 U	360 U	370 U	380 U	1500	360 U
FLUORANTHENE	20000[2]	680	210 J	400	890	380	190 J	220 J
FLUORENE	28000[2]	52 J	350 U	360 U	53 J	380 U	2300	360 U
INDENO(1,2,3-CD)PYRENE	620	120 J	40 J	79 J	130 J	88 J	370 U	43 J
NAPHTHALENE	5600	380 U	350 U	360 U	370 U	380 U	5800	42 J
PHENANTHRENE	40000[2]	480	120 J	170 J	740	210 J	4800	170 J
PHENOL	3700000	380 U	350 U	360 U	370 U	380 U	370 U	360 U
PYRENE	13000[2]	620	170 J	470 J	790	420	410	350 J
TOTAL PAHs		3641	1036	2421	4611	2313	46491	1737

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB11	SWOS-S-SB11	SWOS-S-SB12	SWOS-S-SB12	SWOS-S-SB13
	SAMPLE NUMBER	SWOS-S-SB10-0103-D	SWOS-S-SB10-0305	SWOS-S-SB11-0103	SWOS-S-SB11-0305	SWOS-S-SB12-0103	SWOS-S-SB12-0507	SWOS-S-SB13-0103
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	SAMPLE DEPTH (FT)	1-3	3-5	1-3	3-5	1-3	5-7	1-3
	QC IDENTIFIER	Field Dup.						
	DUPLICATE	SWOS-S-SB10-0103						
PARAMETER	**PAL (1)**							
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)								
DIESEL RANGE ORGANICS	500(2)	44	140	45	26	130	4500	110
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)								
GASOLINE RANGE ORGANICS		2.1 U	2.1 U	1.6 U	1.4 U	87 U	110	4.4 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)								
4,4'-DDD	2400	6.4	3.5 U	3.6 U	3.7 U	3.8 U	3.8 U	3.6 U
4,4'-DDE	1700	6.4	4.2 J	6	3.7 U	5.2	3.8 U	4.7
4,4'-DDT	1700	3.6 J	3.5 U	11 J	3.7 U	3.8 U	3.8 U	3.6 U
ALPHA-CHLORDANE		1.9 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U
BETA-BHC	320	4.2 J	1.8 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U
ENDOSULFAN SULFATE		3.8 U	3.5 U	3.6 U	3.7 U	3.8 U	3.8 U	3.6 U
ENDRIN	1800	3.8 U	3.5 U	3.6 U	3.7 U	3.8 U	3.8 U	3.6 U
ENDRIN ALDEHYDE		3.8 U	3.5 U	3.6 U	3.7 U	3.8 U	3.8 U	3.6 U
GAMMA-CHLORDANE		1.9 U	1.8 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U
METHOXYCHLOR	31000	19 U	18 U	19 U	19 U	20 U	19 U	19 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)								
AROCLOR-1260		38 U	35 U	36 U	37 U	38 U	38 U	36 U
METALS BY METHOD 6010B (MG/KG)								
ALUMINUM	7600	9930 J	8470 J	10900 J	12600 J	8010 J	7010 J	10400 J
ANTIMONY	3.1	0.27 UJ	0.11 UJ	0.053 UJ	0.15 UJ	0.27 UJ	0.058 UJ	0.15 UJ
ARSENIC	0.39	5.6 J	6.1 J	4.6 J	8.4 J	4.5 J	4.8 J	8.7 J
BARIUM	540	24.2 J	18.3 J	16.3 J	14.7 J	19.1 J	16.5 J	18.9 J
BERYLLIUM	0.4 (2)	0.29 J	0.25 J	0.30 J	0.30 J	0.28 J	0.27 J	0.31 J
CADMIUM	3.7	0.0054 UJ	0.0052 UJ	0.0052 UJ	0.038 UJ	0.046 UJ	0.0057 UJ	0.0080 UJ
CALCIUM		1630	1080	1240	1020	2040	836	1760
CHROMIUM	30	10.3 J	9.6 J	11.0 J	13.4 J	8.2 J	7.3 J	11.6 J
COBALT	900	7.1 J	9.4 J	10.7 J	10.7 J	7.0 J	8.4 J	9.8 J
COPPER	310	26.5 J	24.2 J	27.7 J	34.3 J	24.3 J	20.6 J	32.2 J
IRON	2300 (2)	25300	27600	31900	38500	21500	21500	31500
LEAD	150	45.7 J	17.5 J	34.1 J	33.6 J	42.4 J	5.9 J	44.2 J
MAGNESIUM		2400 J	2350 J	3010 J	3090 J	2120 J	1930 J	3180 J
MANGANESE	180	285 J	321 J	466 J	257 J	245 J	289 J	320 J
NICKEL	160	14.6 J	13.6 J	13.8 J	16.1 J	11.7 J	12.2 J	17.2 J
POTASSIUM		338	448	508	313	309	408	400
SELENIUM	39	2.7 J	3.7 J	4.1 J	4.5 J	3.0 J	3.1 J	3.8 J
SODIUM		43.4	24.6	33.4	31.1	41.6	41.7	54
THALLIUM	0.52	2.9 J	2.5 J	2.9 J	R	2.2 J	2.8 J	2.5 J
VANADIUM	55	16.2 J	15.8 J	14.6 J	15.5 J	13.4 J	12.9 J	15.8 J
ZINC	2300	59.9	44.1	52.0	87.3	57.0	31.2	77.8
METALS BY METHOD 7471A (MG/KG)								
MERCURY	2.3	0.074	0.074	0.017	0.020	0.061	0.0065 U	0.042

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB13	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15
	SAMPLE NUMBER	SWOS-S-SB13-0507	SWOS-S-SB14-0001	SWOS-S-SB14-0102	SWOS-S-SB14-0204	SWOS-S-SB15-0001	SWOS-S-SB15-0001-D	SWOS-S-SB15-0102
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	SAMPLE DEPTH (FT)	5-7	0-1	1-2	2-4	0-1	0-1	1-2
	QC IDENTIFIER					Field Dup.	Field Dup.	
	DUPLICATE						SWOS-S-SB15-0001	
PARAMETER	**PAL [1]**							
VOLATILES BY METHOD 8260B (UG/KG)								
BENZENE	600	1 J	5 U	5 U	6 U	5 U	3 U	7 U
CARBON DISULFIDE	36000	5 U	5 U	5 U	6 U	5 U	3 U	7 U
CHLOROFORM	360	5 U	5 U	5 U	6 U	5 U	3 U	7 U
ISOPROPYLBENZENE	57000	210 J	5 U	5 U	6 U	5 U	3 U	7 U
METHYL CYCLOHEXANE	260000	5 U	5 U	5 U	6 U	5 U	3 U	7 U
METHYLENE CHLORIDE	9100	12 U	16 U	12 U	17 U	15 U	10 U	27 U
STYRENE	13000[2]	5 U	5 U	5 U	6 U	5 U	3 U	7 U
TOLUENE	52000	5 U	5 U	5 U	6 U	5 U	3 U	7 U
TRICHLOROFLUOROMETHANE	39000	5 U	5 U	5 U	6 U	5 U	3 U	7 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)								
1,1-BIPHENYL		420 U	79 J	390 U	350 U	380 U	380 U	380 U
2,4-DIMETHYLPHENOL	120000	420 U	390 U	390 U	350 U	380 U	380 U	380 U
2-METHYLNAPHTHALENE		16000	510	390 U	350 U	380 U	380 U	380 U
4-METHYLPHENOL	31000	420 U	73 J	390 U	350 U	380 U	380 U	380 U
ACENAPHTHENE	43000[2]	1500	840	390 U	350 U	73 J	53 J	47 J
ACENAPHTHYLENE	5600	420 U	44 J	390 U	350 U	380 U	380 U	380 U
ANTHRACENE	35000[2]	420 U	1300	69 J	350 U	170 J	98 J	84 J
BENZALDEHYDE	610000	420 U	390 U	390 U	350 U	380 U	380 U	380 U
BENZO(A)ANTHRACENE	620	84 J	2300	310 J	350 U	460	280 J	300 J
BENZO(A)PYRENE	62	420 U	1700	240 J	350 U	410	270 J	230 J
BENZO(B)FLUORANTHENE	620	61 J	2500	320 J	350 U	630	390 J	340 J
BENZO(G,H,I)PERYLENE	800[2]	420 U	840	170 J	350 U	130 J	80 J	160 J
BENZO(K)FLUORANTHENE	900[2]	420 U	900	140 J	350 U	280 J	200 J	120 J
BIS(2-ETHYLHEXYL)PHTHALATE	35000	56 J	40 J	63 J	49 J	81 J	97 J	100 J
BUTYL BENZYL PHTHALATE	1200000	420 U	390 U	390 U	350 U	380 U	380 U	380 U
CARBAZOLE	24000	420 U	980 J	45 J	350 UJ	85 J	51 J	64 J
CHRYSENE	400[2]	110 J	2200	240 J	350 U	430	270 J	280 J
DIBENZO(A,H)ANTHRACENE	62	420 U	230 J	390 U	350 U	380 U	380 UJ	40 J
DIBENZOFURAN	29000	1300	540	390 U	350 U	51 J	380 U	380 U
FLUORANTHENE	20000[2]	300 J	5900	520	350 U	920 J	550 J	510
FLUORENE	28000[2]	2000	870	390 U	350 U	83 J	46 J	41 J
INDENO(1,2,3-CD)PYRENE	620	420 U	770	150 J	350 U	130 J	82 J	140 J
NAPHTHALENE	5600	3000	1600	390 U	350 U	65 J	380 U	380 U
PHENANTHRENE	40000[2]	3600	6200	320 J	350 U	700	430	400
PHENOL	3700000	420 U	48 J	390 U	350 U	380 U	380 U	380 U
PYRENE	13000[2]	530	5500	550	41 J	1000	720	580
TOTAL PAHs		27185	34204	3029	41	5481	3469	3272

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB13	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15
	SAMPLE NUMBER	SWOS-S-SB13-0507	SWOS-S-SB14-0001	SWOS-S-SB14-0102	SWOS-S-SB14-0204	SWOS-S-SB15-0001	SWOS-S-SB15-0001-D	SWOS-S-SB15-0102
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	SAMPLE DEPTH (FT)	5-7	0-1	1-2	2-4	0-1	0-1	1-2
	QC IDENTIFIER					Field Dup.	Field Dup.	
	DUPLICATE						SWOS-S-SB15-0001	
PARAMETER	**PAL [1]**							
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)								
DIESEL RANGE ORGANICS	500[2]	5000	140	56	97	66	52	290
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)								
GASOLINE RANGE ORGANICS		87	1.8 U	2.4 U	2.1 U	1.9 U	2.2 U	2.7 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)								
4,4'-DDD	2400	4.2 U	3.9 U	3.9 U	3.5 U	3.8 U	3.8 U	31 J
4,4'-DDE	1700	4.2 U	17	14	3.5 U	11	11	80
4,4'-DDT	1700	4.2 U	16	9.8	3.5 U	10 J	8.9	67
ALPHA-CHLORDANE		2.2 U	2 U	2 U	1.8 U	2 U	2 U	8.2 J
BETA-BHC	320	2.2 U	R	R	1.8 U	4 J	3.8 J	R
ENDOSULFAN SULFATE		4.2 U	R	3.9 U	3.5 U	3.8 U	3.8 U	7.6 UJ
ENDRIN	1800	4.2 U	3.9 U	3.9 U	3.5 U	3.8 U	3.8 U	9.8 J
ENDRIN ALDEHYDE		4.2 U	3.9 U	3.9 U	3.5 U	3.8 U	3.8 U	7.6 U
GAMMA-CHLORDANE		2.2 U	2 U	2 U	1.8 U	2 U	2 U	7.8 J
METHOXYCHLOR	31000	22 U	20 U	20 U	18 U	20 U	20 U	39 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)								
AROCLOR-1260		42 U	39 U	39 U	35 U	38 U	38 U	38 U
METALS BY METHOD 6010B (MG/KG)								
ALUMINUM	7600	7590 J	8320 J	10400 J	3590 J	10700 J	11400 J	9850 J
ANTIMONY	3.1	0.058 UJ	0.16 UJ	0.090 UJ	0.055 UJ	1.3 UJ	2.4 J	13.4 J
ARSENIC	0.39	3.3 J	5.3 J	8.2 J	2.4 J	9.3 J	10.1 J	9.7 J
BARIUM	540	21.4 J	23.6 J	21.0 J	8.1 J	25.8 J	27.3 J	70.5 J
BERYLLIUM	0.4 [2]	0.17 J	0.25 J	0.30 J	0.17 J	0.38 J	0.38 J	0.31 J
CADMIUM	3.7	0.64 J	0.026 UJ	0.036 UJ	0.0054 UJ	0.043 UJ	0.059 UJ	0.22 J
CALCIUM		745	2170	1780	725	2070	3050	2320
CHROMIUM	30	6.4	7.9	11.6 J	3.3 J	15.1 J	13.7 J	14.4 J
COBALT	900	7.5 J	6.1 J	9.4 J	3.4 J	9.8 J	9.8 J	9.2 J
COPPER	310	13.5 J	24.2 J	28.5 J	11.1 J	36.0 J	35.0 J	37.5 J
IRON	2300 [2]	9340	14800	23800	8430	35700	33800	33300
LEAD	150	12.8 J	35.5 J	40.3 J	6.5 J	60.2 J	71.2 J	607 J
MAGNESIUM		1320 J	1870 J	2710 J	1280 J	2980 J	3320 J	2650 J
MANGANESE	180	133 J	239 J	306 J	152 J	347 J	366 J	310 J
NICKEL	160	6.6 J	10.2 J	15.6 J	5.2 J	16.8 J	16.5 J	15.6 J
POTASSIUM		259	421	375	334	536	533	294
SELENIUM	39	2.0 J	3.0 J	3.4 J	1.3 J	4.0 J	3.9 J	3.3 J
SODIUM		63.2	43.5	49.5	27.4	46.7	50.5	44.1
THALLIUM	0.52	2.7 J	2.8 J	2.9 J	1.6 J	3.2 J	2.9 J	2.7 J
VANADIUM	55	13.0 J	15.1 J	16.7 J	5.7 J	18.7 J	19.1 J	20.4 J
ZINC	2300	75.4	52.3	64.6	21.9	88.6	83.6	220
METALS BY METHOD 7471A (MG/KG)								
MERCURY	2.3	0.12	0.054	0.076	0.0065 U	0.061	0.050	0.12

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB15	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB17	SWOS-S-SB17	SWOS-S-SB17
	SAMPLE NUMBER	SWOS-S-SB15-0204	SWOS-S-SB16-0001	SWOS-S-SB16-0102	SWOS-S-SB16-0406	SWOS-S-SB17-0001	SWOS-S-SB17-0102	SWOS-S-SB17-0102-D
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/17/05	03/17/05	03/17/05
	SAMPLE DEPTH (FT)	2-4	0-1	1-2	4-6	0-1	1-2	1-2
	QC IDENTIFIER						Field Dup.	Field Dup.
	DUPLICATE							SWOS-S-SB17-0102
PARAMETER	**PAL [1]**							
VOLATILES BY METHOD 8260B (UG/KG)								
BENZENE	600	7 U	4 U	5 U	3 U	5 U	5 U	5 U
CARBON DISULFIDE	36000	7 U	4 U	5 U	3 U	5 U	5 U	5 U
CHLOROFORM	360	7 U	4 U	5 U	3 U	5 U	5 U	5 U
ISOPROPYLBENZENE	57000	7 U	4 U	5 U	3 U	5 U	5 U	5 U
METHYL CYCLOHEXANE	260000	7 U	4 U	5 U	3 U	5 U	5 U	5 U
METHYLENE CHLORIDE	9100	19 U	14 U	16 U	8 U	9 U	11 U	14 U
STYRENE	13000[2]	7 U	4 U	5 U	3 U	5 U	5 U	5 U
TOLUENE	52000	7 U	4 U	5 U	3 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	39000	7 U	4 U	5 U	3 U	5 U	5 U	5 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)								
1,1-BIPHENYL		2100 U	350 U	460 U	370 U	420 U	380 U	380 U
2,4-DIMETHYLPHENOL	120000	2100 U	350 U	460 U	370 U	420 UJ	380 U	380 U
2-METHYLNAPHTHALENE		2100 U	350 U	460 U	93 J	420 U	380 U	380 U
4-METHYLPHENOL	31000	2100 U	350 U	460 U	370 U	420 U	380 U	380 U
ACENAPHTHENE	43000[2]	2200 U	350 U	460 U	390	45 J	380 U	380 U
ACENAPHTHYLENE	5600	2100 U	350 U	460 U	160 J	420 U	380 U	380 U
ANTHRACENE	35000[2]	2100 U	110 J	82 J	1800	85 J	68 J	380 UJ
BENZALDEHYDE	610000	2100 U	350 U	460 U	370 U	420 U	380 U	380 U
BENZO(A)ANTHRACENE	620	680 J	380 J	230 J	2800	330 J	230 J	160 J
BENZO(A)PYRENE	62	540 J	300 J	180 J	2000	270 J	220 J	150 J
BENZO(B)FLUORANTHENE	620	810 J	400 J	240 J	2600	430 J	300 J	220 J
BENZO(G,H,I)PERYLENE	800[2]	2100 UJ	200 J	120 J	920	150 J	380 UJ	380 UJ
BENZO(K)FLUORANTHENE	900[2]	260 J	190 J	99 J	990	140 J	130 J	88 J
BIS(2-ETHYLHEXYL)PHTHALATE	35000	2100 UJ	41 J	62 J	74 J	85 J	70 J	60 J
BUTYL BENZYL PHTHALATE	1200000	410 J	350 UJ	460 U	370 U	420 U	380 U	380 U
CARBAZOLE	24000	2100 UJ	61 J	52 J	430	84 J	42 J	380 U
CHRYSENE	400[2]	680 J	360 J	210 J	2000	280 J	250 J	130 J
DIBENZO(A,H)ANTHRACENE	62	2100 UJ	350 UJ	460 U	250 J	420 UJ	380 UJ	380 UJ
DIBENZOFURAN	29000	2100 U	350 U	460 U	310 J	420 U	380 U	380 U
FLUORANTHENE	20000[2]	940 J	600	410 J	6600	580	440	230 J
FLUORENE	28000[2]	2100 U	37 J	460 U	600	43 J	380 U	380 U
INDENO(1,2,3-CD)PYRENE	620	360 J	170 J	100 J	820	140 J	110 J	90 J
NAPHTHALENE	5600	2100 U	350 U	66 J	370 U	420 U	380 U	380 U
PHENANTHRENE	40000[2]	660 J	400	350 J	6200	410 J	290 J	120 J
PHENOL	3700000	2100 U	350 U	460 U	370 U	420 U	380 U	380 U
PYRENE	13000[2]	1200 J	700 J	390 J	5400	650	550	310 J
TOTAL PAHs		6130	3847	2477	33623	3553	2588	1498

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB15	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB17	SWOS-S-SB17	SWOS-S-SB17
	SAMPLE NUMBER	SWOS-S-SB15-0204	SWOS-S-SB16-0001	SWOS-S-SB16-0102	SWOS-S-SB16-0406	SWOS-S-SB17-0001	SWOS-S-SB17-0102	SWOS-S-SB17-0102-D
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/17/05	03/17/05	03/17/05
	SAMPLE DEPTH (FT)	2-4	0-1	1-2	4-6	0-1	1-2	1-2
	QC IDENTIFIER						Field Dup.	Field Dup.
	DUPLICATE							SWOS-S-SB17-0102
PARAMETER	**PAL [1]**							
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)								
DIESEL RANGE ORGANICS	500[2]	550	55	47	85	68	110	150
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)								
GASOLINE RANGE ORGANICS		4.0 U	2.0 U	2.1 U	2	2.4	2.2	1.5
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)								
4,4'-DDD	2400	49 J	3.5 U	4.6 U	3.7 U	4.2 U	3.7 U	3.7 U
4,4'-DDE	1700	37	7.6	4.6 U	3.7 U	41	5.5	5.5
4,4'-DDT	1700	15	9 J	4.6 U	3.7 U	46	7	6.9
ALPHA-CHLORDANE		7.4 J	1.8 U	2.4 U	1.9 U	3 J	1.9 U	1.9 U
BETA-BHC	320	2.2 U	5.1 J	4.7 J	1.9 U	2.2 U	1.9 U	1.9 U
ENDOSULFAN SULFATE		4.3 UJ	3.5 UJ	4.6 UJ	3.7 UJ	4.2 UJ	3.7 UJ	3.7 UJ
ENDRIN	1800	4.3 U	3.5 U	4.6 U	3.7 U	4.2 U	3.7 U	3.7 U
ENDRIN ALDEHYDE		5.3 J	3.5 U	4.6 U	3.7 U	4.2 U	3.7 U	3.7 U
GAMMA-CHLORDANE		10	1.8 U	2.4 U	1.9 U	2.2 U	1.9 U	1.9 U
METHOXYCHLOR	31000	22 U	18 U	24 U	19 U	22 U	19 U	19 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)								
AROCLOR-1260		43 U	63	46 U	37 U	42 U	37 U	37 U
METALS BY METHOD 6010B (MG/KG)								
ALUMINUM	7600	8230 J	7840 J	11600 J	11500	8340	7650	12400
ANTIMONY	3.1	105 J	0.21 UJ	0.065 UJ	0.057 UJ	0.26 UJ	0.23 UJ	0.22 UJ
ARSENIC	0.39	6.9 J	4.0 J	6.7 J	4.7 J	8.2 J	4.6 J	7.6 J
BARIUM	540	82.1 J	25.1 J	21.4 J	21.7 J	18.8 J	16.5 J	30.1 J
BERYLLIUM	0.4 [2]	0.25 J	0.42 J	0.34 J	0.31	0.24	0.27	0.43
CADMIUM	3.7	0.82 J	0.012 UJ	0.0064 UJ	0.0056 UJ	0.016 UJ	0.0052 UJ	0.017 UJ
CALCIUM		2510	1260	1560	1610	1360	1140	1790
CHROMIUM	30	14.7	6.0 J	12.1 J	13.6 J	10.0	9.6 J	14.9 J
COBALT	900	7.8 J	6.4 J	10.6 J	7.5 J	4.6 J	7.9 J	13.4 J
COPPER	310	50.6 J	18.5 J	34.6 J	55.8 J	28.5 J	26.8 J	45.5 J
IRON	2300 [2]	16600	13100	40100	27500 J	15600 J	34400 J	42400 J
LEAD	150	1010 J	29.6 J	28.2 J	27.2 J	37.7 J	41.9 J	59.6 J
MAGNESIUM		2030 J	1790 J	3080 J	3180 J	1480 J	2320 J	3540 J
MANGANESE	180	193 J	261 J	450 J	245 J	187 J	272 J	467 J
NICKEL	160	14.6 J	8.2 J	17.0 J	14.9 J	8.1 J	13.0 J	21.9 J
POTASSIUM		273	522	400	354 J	289 J	291 J	619 J
SELENIUM	39	3.4 J	2.4 J	4.3 J	3.4 J	3.0 J	3.3 J	4.4 J
SODIUM		45.8	51.0	51.3	29.9	46.9	30.9	53.9
THALLIUM	0.52	2.5 J	3.0 J	3.4 J	2.7 J	3.2 J	R	3.5 J
VANADIUM	55	25.4 J	13.2 J	17.1 J	18.1 J	16.7 J	14.0 J	23.7 J
ZINC	2300	439	45.3	60.9	63.8 J	54.2 J	66.2 J	121 J
METALS BY METHOD 7471A (MG/KG)								
MERCURY	2.3	0.25	0.042	0.070	0.057	0.065	0.034	0.035

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB17	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB19	SWOS-S-SB19	SWOS-S-SB19
	SAMPLE NUMBER	SWOS-S-SB17-0406	SWOS-S-SB18-0001	SWOS-S-SB18-0102	SWOS-S-SB18-0406	SWOS-S-SB19-0001	SWOS-S-SB19-0102	SWOS-S-SB19-0608
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05
	SAMPLE DEPTH (FT)	4-6	0-1	1-2	4-6	0-1	1-2	6-8
	QC IDENTIFIER							
	DUPLICATE							
PARAMETER	**PAL [1]**							
VOLATILES BY METHOD 8260B (UG/KG)								
BENZENE	600	4 U	5 U	4 U	4 U	5 U	5 U	4 U
CARBON DISULFIDE	36000	4 U	5 U	4 U	4 U	5 U	5 U	4 U
CHLOROFORM	360	4 U	5 U	4 U	4 U	5 U	5 U	4 U
ISOPROPYLBENZENE	57000	4 U	5 U	4 U	18 J	5 U	5 U	4 U
METHYL CYCLOHEXANE	260000	4 U	5 U	4 U	30 J	5 U	5 U	4 U
METHYLENE CHLORIDE	9100	13 U	12 U	4 U	10 U	8 U	13 U	10 U
STYRENE	13000[2]	4 U	5 U	4 U	4 U	5 U	5 U	4 U
TOLUENE	52000	4 U	5 U	4 U	4 U	5 U	5 U	4 U
TRICHLOROFLUOROMETHANE	39000	1 J	5 U	4 U	4 U	1 J	5 U	4 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)								
1,1-BIPHENYL		370 U	400 U	390 U	380 U	380 U	360 U	370 U
2,4-DIMETHYLPHENOL	120000	370 U	400 U	390 U	380 U	380 U	360 U	370 U
2-METHYLNAPHTHALENE		370 U	400 U	390 U	380 U	380 U	360 U	370 U
4-METHYLPHENOL	31000	370 U	400 U	390 U	380 U	380 U	360 U	370 U
ACENAPHTHENE	43000[2]	370 U	400 U	390 U	390 U	380 U	370 U	380 U
ACENAPHTHYLENE	5600	370 U	400 U	390 U	380 U	380 U	360 U	370 U
ANTHRACENE	35000[2]	370 U	74 J	390 U	1000 J	44 J	360 U	370 U
BENZALDEHYDE	610000	370 U	400 U	390 U	380 U	380 U	360 U	370 U
BENZO(A)ANTHRACENE	620	370 U	250 J	110 J	380 U	270 J	160 J	370 U
BENZO(A)PYRENE	62	370 U	200 J	100 J	380 U	250 J	240 J	370 U
BENZO(B)FLUORANTHENE	620	370 U	300 J	130 J	380 U	320 J	290 J	370 U
BENZO(G,H,I)PERYLENE	800[2]	370 U	120 J	71 J	380 U	380 UJ	190 J	370 U
BENZO(K)FLUORANTHENE	900[2]	370 U	110 J	50 J	380 U	140 J	120 J	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	60 J	51 J	54 J	380 U	63 J	66 J	65 J
BUTYL BENZYL PHTHALATE	1200000	370 U	400 U	390 U	380 U	380 U	360 U	370 U
CARBAZOLE	24000	370 U	400 U	390 U	380 U	380 U	360 U	370 U
CHRYSENE	400[2]	370 U	220 J	94 J	380 U	240 J	130 J	370 U
DIBENZO(A,H)ANTHRACENE	62	370 U	400 U	390 U	380 U	380 UJ	360 U	370 U
DIBENZOFURAN	29000	370 U	400 U	390 U	380 U	380 U	360 U	370 U
FLUORANTHENE	20000[2]	64 J	440	160 J	84 J	420	300 J	370 U
FLUORENE	28000[2]	370 U	400 U	390 U	1700 J	380 U	360 U	370 U
INDENO(1,2,3-CD)PYRENE	620	370 U	100 J	390 U	380 U	380 UJ	150 J	370 U
NAPHTHALENE	5600	370 U	400 U	390 U	380 U	380 U	360 U	370 U
PHENANTHRENE	40000[2]	370 U	280 J	78 J	2500 J	200 J	56 J	370 U
PHENOL	3700000	370 U	400 U	390 U	380 U	380 U	360 U	370 U
PYRENE	13000[2]	55 J	410	190 J	680	620	350 J	370 U
TOTAL PAHs		119	2504	983	5964	2504	1986	

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB17	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB19	SWOS-S-SB19	SWOS-S-SB19
	SAMPLE NUMBER	SWOS-S-SB17-0406	SWOS-S-SB18-0001	SWOS-S-SB18-0102	SWOS-S-SB18-0406	SWOS-S-SB19-0001	SWOS-S-SB19-0102	SWOS-S-SB19-0608
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05
	SAMPLE DEPTH (FT)	4-6	0-1	1-2	4-6	0-1	1-2	6-8
	QC IDENTIFIER							
	DUPLICATE							
PARAMETER	**PAL (1)**							
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)								
DIESEL RANGE ORGANICS	500(2)	21	94	74	3900	55	51	28
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)								
GASOLINE RANGE ORGANICS		1.9	1.9	1.4 U	110	2.4	1.5	2.1 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)								
4,4'-DDD	2400	3.7 U	4 U	39 U	3.8 U	3.8 U	3.7 U	3.8 U
4,4'-DDE	1700	3.7 U	25	290	3.8 U	23	4.8	3.8 U
4,4'-DDT	1700	3.7 U	23	250	3.8 U	24	5.9	3.8 U
ALPHA-CHLORDANE		1.9 U	2.1 U	20 U	2 U	2 U	1.9 U	1.9 U
BETA-BHC	320	1.9 U	2.1 U	20 U	5.4 J	4.8 J	1.9 U	1.9 U
ENDOSULFAN SULFATE		3.7 UJ	4 U	39 U	3.8 U	3.8 U	3.7 U	3.8 U
ENDRIN	1800	3.7 U	4 U	39 U	3.8 U	3.8 U	3.7 U	3.8 U
ENDRIN ALDEHYDE		3.7 U	4 U	39 U	3.8 U	3.8 U	3.7 U	3.8 U
GAMMA-CHLORDANE		1.9 U	2.1 U	20 U	2 U	2 U	1.9 U	1.9 U
METHOXYCHLOR	31000	19 U	21 U	200 U	20 U	20 U	19 U	19 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)								
AROCLOR-1260		37 U	40 U	39 U	38 U	38 U	37 U	38 U
METALS BY METHOD 6010B (MG/KG)								
ALUMINUM	7600	9080	11000	11600	18600	9680	11300	9570
ANTIMONY	3.1	0.54 UJ	0.060 UJ	0.49 UJ	0.14 UJ	0.19 UJ	0.26 UJ	0.26 UJ
ARSENIC	0.39	6.3 J	6.5 J	8.4 J	7.0 J	6.0 J	10.0 J	8.1 J
BARIUM	540	18.3 J	28.7 J	28.7 J	7.9 J	24.3 J	22.6 J	15.2 J
BERYLLIUM	0.4 (2)	0.36	0.32	0.48	0.42	0.27	0.36	0.39
CADMIUM	3.7	0.0057 UJ	0.015 UJ	0.0058 UJ	0.0056 UJ	0.034 UJ	0.0053 UJ	0.0053 UJ
CALCIUM		991	1790	1620	2300	1520	1480	1230
CHROMIUM	30	28.0	10.8 J	12.9 J	18.7 J	9.7 J	11.7 J	13.5 J
COBALT	900	8.9 J	7.4 J	10.9 J	17.1 J	7.0 J	12.0 J	14.7 J
COPPER	310	30.2 J	32.5 J	41.1 J	44.4 J	32.0 J	37.1 J	40.0 J
IRON	2300 (2)	25600 J	25200 J	36200 J	58500 J	26600 J	35800 J	43600 J
LEAD	150	76.5 J	44.1 J	71.1 J	13.1 J	41.5 J	25.7 J	12.0 J
MAGNESIUM		2430 J	2150 J	2810 J	5910 J	2180 J	3480 J	3120 J
MANGANESE	180	336 J	280 J	410 J	348 J	345 J	433 J	435 J
NICKEL	160	14.4 J	12.1 J	18.1 J	27.8 J	11.3 J	18.2 J	23.7 J
POTASSIUM		379 J	436 J	329 J	308 J	401 J	546 J	510 J
SELENIUM	39	3.7 J	3.2 J	5.3 J	5.0 J	2.8 J	3.8 J	4.8 J
SODIUM		45.9	53.7	52.8	28.5	47.5	60.9	55.8
THALLIUM	0.52	3.0 J	3.7 J	3.2 J	R	3.5 J	3.1 J	R
VANADIUM	55	15.6 J	19.4 J	22.4 J	25.8 J	17.7 J	19.3 J	16.2 J
ZINC	2300	48.7 J	82.2 J	79.1 J	83.3 J	60.6 J	80.6 J	54.8 J
METALS BY METHOD 7471A (MG/KG)								
MERCURY	2.3	0.015	0.060	0.045	0.0074 U	0.051	0.027	0.0081 J

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB20	SWOS-S-SB20	SWOS-S-SB20
	SAMPLE NUMBER	SWOS-S-SB20-0001	SWOS-S-SB20-0102	SWOS-S-SB20-0204
	SAMPLE DATE	03/17/05	03/17/05	03/17/05
	SAMPLE DEPTH (FT)	0-1	1-2	2-4
	QC IDENTIFIER			
	DUPLICATE			
PARAMETER	**PAL [1]**			
VOLATILES BY METHOD 8260B (UG/KG)				
BENZENE	600	4 U	5 U	4 U
CARBON DISULFIDE	36000	4 U	5 U	4 U
CHLOROFORM	360	4 U	5 U	4 U
ISOPROPYLBENZENE	57000	4 U	5 U	4 U
METHYL CYCLOHEXANE	260000	4 U	5 U	4 U
METHYLENE CHLORIDE	9100	9 U	13 U	9 U
STYRENE	13000[2]	4 U	5 U	4 U
TOLUENE	52000	4 U	5 U	4 U
TRICHLOROFLUOROMETHANE	39000	4 U	5 U	4 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)				
1,1-BIPHENYL		370 U	360 U	360 U
2,4-DIMETHYLPHENOL	120000	370 U	360 U	360 U
2-METHYLNAPHTHALENE		370 U	360 U	360 U
4-METHYLPHENOL	31000	370 U	360 U	360 U
ACENAPHTHENE	43000[2]	370 U	360 U	370 U
ACENAPHTHYLENE	5600	370 U	360 U	360 U
ANTHRACENE	35000[2]	59 J	360 UJ	360 U
BENZALDEHYDE	610000	370 U	360 U	360 U
BENZO(A)ANTHRACENE	620	190 J	80 J	360 U
BENZO(A)PYRENE	62	200 J	120 J	360 U
BENZO(B)FLUORANTHENE	620	300 J	190 J	360 U
BENZO(G,H,I)PERYLENE	800[2]	370 UJ	360 UJ	360 U
BENZO(K)FLUORANTHENE	900[2]	120 J	91 J	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	160 J	130 J	50 J
BUTYL BENZYL PHTHALATE	1200000	370 U	360 U	360 U
CARBAZOLE	24000	68 J	360 U	360 U
CHRYSENE	400[2]	250 J	120 J	360 U
DIBENZO(A,H)ANTHRACENE	62	370 UJ	360 UJ	360 U
DIBENZOFURAN	29000	370 U	360 U	360 U
FLUORANTHENE	20000[2]	420	170 J	360 U
FLUORENE	28000[2]	370 U	360 U	360 U
INDENO(1,2,3-CD)PYRENE	620	110 J	77 J	360 U
NAPHTHALENE	5600	370 U	360 U	360 U
PHENANTHRENE	40000[2]	350 J	82 J	360 U
PHENOL	3700000	370 U	360 U	360 U
PYRENE	13000[2]	550	260 J	360 U
TOTAL PAHs		2549	1190	

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-1

SUMMARY OF DETECTED ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB20	SWOS-S-SB20	SWOS-S-SB20
	SAMPLE NUMBER	SWOS-S-SB20-0001	SWOS-S-SB20-0102	SWOS-S-SB20-0204
	SAMPLE DATE	03/17/05	03/17/05	03/17/05
	SAMPLE DEPTH (FT)	0-1	1-2	2-4
	QC IDENTIFIER			
	DUPLICATE			
PARAMETER	**PAL (1)**			
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)				
DIESEL RANGE ORGANICS	500(2)	54	190	23
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)				
GASOLINE RANGE ORGANICS		1.4	1.9	1.3 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)				
4,4'-DDD	2400	3.7 U	3.6 U	3.7 U
4,4'-DDE	1700	21	3.6 U	3.7 U
4,4'-DDT	1700	14	3.6 U	3.7 U
ALPHA-CHLORDANE		1.9 U	1.9 U	1.9 U
BETA-BHC	320	1.9 U	1.9 U	1.9 U
ENDOSULFAN SULFATE		3.7 U	3.6 U	3.7 U
ENDRIN	1800	3.7 U	3.6 U	3.7 U
ENDRIN ALDEHYDE		3.7 U	3.6 U	3.7 U
GAMMA-CHLORDANE		1.9 U	1.9 U	1.9 U
METHOXYCHLOR	31000	19 U	19 U	19 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)				
AROCLOR-1260		37 U	36 U	37 U
METALS BY METHOD 6010B (MG/KG)				
ALUMINUM	7600	3230	9180	8120
ANTIMONY	3.1	0.052 UJ	0.054 UJ	0.12 UJ
ARSENIC	0.39	1.6 J	4.1 J	4.2 J
BARIUM	540	11.1 J	23.9 J	19.7 J
BERYLLIUM	0.4 (2)	0.23	0.31	0.24
CADMIUM	3.7	0.0051 UJ	0.0053 UJ	0.0054 UJ
CALCIUM		507	1050	660
CHROMIUM	30	1.1 J	11.8 J	11.1 J
COBALT	900	1.5 J	8.3 J	5.3 J
COPPER	310	5.7 J	27.5 J	17.3 J
IRON	2300 (2)	5640 J	24900 J	23200 J
LEAD	150	4.9 J	21.7 J	6.4 J
MAGNESIUM		465 J	2460 J	2190 J
MANGANESE	180	121 J	250 J	205 J
NICKEL	160	1.7 J	13.9 J	12.3 J
POTASSIUM		456 J	434 J	414 J
SELENIUM	39	0.90 UJ	3.7 J	2.6 J
SODIUM		33.8	93.3	95.6
THALLIUM	0.52	1.8 J	3.1 J	3.2 J
VANADIUM	55	3.9 J	18.1 J	16.2 J
ZINC	2300	20.8 J	50.9 J	29.4 J
METALS BY METHOD 7471A (MG/KG)				
MERCURY	2.3	0.0072 U	0.031	0.0070 U

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 4-2

COMPARISON OF METAL CONCENTRATIONS IN SURFACE SOIL SAMPLES TO SURFACE SOIL BACKGROUND METAL VALUES
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB02	SWOS-S-SB03	SWOS-S-SB04	SWOS-S-SB05	SWOS-S-SB06
	SAMPLE NUMBER	SWOS-S-SB01-0103	SWOS-S-SB01-0103-D	SWOS-S-SB02-0103	SWOS-S-SB03-0103	SWOS-S-SB04-0103	SWOS-S-SB05-0103	SWOS-S-SB06-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	SAMPLE DEPTH (FT)	1-3	1-3	1-3	1-3	1-3	1-3	1-3
	QC IDENTIFIER	Field Dup.	Field Dup.					
	DUPLICATE		SWOS-S-SB01-0103					
PARAMETER	**SURFACE BACKGROUND VALUE**							
METALS (MG/KG)								
ALUMINUM	11900	13900	13100	10300	10800	8570	9200	3340
ANTIMONY	0.67	0.085 UJ	0.24 UJ	0.68 UJ	0.35 UJ	0.051 UJ	0.052 UJ	0.32 UJ
ARSENIC	5.55	7.8 J	8.0 J	7.1 J	6.8 J	4.9 J	6.5 J	3.0 J
BARIUM	38.5	24.5 J	25.4 J	25.8 J	55.1 J	18.0 J	14.8 J	15.4 J
BERYLLIUM	0.439	0.36 J	0.34 J	0.31 J	0.34 J	0.28 J	0.27 J	0.21 J
CADMIUM	0.7	0.0056 UJ	0.049 UJ	0.063 UJ	0.22 J	0.0051 UJ	0.0051 UJ	0.023 UJ
CALCIUM	1220	1500	1450	1080	1460	792	979	569
CHROMIUM	20.2	12.3 J	11.4 J	64.7	11.6 J	8.8 J	8.5 J	0.55 J
COBALT	9.01	13.0 J	14.9 J	9.3 J	10.0 J	7.6 J	8.4 J	1.7 J
COPPER	23.8	32.3	31.2	32.6	40.1	27.5	24.0	8.6
IRON	23200	32000	40500	23300	27300	22500	22800	7490
LEAD	48.8	43.5 J	36.6 J	74.0	361	17.5 J	21.3 J	10.3 J
MAGNESIUM	2240	3310	3030	1990	2890	2040	2040	853
MANGANESE	372	648	689	297	377	346	286	185
MERCURY	0.189	0.033	0.34	0.76	0.17	0.15	0.054	0.014
NICKEL	17.4	18.5 J	16.8 J	13.9 J	14.5 J	11.4 J	13 J	1.1 J
POTASSIUM	312	275	279	322	388	273	337.0	742
SELENIUM	NA	4.6 J	4.2 J	3.5 J	3.9 J	3.4 J	3.3 J	1.5 J
SILVER	ND	0.019 UJ	0.018 UJ	0.019 UJ	0.019 UJ	0.017 UJ	0.018 UJ	0.017 UJ
SODIUM	NA	41.4	39.7	55.7	49.6	27.5	42.8	30.5
THALLIUM	NA	3.4 J	3.3 J	3.5 J	3.0 J	2.5 J	2.9 J	2.6 J
VANADIUM	22.6	19.3 J	19.4 J	20.1 J	16.4 J	12.7 J	13.9 J	4.1 J
ZINC	225	63.2 J	61.1 J	69.4	239	51.4 J	44.2 J	45.7

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - BACKGROUND VALUE EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED; ND - NOT DETECTED IN DEPTH RANGE

TABLE 4-2

COMPARISON OF METAL CONCENTRATIONS IN SURFACE SOIL SAMPLES TO SURFACE SOIL BACKGROUND METAL VALUES
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB08	SWOS-S-SB09	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB11
	SAMPLE NUMBER	SWOS-S-SB07-0103	SWOS-S-SB07-0103-D	SWOS-S-SB08-0103	SWOS-S-SB09-0103	SWOS-S-SB10-0103	SWOS-S-SB10-0103-D	SWOS-S-SB11-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/16/05	03/16/05	03/16/05	03/16/05
	SAMPLE DEPTH (FT)	1-3	1-3	1-3	1-3	1-3	1-3	1-3
	QC IDENTIFIER	Field Dup.	Field Dup.			Field Dup.	Field Dup.	
	DUPLICATE		SWOS-S-SB07-0103				SWOS-S-SB10-0103	
PARAMETER	**SURFACE BACKGROUND VALUE**							
METALS (MG/KG)								
ALUMINUM	11900	12400	11000	13600	8950 J	9530 J	9930 J	10900 J
ANTIMONY	0.67	0.51 UJ	0.35 UJ	0.12 UJ	0.40 UJ	0.37 UJ	0.27 UJ	0.053 UJ
ARSENIC	5.55	5.3 J	4.2 J	7.8 J	6.6 J	5.3 J	5.6 J	4.6 J
BARIUM	38.5	20.5 J	17.1 J	23.4 J	21.1 J	22.8 J	24.2 J	16.3 J
BERYLLIUM	0.439	0.29 J	0.26 J	0.33 J	0.32 J	0.28 J	0.29 J	0.30 J
CADMIUM	0.7	0.0050 UJ	0.0049 UJ	0.0053 UJ	0.0056 UJ	0.0054 UJ	0.0054 UJ	0.0052 UJ
CALCIUM	1220	2030	1830	2020	1600	1780	1630	1240
CHROMIUM	20.2	15.3 J	13.0 J	13.6 J	9.8 J	8.9 J	10.3 J	11.0 J
COBALT	9.01	16.3 J	12.7 J	12.4 J	9.7 J	7.0 J	7.1 J	10.7 J
COPPER	23.8	37.1	32.6	35.3	32.1 J	26.0 J	26.5 J	27.7 J
IRON	23200	39900	31400	48100	28600	26600	25300	31900
LEAD	48.8	33.7 J	30.3 J	46.2 J	112 J	42.6 J	45.7 J	34.1 J
MAGNESIUM	2240	3830	3500	3610	2720 J	2560 J	2400 J	3010 J
MANGANESE	372	582	477	433	332 J	295 J	285 J	466 J
MERCURY	0.189	0.022	0.022	0.16	0.013 J	0.082	0.074	0.017
NICKEL	17.4	21.9 J	19.0 J	19.2 J	15.1 J	11.9 J	14.6 J	13.8 J
POTASSIUM	312	476	426	312	444	344	338	508
SELENIUM	NA	4.7 J	4.1 J	4.5 J	4.1 J	3.6 J	2.7 J	4.1 J
SILVER	ND	0.017 UJ	0.017 UJ	0.018 UJ	0.019 UJ	0.019 UJ	0.019 UJ	0.018 UJ
SODIUM	NA	48.8	47.4	50.8	36.1	37.6	43.4	33.4
THALLIUM	NA	3.0 J	2.7 J	3.0 R	3.1 J	2.6 J	2.9 J	2.9 J
VANADIUM	22.6	21.7 J	20.8 J	22.2 J	15.8 J	15.6 J	16.2 J	14.6 J
ZINC	225	65.2 J	59.3 J	90.2 J	47.9	58.6	59.9	52.0

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - BACKGROUND VALUE EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED; ND - NOT DETECTED IN DEPTH RANGE

TABLE 4-2

COMPARISON OF METAL CONCENTRATIONS IN SURFACE SOIL SAMPLES TO SURFACE SOIL BACKGROUND METAL VALUES
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB12	SWOS-S-SB13	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15
	SAMPLE NUMBER	SWOS-S-SB12-0103	SWOS-S-SB13-0103	SWOS-S-SB14-0001	SWOS-S-SB14-0102	SWOS-S-SB15-0001	SWOS-S-SB15-0001-D	SWOS-S-SB15-0102
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	SAMPLE DEPTH (FT)	1-3	1-3	0-1	1-2	0-1	0-1	1-2
	QC IDENTIFIER					Field Dup.	Field Dup.	
	DUPLICATE						SWOS-S-SB15-0001	
PARAMETER	**SURFACE BACKGROUND VALUE**							
METALS (MG/KG)								
ALUMINUM	11900	8010 J	10400 J	8320 J	10400 J	10700 J	11400 J	9850 J
ANTIMONY	0.67	0.27 UJ	0.15 UJ	0.16 UJ	0.090 UJ	1.3 UJ	2.4 J	13.4 J
ARSENIC	5.55	4.5 J	8.7 J	5.3 J	8.2 J	9.3 J	10.1 J	9.7 J
BARIUM	38.5	19.1 J	18.9 J	23.6 J	21.0 J	25.8 J	27.3 J	70.5 J
BERYLLIUM	0.439	0.28 J	0.31 J	0.25 J	0.30 J	0.38 J	0.38 J	0.31 J
CADMIUM	0.7	0.046 UJ	0.0080 UJ	0.026 UJ	0.036 UJ	0.043 UJ	0.059 UJ	0.22 J
CALCIUM	1220	2040	1760	2170	1780	2070	3050	2320
CHROMIUM	20.2	8.2 J	11.6 J	7.9	11.6 J	15.1 J	13.7 J	14.4 J
COBALT	9.01	7.0 J	9.8 J	6.1 J	9.4 J	9.8 J	9.8 J	9.2 J
COPPER	23.8	24.3 J	32.2 J	24.2 J	28.5 J	36.0 J	35.0 J	37.5 J
IRON	23200	21500	31500	14800	23800	35700	33800	33300
LEAD	48.8	42.4 J	44.2 J	35.5 J	40.3 J	60.2 J	71.2 J	607 J
MAGNESIUM	2240	2120 J	3180 J	1870 J	2710 J	2980 J	3320 J	2650 J
MANGANESE	372	245 J	320 J	239 J	306 J	347 J	366 J	310 J
MERCURY	0.189	0.061	0.042	0.054	0.076	0.061	0.050	0.12
NICKEL	17.4	11.7 J	17.2 J	10.2 J	15.6 J	16.8 J	16.5 J	15.6 J
POTASSIUM	312	309	400	421	375	536	533	294
SELENIUM	NA	3.0 J	3.8 J	3.0 J	3.4 J	4.0 J	3.9 J	3.3 J
SILVER	ND	0.018 UJ	0.018 UJ	0.019 UJ	0.019 UJ	0.021 UJ	0.017 UJ	0.019 UJ
SODIUM	NA	41.6	54	43.5	49.5	46.7	50.5	44.1
THALLIUM	NA	2.2 J	2.5 J	2.8 J	2.9 J	3.2 J	2.9 J	2.7 J
VANADIUM	22.6	13.4 J	15.8 J	15.1 J	16.7 J	18.7 J	19.1 J	20.4 J
ZINC	225	57.0	77.8	52.3	64.6	88.6	83.6	220

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - BACKGROUND VALUE EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED; ND - NOT DETECTED IN DEPTH RANGE

TABLE 4-2

COMPARISON OF METAL CONCENTRATIONS IN SURFACE SOIL SAMPLES TO SURFACE SOIL BACKGROUND METAL VALUES
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB17	SWOS-S-SB17	SWOS-S-SB17	SWOS-S-SB18	SWOS-S-SB18
	SAMPLE NUMBER	SWOS-S-SB16-0001	SWOS-S-SB16-0102	SWOS-S-SB17-0001	SWOS-S-SB17-0102	SWOS-S-SB17-0102-D	SWOS-S-SB18-0001	SWOS-S-SB18-0102
	SAMPLE DATE	03/16/05	03/16/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05
	SAMPLE DEPTH (FT)	0-1	1-2	0-1	1-2	1-2	0-1	1-2
	QC IDENTIFIER				Field Dup.	Field Dup.		
	DUPLICATE					SWOS-S-SB17-0102		
PARAMETER	**SURFACE BACKGROUND VALUE**							
METALS (MG/KG)								
ALUMINUM	11900	7840 J	11600 J	8340	7650	12400	11000	11600
ANTIMONY	0.67	0.21 UJ	0.065 UJ	0.26 UJ	0.23 UJ	0.22 UJ	0.060 UJ	0.49 UJ
ARSENIC	5.55	4.0 J	6.7 J	8.2 J	4.6 J	7.6 J	6.5 J	8.4 J
BARIUM	38.5	25.1 J	21.4 J	18.8 J	16.5 J	30.1 J	28.7 J	28.7 J
BERYLLIUM	0.439	0.42 J	0.34 J	0.24	0.27	0.43	0.32	0.48
CADMIUM	0.7	0.012 UJ	0.0064 UJ	0.016 UJ	0.0052 UJ	0.017 UJ	0.015 UJ	0.0058 UJ
CALCIUM	1220	1260	1560	1360	1140	1790	1790	1620
CHROMIUM	20.2	6.0 J	12.1 J	10.0	9.6 J	14.9 J	10.8 J	12.9 J
COBALT	9.01	6.4 J	10.6 J	4.6 J	7.9 J	13.4 J	7.4 J	10.9 J
COPPER	23.8	18.5 J	34.6 J	28.5 J	26.8 J	45.5 J	32.5 J	41.1 J
IRON	23200	13100	40100	15600 J	34400 J	42400 J	25200 J	36200 J
LEAD	48.8	29.6 J	28.2 J	37.7 J	41.9 J	59.6 J	44.1 J	71.1 J
MAGNESIUM	2240	1790 J	3080 J	1480 J	2320 J	3540 J	2150 J	2810 J
MANGANESE	372	261 J	450 J	187 J	272 J	467 J	280 J	410 J
MERCURY	0.189	0.042	0.070	0.065	0.034	0.035	0.060	0.045
NICKEL	17.4	8.2 J	17.0 J	8.1 J	13.0 J	21.9 J	12.1 J	18.1 J
POTASSIUM	312	522	400	289 J	291 J	619 J	436 J	329 J
SELENIUM	NA	2.4 J	4.3 J	3.0 J	3.3 J	4.4 J	3.2 J	5.3 J
SILVER	ND	0.017 UJ	0.022 UJ	0.021 UJ	0.018 UJ	0.020 UJ	0.020 UJ	0.020 UJ
SODIUM	NA	51.0	51.3	46.9	30.9	53.9	53.7	52.8
THALLIUM	NA	3.0 J	3.4 J	3.2 J	2.2 R	3.5 J	3.7 J	3.2 J
VANADIUM	22.6	13.2 J	17.1 J	16.7 J	14.0 J	23.7 J	19.4 J	22.4 J
ZINC	225	45.3	60.9	54.2 J	66.2 J	121 J	82.2 J	79.1 J

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - BACKGROUND VALUE EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED; ND - NOT DETECTED IN DEPTH RANGE

TABLE 4-2

COMPARISON OF METAL CONCENTRATIONS IN SURFACE SOIL SAMPLES TO SURFACE SOIL BACKGROUND METAL VALUES
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB19	SWOS-S-SB19	SWOS-S-SB20	SWOS-S-SB20
	SAMPLE NUMBER	SWOS-S-SB19-0001	SWOS-S-SB19-0102	SWOS-S-SB20-0001	SWOS-S-SB20-0102
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05
	SAMPLE DEPTH (FT)	0-1	1-2	0-1	1-2
	QC IDENTIFIER				
	DUPLICATE				
PARAMETER	**SURFACE BACKGROUND VALUE**				
METALS (MG/KG)					
ALUMINUM	11900	9680	11300	3230	9180
ANTIMONY	0.67	0.19 UJ	0.26 UJ	0.052 UJ	0.054 UJ
ARSENIC	5.55	6.0 J	10.0 J	1.6 J	4.1 J
BARIUM	38.5	24.3 J	22.6 J	11.1 J	23.9 J
BERYLLIUM	0.439	0.27	0.36	0.23	0.31
CADMIUM	0.7	0.034 UJ	0.0053 UJ	0.0051 UJ	0.0053 UJ
CALCIUM	1220	1520	1480	507	1050
CHROMIUM	20.2	9.7 J	11.7 J	1.1 J	11.8 J
COBALT	9.01	7.0 J	12.0 J	1.5 J	8.3 J
COPPER	23.8	32.0 J	37.1 J	5.7 J	27.5 J
IRON	23200	26600 J	35800 J	5640 J	24900 J
LEAD	48.8	41.5 J	25.7 J	4.9 J	21.7 J
MAGNESIUM	2240	2180 J	3480 J	465 J	2460 J
MANGANESE	372	345 J	433 J	121 J	250 J
MERCURY	0.189	0.051	0.027	0.0072 U	0.031
NICKEL	17.4	11.3 J	18.2 J	1.7 J	13.9 J
POTASSIUM	312	401 J	546 J	456 J	434 J
SELENIUM	NA	2.8 J	3.8 J	0.90 UJ	3.7 J
SILVER	ND	0.018 UJ	0.018 UJ	0.018 UJ	0.018 UJ
SODIUM	NA	47.5	60.9	33.8	93.3
THALLIUM	NA	3.5 J	3.1 J	1.8 J	3.1 J
VANADIUM	22.6	17.7 J	19.3 J	3.9 J	18.1 J
ZINC	225	60.6 J	80.6 J	20.8 J	50.9 J

* Surface soil values are compared to the calculated 95% Upper Tolerance Limit (UTL) values for each compound as presented in Table 5-1 of the Background Soil Investigation for OFFTA (TtNUS, 2000).

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - BACKGROUND VALUE EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED; ND - NOT DETECTED IN DEPTH RANGE

TABLE 4-3

COMPARISON OF METAL CONCENTRATIONS IN SUBSURFACE SOIL SAMPLES TO SUBSURFACE SOIL BACKGROUND METAL VALUES
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND
PAGE 1 OF 3

	SAMPLE LOCATION	SWOS-S-SB01	SWOS-S-SB02	SWOS-S-SB03	SWOS-S-SB04	SWOS-S-SB05	SWOS-S-SB06	SWOS-S-SB07
	SAMPLE NUMBER	SWOS-S-SB01-0507	SWOS-S-SB02-0305	SWOS-S-SB03-0305	SWOS-S-SB04-0507	SWOS-S-SB05-0305	SWOS-S-SB06-0507	SWOS-S-SB07-0305
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	SAMPLE DEPTH (FT)	5-7	3-5	3-5	5-7	3-5	5-7	3-5
	QC IDENTIFIER							
	DUPLICATE							
PARAMETER	**SUBSURFACE BACKGROUND VALUE**							
METALS (MG/KG)								
ALUMINUM	15800	7780	8630	13200	10800	9360	10500	13000
ANTIMONY	0.42	0.29 UJ	0.44 UJ	0.056 UJ	0.059 UJ	0.49 UJ	0.34 UJ	0.44 UJ
ARSENIC	42.8	3.7 J	7.4 J	4.7 J	3.2 J	5.5 J	5.4 J	9.7 J
BARIUM	21.3	17.2 J	36.8 J	34.1 J	24.4 J	37.1 J	17.3 J	146 J
BERYLLIUM	1.1	0.37 J	0.28 J	0.35 J	0.18 UJ	0.31 J	0.32 J	0.43 J
CADMIUM	ND	0.038 UJ	1.4 J	0.0055 UJ	0.0058 UJ	0.72 J	0.014 UJ	1.3 J
CALCIUM	1080	938	20800	1460	1320	7300	1340	3760
CHROMIUM	24.1	11.1	9.9	12.2 J	10.6 J	12.2 J	11.3 J	10.5 J
COBALT	20.3	26.2	46.9	6.1 J	4.4 J	8.7 J	9.7 J	8.1 J
COPPER	30.9	22.3	24.4	21.0	14.7	47.7	27.6	29.6
IRON	46400	21600	17600	24800	26100	31200	28800	25000
LEAD	15.4	53.0 J	151	42.7 J	12.8 J	596	33.8 J	1400
MAGNESIUM	5310	2150	2560	2350	1850	3640	2790	2820
MANGANESE	563	442	193	143	127	341	286	389
MERCURY	ND	0.033	0.12	0.056	0.029	0.14	0.055	0.052
NICKEL	34.5	11.1 J	10.1 J	11.8 J	9.1 J	15.0 J	15.4 J	17.7 J
POTASSIUM	539	339	391	461	421	327	325	367
SELENIUM	NA	3.2 J	2.2 J	3.5 J	3.2 J	3.0 J	4.2 J	3.9 J
SILVER	12.7	0.018 UJ	1.0 UJ	0.019 UJ	0.020 UJ	0.019 UJ	0.021 UJ	0.024 UJ
SODIUM	NA	57.7	146	64.8	103	71.9	69.6	71.3
THALLIUM	NA	2.5 J	2.7 J	3.6 J	2.2 J	2.5 J	2.5 J	3.7 J
VANADIUM	26	12.8 J	13.6 J	20.5 J	19.0 J	17.2 J	17.7 J	19.2 J
ZINC	175	51.3 J	427	255	34.2 J	601	75.3	622

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - BACKGROUND VALUE EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED; ND - NOT DETECTED IN DEPTH RANGE

TABLE 4-3

COMPARISON OF METAL CONCENTRATIONS IN SUBSURFACE SOIL SAMPLES TO SUBSURFACE SOIL BACKGROUND METAL VALUES
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND
PAGE 2 OF 3

	SAMPLE LOCATION	SWOS-S-SB08	SWOS-S-SB09	SWOS-S-SB10	SWOS-S-SB11	SWOS-S-SB12	SWOS-S-SB13	SWOS-S-SB14
	SAMPLE NUMBER	SWOS-S-SB08-0507	SWOS-S-SB09-0709	SWOS-S-SB10-0305	SWOS-S-SB11-0305	SWOS-S-SB12-0507	SWOS-S-SB13-0507	SWOS-S-SB14-0204
	SAMPLE DATE	03/15/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	SAMPLE DEPTH (FT)	5-7	7-9	3-5	3-5	5-7	5-7	2-4
	QC IDENTIFIER							
	DUPLICATE							
PARAMETER	**SUBSURFACE BACKGROUND VALUE**							
METALS (MG/KG)								
ALUMINUM	15800	9620	8200 J	8470 J	12600 J	7010 J	7590 J	3590 J
ANTIMONY	0.42	0.25 UJ	0.33 UJ	0.11 UJ	0.15 UJ	0.058 UJ	0.058 UJ	0.055 UJ
ARSENIC	42.8	5.8 J	5.8 J	6.1 J	8.4 J	4.8 J	3.3 J	2.4 J
BARIUM	21.3	50.6 J	22.6 J	18.3 J	14.7 J	16.5 J	21.4 J	8.1 J
BERYLLIUM	1.1	0.33 J	0.34 J	0.25 J	0.30 J	0.27 J	0.17 J	0.17 J
CADMIUM	ND	0.0049 UJ	0.0055 UJ	0.0052 UJ	0.038 UJ	0.0057 UJ	0.64 J	0.0054 UJ
CALCIUM	1080	1710	748	1080	1020	836	745	725
CHROMIUM	24.1	10.1 J	22.8	9.6 J	13.4 J	7.3 J	6.4	3.3 J
COBALT	20.3	8.0 J	13.0 J	9.4 J	10.7 J	8.4 J	7.5 J	3.4 J
COPPER	30.9	64.1	30.0 J	24.2 J	34.3 J	20.6 J	13.5 J	11.1 J
IRON	46400	24200	25900	27600	38500	21500	9340	8430
LEAD	15.4	54.5 J	8.3 J	17.5 J	33.6 J	5.9 J	12.8 J	6.5 J
MAGNESIUM	5310	2790	2520 J	2350 J	3090 J	1930 J	1320 J	1280 J
MANGANESE	563	371	331 J	321 J	257 J	289 J	133 J	152 J
MERCURY	ND	0.071	0.0073 U	0.074	0.020	0.0065 U	0.12	0.0065 U
NICKEL	34.5	12.8 J	16.0 J	13.6 J	16.1 J	12.2 J	6.6 J	5.2 J
POTASSIUM	539	333	474	448	313	408	259	334
SELENIUM	NA	3.8 J	3.6 J	3.7 J	4.5 J	3.1 J	2.0 J	1.3 J
SILVER	12.7	0.017 UJ	0.019 UJ	0.018 UJ	0.018 UJ	0.020 UJ	0.020 UJ	0.019 UJ
SODIUM	NA	74.1	30.3	24.6	31.1	41.7	63.2	27.4
THALLIUM	NA	2.4 J	2.5 J	2.5 J	R	2.8 J	2.7 J	1.6 J
VANADIUM	26	15.6 J	14.7 J	15.8 J	15.5 J	12.9 J	13.0 J	5.7 J
ZINC	175	58.9 J	44.1	44.1	87.3	31.2	75.4	21.9

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - BACKGROUND VALUE EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED; ND - NOT DETECTED IN DEPTH RANGE

TABLE 4-3

COMPARISON OF METAL CONCENTRATIONS IN SUBSURFACE SOIL SAMPLES TO SUBSURFACE SOIL BACKGROUND METAL VALUES
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND
PAGE 3 OF 3

	SAMPLE LOCATION	SWOS-S-SB15	SWOS-S-SB16	SWOS-S-SB17	SWOS-S-SB18	SWOS-S-SB19	SWOS-S-SB20
	SAMPLE NUMBER	SWOS-S-SB15-0204	SWOS-S-SB16-0406	SWOS-S-SB17-0406	SWOS-S-SB18-0406	SWOS-S-SB19-0608	SWOS-S-SB20-0204
	SAMPLE DATE	03/16/05	03/16/05	03/17/05	03/17/05	03/17/05	03/17/05
	SAMPLE DEPTH (FT)	2-4	4-6	4-6	4-6	6-8	2-4
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**SUBSURFACE BACKGROUND VALUE**						
METALS (MG/KG)							
ALUMINUM	15800	8230 J	11500	9080	18600	9570	8120
ANTIMONY	0.42	105 J	0.057 UJ	0.54 UJ	0.14 UJ	0.26 UJ	0.12 UJ
ARSENIC	42.8	6.9 J	4.7 J	6.3 J	7.0 J	8.1 J	4.2 J
BARIUM	21.3	82.1 J	21.7 J	18.3 J	7.9 J	15.2 J	19.7 J
BERYLLIUM	1.1	0.25 J	0.31	0.36	0.42	0.39	0.24
CADMIUM	ND	0.82 J	0.0056 UJ	0.0057 UJ	0.0056 UJ	0.0053 UJ	0.0054 UJ
CALCIUM	1080	2510	1610	991	2300	1230	660
CHROMIUM	24.1	14.7	13.6 J	28.0	18.7 J	13.5 J	11.1 J
COBALT	20.3	7.8 J	7.5 J	8.9 J	17.1 J	14.7 J	5.3 J
COPPER	30.9	50.6 J	55.8 J	30.2 J	44.4 J	40.0 J	17.3 J
IRON	46400	16600	27500 J	25600 J	58500 J	43600 J	23200 J
LEAD	15.4	1010 J	27.2 J	76.5 J	13.1 J	12.0 J	6.4 J
MAGNESIUM	5310	2030 J	3180 J	2430 J	5910 J	3120 J	2190 J
MANGANESE	563	193 J	245 J	336 J	348 J	435 J	205 J
MERCURY	ND	0.25	0.057	0.015	0.0074 U	0.0081 J	0.0070 U
NICKEL	34.5	14.6 J	14.9 J	14.4 J	27.8 J	23.7 J	12.3 J
POTASSIUM	539	273	354 J	379 J	308 J	510 J	414 J
SELENIUM	NA	3.4 J	3.4 J	3.7 J	5.0 J	4.8 J	2.6 J
SILVER	12.7	0.021 UJ	0.019 UJ	0.02 UJ	0.019 UJ	0.018 UJ	0.019 UJ
SODIUM	NA	45.8	29.9	45.9	28.5	55.8	95.6
THALLIUM	NA	2.5 J	2.7 J	3.0 J	R	R	3.2 J
VANADIUM	26	25.4 J	18.1 J	15.6 J	25.8 J	16.2 J	16.2 J
ZINC	175	439	63.8 J	48.7 J	83.3 J	54.8 J	29.4 J

* Subsurface soil values are compared to the calculated 95% Upper Tolerance Limit (UTL) values for each compound as presented in Table 5-1 of the Background Soil Investigation for OFFTA (TtNUS, 2000).

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - BACKGROUND VALUE EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED; ND - NOT DETECTED IN DEPTH RANGE

TABLE 4-4

SUMMARY OF DETECTED ANALYTICAL RESULTS - GROUNDWATER
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05
	SAMPLE NUMBER	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05-D
	SAMPLE DATE	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05
	QC IDENTIFIER						Field Dup.	Field Dup.
	DUPLICATE							SWOS-A-MW05
PARAMETER	**PAL (1)**							
VOLATILES BY METHOD 8260B (UG/L)								
ACETONE	61	5 UJ	420 J	5 UJ	5 UJ	5 UJ	130 J	130 J
CARBON DISULFIDE	100	0.5 U	2.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CYCLOHEXANE	3500	0.5 U	0.5 U	0.5 U	0.5 U	0.36 J	0.5 U	0.5 U
ISOPROPYLBENZENE	66	0.5 U	0.5 U	0.5 U	0.5 U	1.2	0.5 U	0.5 U
METHYL TERT-BUTYL ETHER	13	0.5 U	1	0.53	0.5 U	0.36 J	0.5 U	0.5 U
SEMIVOLATILES BY METHOD 8270C (UG/L)								
2-METHYLNAPHTHALENE		10 U	2 J	10 U	10 U	5 J	10 U	10 U
ACENAPHTHENE	36	10 U	10 U	10 U	10 U	1 J	4 J	2 J
ACENAPHTHYLENE		10 U	10 U	10 U	10 U	10 U	1 J	1 J
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	10 U	3 J	10 U	10 U	10 U	10 U	10 U
CAPROLACTAM	1800	59	10 U	10 U	27	14	23	19
DIBENZOFURAN	2.4	10 U	10 U	10 U	10 U	1 J	3 J	2 J
FLUORENE	24	10 U	10 U	10 U	10 U	1 J	5 J	4 J
NAPHTHALENE	0.62	10 U	10 U	10 U	10 U	2 J	10 U	10 U
TOTAL PAH		10 U	2	10 U	10 U	9	10	7
PETROLEUM HYDROCARBONS BY METHOD GRO_W (MG/L)								
GASOLINE RANGE ORGANICS		0.050 U	0.050 U	0.050 U	0.050 U	0.110	0.120	0.110
PETROLEUM HYDROCARBONS BY METHOD TPH_W (MG/L)								
DIESEL RANGE ORGANICS		0.35 U	0.36	0.35 U	0.35 U	0.92	0.85	0.8
ALUMINUM	3600	48.7 U	4990	107	145	380	155	156
BARIUM	260	10	36.5	18.1	36.6	90.6	15.7	15.4
BERYLLIUM	7.3	0.15 U	0.19 J	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
CALCIUM		83300	9840	14100	61900	NA	17500	NA
CHROMIUM	100 (2)	NA	10.7	0.75 UJ	0.80 U	0.76 U	0.38 U	0.38 U
COBALT	73	0.15 U	4.6	10.3	1.7	2.9	2.1	NA
IRON	1100	272 U	8820	292 U	2280 U	8090	3600	4820
LEAD	15 (2)	NA	8.7	0.46 U	0.76 UJ	3.1 U	0.85 UJ	1.2 U
MAGNESIUM		20800	1820	11400	12700	12400	7770	7480
MANGANESE	88	313	151	1470	646	2740	1900	1830
NICKEL	73	3.0	9.7	10.4	2.1	19.5 B	12.3	11.8
POTASSIUM		5800	9910	5130	5090	5840	3910	3830
SODIUM		32900	9620	77200	73600	60100	56900	54900
VANADIUM	26	0.47 U	8.1	0.47 U	0.47 U	1.0 U	0.57 UJ	0.63 UJ

(1) EPA Region IX PRGs for Tap Water adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.

(2) Federal Maximum Contaminent Level for drinking water.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

TABLE 6-1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: SWOS

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background (2) Value	Screening (3) Toxicity Value	COPC Flag	Rationale for (4) Contaminant Deletion or Selection
7429-90-5	ALUMINUM	3230		13900		MG/KG	SWOS-S-SB01-0103-MAX	27/27	-	13900	11900		NO	EPA-I
7440-36-0	ANTIMONY	2.4		13.4	J	MG/KG	SWOS-S-SB15-0102	2/27	0.051 - 0.68	13.4	0.67	3.1	YES	ASL
7440-38-2	ARSENIC	1.6	J	10.1		MG/KG	SWOS-S-SB15-0001-MAX	27/27	-	10.1	5.55	0.39	YES	ASL
7440-39-3	BARIUM	11.1	J	70.5	J	MG/KG	SWOS-S-SB15-0102	27/27	-	70.5	38.5	540	NO	BSL
7440-41-7	BERYLLIUM	0.21	J	0.48		MG/KG	SWOS-S-SB18-0102	27/27	-	0.48	0.439	0.4	YES	ASL
7440-43-9	CADMIUM	0.22	J	0.22	J	MG/KG	SWOS-S-SB15-0102, SWOS-S-SB03-0103	2/27	0.005 - 0.063	0.22	0.7	3.7	NO	BSL
7440-70-2	CALCIUM	507		3050		MG/KG	SWOS-S-SB15-0001-MAX	27/27	-	3050	1220		NO	NTX
7440-47-3	CHROMIUM	0.55	J	64.7		MG/KG	SWOS-S-SB02-0103	27/27	-	64.7	20.2	30	YES	ASL
7440-48-4	COBALT	1.5	J	16.3		MG/KG	SWOS-S-SB07-0103-MAX	27/27	-	16.3	9.01		NO	EPA-I
7440-50-8	COPPER	5.7	J	45.5		MG/KG	SWOS-S-SB17-0102-MAX	27/27	-	45.5	23.8		NO	EPA-I
7439-89-6	IRON	5640	J	48100		MG/KG	SWOS-S-SB08-0103	27/27	-	48100	23200		NO	EPA-I
7439-92-1	LEAD	4.9	J	607	J	MG/KG	SWOS-S-SB15-0102	27/27	-	607	48.8	150	YES	ASL
7439-95-4	MAGNESIUM	465	J	3830		MG/KG	SWOS-S-SB07-0103-MAX	27/27	-	3830	2240		NO	NTX
7439-96-5	MANGANESE	121	J	689		MG/KG	SWOS-S-SB01-0103-MAX	27/27	-	689	372	180	YES	ASL
7439-97-6	MERCURY	0.013	J	0.76		MG/KG	SWOS-S-SB02-0103	26/27	0.0072 - 0.0072	0.76	0.189	2.3	NO	BSL
7440-02-0	NICKEL	1.1	J	21.9		MG/KG	SWOS-S-SB07-0103-MAX, SWOS-S-SB17-0102-MAX	27/27	-	21.9	17.4	160	NO	BSL
7440-09-7	POTASSIUM	273		742		MG/KG	SWOS-S-SB06-0103	27/27	-	742	312		NO	NTX
7782-49-2	SELENIUM	1.5	J	5.3	J	MG/KG	SWOS-S-SB18-0102	26/27	0.9 - 0.9	5.3		39	NO	BSL
7440-23-5	SODIUM	27.5		93.3		MG/KG	SWOS-S-SB20-0102	27/27	-	93.3			NO	NTX
7440-28-0	THALLIUM	1.8	J	3.7	J	MG/KG	SWOS-S-SB18-0001	26/26	-	3.7		0.52	YES	ASL
7440-62-2	VANADIUM	3.9	J	23.7		MG/KG	SWOS-S-SB17-0102-MAX	27/27	-	23.7	22.6	55	NO	BSL
7440-66-6	ZINC	20.8	J	239		MG/KG	SWOS-S-SB03-0103	27/27	-	239	225	2300	NO	BSL
92-52-4	1,1-BIPHENYL	79	J	79	J	UG/KG	SWOS-S-SB14-0001	1/27	340 - 460	79			NO	NTX
91-57-6	2-METHYLNAPHTHALENE	41	J	510		UG/KG	SWOS-S-SB14-0001	3/27	340 - 460	510		5600	NO	BSL
106-44-5	4-METHYLPHENOL	73	J	73	J	UG/KG	SWOS-S-SB14-0001	1/27	340 - 460	73		31000	NO	BSL
83-32-9	ACENAPHTHENE	45	J	840		UG/KG	SWOS-S-SB14-0001	4/27	340 - 460	840		43000	NO	BSL
208-96-8	ACENAPHTHYLENE	40	J	110		UG/KG	SWOS-S-SB07-0103-MAX	4/27	340 - 460	110		5600	NO	BSL
120-12-7	ANTHRACENE	42	J	1300		UG/KG	SWOS-S-SB14-0001	18/27	340 - 390	1300		35000	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	43	J	2300		UG/KG	SWOS-S-SB14-0001	27/27	-	2300		620	YES	ASL
50-32-8	BENZO(A)PYRENE	39	J	1700		UG/KG	SWOS-S-SB14-0001	27/27	-	1700		62	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	53	J	2500		UG/KG	SWOS-S-SB14-0001	27/27	-	2500		620	YES	ASL
191-24-2	BENZO(G,H,I)PERYLENE	41	J	840		UG/KG	SWOS-S-SB14-0001	20/27	340 - 380	840		800	YES	ASL
207-08-9	BENZO(K)FLUORANTHENE	40	J	900		UG/KG	SWOS-S-SB14-0001	26/27	370 - 370	900		900	NO	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	40	J	160	J	UG/KG	SWOS-S-SB20-0001	23/27	340 - 390	160		35000	NO	BSL
86-74-8	CARBAZOLE	42		980	J	UG/KG	SWOS-S-SB14-0001	10/27	340 - 400	980		24000	NO	BSL
218-01-9	CHRYSENE	78	J	2200		UG/KG	SWOS-S-SB14-0001	26/27	370 - 370	2200		400	YES	ASL
53-70-3	DIBENZO(A,H)ANTHRACENE	40	J	230	J	UG/KG	SWOS-S-SB14-0001	5/27	340 - 460	230		62	YES	ASL
132-64-9	DIBENZOFURAN	43	J	540		UG/KG	SWOS-S-SB14-0001	3/27	340 - 460	540		29000	NO	BSL
206-44-0	FLUORANTHENE	81	J	5900		UG/KG	SWOS-S-SB14-0001	27/27	-	5900		20000	NO	BSL
86-73-7	FLUORENE	37	J	870		UG/KG	SWOS-S-SB14-0001	7/27	340 - 460	870		28000	NO	BSL

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil
Exposure Point: SWOS

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background (2) Value	Screening (3) Toxicity Value	COPC Flag	Rationale for (4) Contaminant Deletion or Selection
TTNUS077	HIGH MOLECULAR WEIGHT PAHS	135		11440		UG/KG	SWOS-S-SB14-0001	27/27	-	11440			NO	NTX
193-39-5	INDENO(1,2,3-CD)PYRENE	40	J	770		UG/KG	SWOS-S-SB14-0001	23/27	360 - 390	770		620	YES	ASL
TTNUS076	LOW MOLECULAR WEIGHT PAHS	157		22764		UG/KG	SWOS-S-SB14-0001	27/27	-	22764			NO	NTX
91-20-3	NAPHTHALENE	42	J	1600		UG/KG	SWOS-S-SB14-0001	5/27	340 - 420	1600		5600	NO	BSL
85-01-8	PHENANTHRENE	56	J	6200		UG/KG	SWOS-S-SB14-0001	24/27	340 - 390	6200		40000	NO	BSL
108-95-2	PHENOL	48	J	48	J	UG/KG	SWOS-S-SB14-0001	1/27	340 - 460	48		3700000	NO	BSL
129-00-0	PYRENE	76	J	5500		UG/KG	SWOS-S-SB14-0001	27/27	-	5500		13000	NO	BSL
TTNUS072	TOTAL PAHS	292		34204		UG/KG	SWOS-S-SB14-0001	27/27	-	34204			NO	NTX
75-09-2	METHYLENE CHLORIDE	5		13		UG/KG	SWOS-S-SB02-0103, SWOS-S-SB07-0103-MAX	8/27	4 - 27	13		9100	NO	BSL
100-42-5	STYRENE	2	J	2	J	UG/KG	SWOS-S-SB13-0103	1/27	4 - 7	2		13000	NO	BSL
CALC028	TOTAL CHLORINATED VOCS	5		13		UG/KG	SWOS-S-SB02-0103, SWOS-S-SB07-0103-MAX	8/27	4 - 7	13			NO	NTX
75-69-4	TRICHLOROFLUOROMETHANE	1	J	1	J	UG/KG	SWOS-S-SB19-0001	1/27	4 - 7	1		39000	NO	BSL
72-54-8	4,4'-DDD	8.2		31	J	UG/KG	SWOS-S-SB15-0102	2/27	3.4 - 39	31		2400	NO	BSL
72-55-9	4,4'-DDE	4.7		290		UG/KG	SWOS-S-SB18-0102	17/27	3.4 - 4.6	290		1700	NO	BSL
50-29-3	4,4'-DDT	4.6		250		UG/KG	SWOS-S-SB18-0102	15/27	3.4 - 4.6	250		1700	NO	BSL
5103-71-9	ALPHA-CHLORDANE	3	J	8.2	J	UG/KG	SWOS-S-SB15-0102	2/27	1.8 - 20	8.2		1600	NO	BSL
11096-82-5	AROCLOR-1260	63		63		UG/KG	SWOS-S-SB16-0001	1/27	34 - 46	63		220	NO	BSL
319-85-7	BETA-BHC	4		5.1	J	UG/KG	SWOS-S-SB16-0001	5/24	1.8 - 20	5.1		320	NO	BSL
1031-07-8	ENDOSULFAN SULFATE	8.8	J	8.8	J	UG/KG	SWOS-S-SB08-0103	1/26	3.4 - 39	8.8		37000	NO	BSL
72-20-8	ENDRIN	9.8	J	9.8	J	UG/KG	SWOS-S-SB15-0102	1/27	3.4 - 39	9.8		1800	NO	BSL
5103-74-2	GAMMA-CHLORDANE	7.8	J	7.8	J	UG/KG	SWOS-S-SB15-0102	1/27	1.8 - 20	7.8		1600	NO	BSL
TTNUS004	DIESEL RANGE ORGANICS	20		480		MG/KG	SWOS-S-SB07-0103-MAX	26/27	13 - 13	480			NO	NTX
TTNUS005	GASOLINE RANGE ORGANICS	1400		2400		MG/KG	SWOS-S-SB19-0001, SWOS-S-SB17-0001	7/27	1.6 - 1400	2400			NO	NTX

Notes:

(1) Minimum/maximum detected concentration.

(2) N/A - Refer to supporting information for background discussion.
Background values are the OFFTA site background concentrations.

(3) Lower of RIDEM Soil Direct Exposure Criteria for residential use or Region IX PRG residential soil 2002.
Region IX PRGs for non-carcinogens have been adjusted by a factor of 0.1 to correspond to an HI of 0.1

(4) Rationale Codes Selection Reason: Above Screening Levels (ASL)

Deletion Reason:
Background Levels (BKG)
No Toxicity Information (NTX)
Below Screening Level (BSL)
EPA Region I does not advocate quantitative risk evaluation of this contaminant (EPA I) given lack of approved toxicity criteria

Definitions:
COPC = Chemical of Potential Concern
J = Estimated Value
max = Region IX PRG for this non-carcinogen was based on a ceiling limit. The value shown is the lesser of the ceiling limit or 1/10 of the original Region IX PRG.

TABLE 6-2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil
Exposure Point: SWOS

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7429-90-5	ALUMINUM	3590	J	18600		MG/KG	SWOS-S-SB18-0406	20/20	-	18600	15800		NO	EPA-I
7440-36-0	ANTIMONY	105	J	105	J	MG/KG	SWOS-S-SB15-0204	1/20	0.055 - 0.54	105	0.42	3.1	YES	ASL
7440-38-2	ARSENIC	2.4	J	9.7	J	MG/KG	SWOS-S-SB07-0305	20/20	-	9.7	42.8	0.39	NO	BKG
7440-39-3	BARIUM	7.9	J	146	J	MG/KG	SWOS-S-SB07-0305	20/20	-	146	21.3	540	NO	BSL
7440-41-7	BERYLLIUM	0.17	J	0.43	J	MG/KG	SWOS-S-SB07-0305	19/20	0.18 - 0.18	0.43	1.1	0.4	NO	BKG
7440-43-9	CADMIUM	0.64	J	1.4	J	MG/KG	SWOS-S-SB02-0305	5/20	0.0049 - 0.038	1.4	ND	3.7	NO	BSL
7440-70-2	CALCIUM	660		20800		MG/KG	SWOS-S-SB02-0305	20/20	-	20800	1080		NO	NTX
7440-47-3	CHROMIUM	3.3	J	28		MG/KG	SWOS-S-SB17-0406	20/20	-	28	24.1	30	NO	BSL
7440-48-4	COBALT	3.4	J	46.9		MG/KG	SWOS-S-SB02-0305	20/20	-	46.9	20.3		NO	EPA-I
7440-50-8	COPPER	11.1	J	64.1		MG/KG	SWOS-S-SB08-0507	20/20	-	64.1	30.9		NO	EPA-I
7439-89-6	IRON	8430		58500	J	MG/KG	SWOS-S-SB18-0406	20/20	-	58500	46400		NO	EPA-I
7439-92-1	LEAD	5.9	J	1400		MG/KG	SWOS-S-SB07-0305	20/20	-	1400	15.4	150	YES	ASL
7439-95-4	MAGNESIUM	1280	J	5910	J	MG/KG	SWOS-S-SB18-0406	20/20	-	5910	5310		NO	NTX
7439-96-5	MANGANESE	127		442		MG/KG	SWOS-S-SB01-0507	20/20	-	442	563	180	NO	BKG
7439-97-6	MERCURY	0.0081	J	0.25		MG/KG	SWOS-S-SB15-0204	15/20	0.0065 - 0.0074	0.25	ND	2.3	NO	BSL
7440-02-0	NICKEL	5.2	J	27.8	J	MG/KG	SWOS-S-SB18-0406	20/20	-	27.8	34.5	160	NO	BSL
7440-09-7	POTASSIUM	259		510	J	MG/KG	SWOS-S-SB19-0608	20/20	-	510	539		NO	NTX
7782-49-2	SELENIUM	1.3	J	5	J	MG/KG	SWOS-S-SB18-0406	20/20	-	5		39	NO	BSL
7440-23-5	SODIUM	24.6		146		MG/KG	SWOS-S-SB02-0305	20/20	-	146			NO	NTX
7440-28-0	THALLIUM	1.6	J	3.7	J	MG/KG	SWOS-S-SB07-0305	17/17	-	3.7		0.52	YES	ASL
7440-62-2	VANADIUM	5.7	J	25.8	J	MG/KG	SWOS-S-SB18-0406	20/20	-	25.8	26	55	NO	BSL
7440-66-6	ZINC	21.9		622		MG/KG	SWOS-S-SB07-0305	20/20	-	622	175	2300	NO	BSL
105-67-9	2,4-DIMETHYLPHENOL	76	J	76	J	UG/KG	SWOS-S-SB05-0305	1/20	350 - 2100	76		120000	NO	BSL
91-57-6	2-METHYLNAPHTHALENE	44	J	31000		UG/KG	SWOS-S-SB12-0507	6/20	350 - 2100	31000		5600	NO	BSL
106-44-5	4-METHYLPHENOL	120	J	120	J	UG/KG	SWOS-S-SB05-0305	1/20	350 - 2100	120		31000	NO	BSL
83-32-9	ACENAPHTHENE	38	J	1900		UG/KG	SWOS-S-SB12-0507	5/20	350 - 2200	1900		43000	NO	BSL
208-96-8	ACENAPHTHYLENE	79	J	880		UG/KG	SWOS-S-SB05-0305	4/20	350 - 2100	880		5600	NO	BSL
120-12-7	ANTHRACENE	67	J	1800		UG/KG	SWOS-S-SB16-0406	9/20	350 - 2100	1800		35000	NO	BSL
100-52-7	BENZALDEHYDE	300	J	300	J	UG/KG	SWOS-S-SB05-0305	1/20	350 - 2100	300		610000	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	42	J	3800	J	UG/KG	SWOS-S-SB05-0305	13/20	350 - 400	3800		620	YES	ASL
50-32-8	BENZO(A)PYRENE	52	J	4500	J	UG/KG	SWOS-S-SB05-0305	11/20	350 - 420	4500		62	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	61	J	6100	J	UG/KG	SWOS-S-SB05-0305	12/20	350 - 400	6100		620	YES	ASL
191-24-2	BENZO(G,H,I)PERYLENE	39	J	1200	J	UG/KG	SWOS-S-SB05-0305	9/20	350 - 2100	1200		800	YES	ASL
207-08-9	BENZO(K)FLUORANTHENE	56	J	2800	J	UG/KG	SWOS-S-SB05-0305	10/20	350 - 420	2800		900	YES	ASL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	39	J	140	J	UG/KG	SWOS-S-SB04-0507	16/20	380 - 2100	140		35000	NO	BSL
85-68-7	BUTYL BENZYL PHTHALATE	410	J	410	J	UG/KG	SWOS-S-SB15-0204	1/20	350 - 500	410		1200000	NO	BSL
86-74-8	CARBAZOLE	42	J	430		UG/KG	SWOS-S-SB16-0406	4/20	350 - 2100	430		24000	NO	BSL
218-01-9	CHRYSENE	49	J	3800	J	UG/KG	SWOS-S-SB05-0305	13/20	350 - 400	3800		400	YES	ASL
53-70-3	DIBENZO(A,H)ANTHRACENE	120	J	400	J	UG/KG	SWOS-S-SB05-0305	4/20	350 - 2100	400		62	YES	ASL
132-64-9	DIBENZOFURAN	310	J	1500		UG/KG	SWOS-S-SB12-0507	4/20	350 - 2100	1500		29000	NO	BSL
206-44-0	FLUORANTHENE	64	J	6600		UG/KG	SWOS-S-SB16-0406	15/20	350 - 400	6600		20000	NO	BSL
86-73-7	FLUORENE	41	J	2300		UG/KG	SWOS-S-SB12-0507	7/20	350 - 2100	2300		28000	NO	BSL

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Subsurface Soil
Exposure Point: SWOS

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
TTNUS077	HIGH MOLECULAR WEIGHT PAHS	91		23900		UG/KG	SWOS-S-SB05-0305	13/20	350 - 400	23900			NO	NTX
193-39-5	INDENO(1,2,3-CD)PYRENE	40	J	1300	J	UG/KG	SWOS-S-SB05-0305	10/20	350 - 420	1300		620	YES	ASL
TTNUS076	LOW MOLECULAR WEIGHT PAHS	41		46400		UG/KG	SWOS-S-SB12-0507	17/20	360 - 370	46400			NO	NTX
91-20-3	NAPHTHALENE	79	J	5800		UG/KG	SWOS-S-SB12-0507	5/20	350 - 2100	5800		5600	YES	ASL
85-01-8	PHENANTHRENE	120	J	6200		UG/KG	SWOS-S-SB16-0406	13/20	350 - 400	6200		40000	NO	BSL
108-95-2	PHENOL	50	J	50	J	UG/KG	SWOS-S-SB05-0305	1/20	350 - 2100	50		3700000	NO	BSL
129-00-0	PYRENE	41	J	7800		UG/KG	SWOS-S-SB05-0305	17/20	360 - 370	7800		13000	NO	BSL
TTNUS072	TOTAL PAHS	41		46491		UG/KG	SWOS-S-SB12-0507	17/20	360 - 370	46491			NO	NTX
71-43-2	BENZENE	1	J	5	J	UG/KG	SWOS-S-SB12-0507	2/20	3 - 7	5		600	NO	BSL
TTNUS143	BTEX	1		6		UG/KG	SWOS-S-SB12-0507	2/20	3 - 7	6			NO	NTX
75-15-0	CARBON DISULFIDE	2	J	2	J	UG/KG	SWOS-S-SB06-0507	1/20	3 - 7	2		36000	NO	BSL
67-66-3	CHLOROFORM	5	J	5	J	UG/KG	SWOS-S-SB11-0305	1/20	3 - 7	5		360	NO	BSL
98-82-8	ISOPROPYLBENZENE	3	J	270	J	UG/KG	SWOS-S-SB12-0507	4/20	3 - 7	270		57000	NO	BSL
108-87-2	METHYL CYCLOHEXANE	18		30	J	UG/KG	SWOS-S-SB18-0406	2/20	3 - 7	30		260000	NO	BSL
75-09-2	METHYLENE CHLORIDE	4	J	14		UG/KG	SWOS-S-SB05-0305	7/20	6 - 19	14		9100	NO	BSL
108-88-3	TOLUENE	1	J	1	J	UG/KG	SWOS-S-SB12-0507	1/20	3 - 7	1		52000	NO	BSL
CALC028	TOTAL CHLORINATED VOCS	4		14		UG/KG	SWOS-S-SB05-0305	8/20	3 - 7	14			NO	NTX
75-69-4	TRICHLOROFLUOROMETHANE	1	J	1	J	UG/KG	SWOS-S-SB17-0406	1/20	3 - 7	1		39000	NO	BSL
72-54-8	4,4'-DDD	21	J	49	J	UG/KG	SWOS-S-SB15-0204	2/20	3.5 - 5	49		2400	NO	BSL
72-55-9	4,4'-DDE	4.2	J	37		UG/KG	SWOS-S-SB15-0204	2/20	3.5 - 5	37		1700	NO	BSL
50-29-3	4,4'-DDT	15		15		UG/KG	SWOS-S-SB15-0204	1/19	3.5 - 5	15		1700	NO	BSL
5103-71-9	ALPHA-CHLORDANE	7.4	J	7.4	J	UG/KG	SWOS-S-SB15-0204	1/20	1.8 - 2.6	7.4		1600	NO	BSL
319-85-7	BETA-BHC	5.4	J	5.4	J	UG/KG	SWOS-S-SB18-0406	1/20	1.8 - 2.6	5.4		320	NO	BSL
1031-07-8	ENDOSULFAN SULFATE	36	J	36	J	UG/KG	SWOS-S-SB05-0305	1/19	3.5 - 5	36		37000	NO	BSL
7421-93-4	ENDRIN ALDEHYDE	5.3	J	5.3	J	UG/KG	SWOS-S-SB15-0204	1/20	3.5 - 5	5.3		1800	NO	BSL
5103-74-2	GAMMA-CHLORDANE	10		10		UG/KG	SWOS-S-SB15-0204	1/20	1.8 - 2.6	10		1600	NO	BSL
72-43-5	METHOXYCHLOR	22	J	78	J	UG/KG	SWOS-S-SB05-0305	2/20	18 - 26	78		31000	NO	BSL
TTNUS004	DIESEL RANGE ORGANICS	15		7200		MG/KG	SWOS-S-SB08-0507	20/20	-	7200			NO	NTX
TTNUS005	GASOLINE RANGE ORGANICS	15		160		MG/KG	SWOS-S-SB12-0507, SWOS-S-SB18-0406	7/20	1.4 - 2.1	160			NO	NTX

Notes:

(1) Minimum/maximum detected concentration.
(2) N/A - Refer to supporting information for background discussion.
Background values are the OFFTA site background concentrations.
(3) Lower of RIDEM Soil Direct Exposure Criteria for residential use or Region IX PRG residential soil 2002.
Region IX PRGs for non-carcinogens have been adjusted by a factor of 0.1 to correspond to an HI of 0.1
(4) Rationale Codes Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Background Levels (BKG)
No Toxicity Information (NTX)
Below Screening Level (BSL)
EPA Region I does not advocate quantitative risk evaluation of this contaminant (EPA I) given lack of approved toxicity criteria

Definitions: ND = Not detected in depth range
COPC = Chemical of Potential Concern
J = Estimated Value

TABLE 6-3

DRAFT FINAL

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: SWOS

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening (2) Toxicity Value	COPC Flag	Rationale for (3) Contaminant Deletion or Selection
7429-90-5	ALUMINUM	107		4990		UG/L	SWOS-A-MW01	5/5	-	4990	3600	YES	ASL
7440-39-3	BARIUM	15.4		90.6		UG/L	SWOS-A-MW04	5/5	-	90.6	260	NO	BSL
7440-41-7	BERYLLIUM	0.19	J	0.19	J	UG/L	SWOS-A-MW01	1/5	0.15 - 0.15	0.19	7.3	NO	BSL
7440-70-2	CALCIUM	9840		61900		UG/L	SWOS-A-MW03	4/4	-	61900		NO	NTX
7440-47-3	CHROMIUM	10.7		10.7		UG/L	SWOS-A-MW01	1/5	0.38 - 0.8	10.7	100	NO	BSL
7440-48-4	COBALT	1.7		10.3		UG/L	SWOS-A-MW02	5/5	-	10.3	73	NO	BSL
7439-89-6	IRON	3600		8820		UG/L	SWOS-A-MW01	3/5	292 - 2280	8820	1100	YES	ASL
7439-92-1	LEAD	8.7		8.7		UG/L	SWOS-A-MW01	1/5	0.46 - 3.1	8.7	15	NO	BSL
7439-95-4	MAGNESIUM	1820		12700		UG/L	SWOS-A-MW03	5/5	-	12700		NO	NTX
7439-96-5	MANGANESE	151		2740		UG/L	SWOS-A-MW04	5/5	-	2740	88	YES	ASL
7440-02-0	NICKEL	2.1		19.5	B	UG/L	SWOS-A-MW04	5/5	-	19.5	73	NO	BSL
7440-09-7	POTASSIUM	3830		9910		UG/L	SWOS-A-MW01	5/5	-	9910		NO	NTX
7440-23-5	SODIUM	9620		77200		UG/L	SWOS-A-MW02	5/5	-	77200		NO	NTX
7440-62-2	VANADIUM	8.1		8.1		UG/L	SWOS-A-MW01	1/5	0.47 - 1	8.1	26	NO	BSL
91-57-6	2-METHYLNAPHTHALENE	2	J	5	J	UG/L	SWOS-A-MW04	2/5	10 - 10	5		NO	NTX
83-32-9	ACENAPHTHENE	1	J	4	J	UG/L	SWOS-A-MW05	2/5	10 - 10	4	36	NO	BSL
208-96-8	ACENAPHTHYLENE	1	J	1		UG/L	SWOS-A-MW05-AVG	1/5	10 - 10	1	36	NO	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	3	J	3	J	UG/L	SWOS-A-MW01	1/5	10 - 10	3	4.8	NO	BSL
105-60-2	CAPROLACTAM	14		27		UG/L	SWOS-A-MW03	3/5	10 - 10	27	1800	NO	BSL
132-64-9	DIBENZOFURAN	1	J	3	J	UG/L	SWOS-A-MW05	2/5	10 - 10	3	2.4	YES	ASL
86-73-7	FLUORENE	1	J	5	J	UG/L	SWOS-A-MW05	2/5	10 - 10	5	24	NO	BSL
TTNUS076	LOW MOLECULAR WEIGHT PAHS	2		10		UG/L	SWOS-A-MW05	3/5	10 - 10	10		NO	NTX
91-20-3	NAPHTHALENE	2	J	2	J	UG/L	SWOS-A-MW04	1/5	10 - 10	2	0.62	YES	ASL
TTNUS072	TOTAL PAHS	2		10		UG/L	SWOS-A-MW05	3/5	10 - 10	10		NO	NTX
67-64-1	ACETONE	130	J	420	J	UG/L	SWOS-A-MW01	2/5	5 - 5	420	61	NO	ASL*
75-15-0	CARBON DISULFIDE	2.5		2.5		UG/L	SWOS-A-MW01	1/5	0.5 - 0.5	2.5	100	NO	BSL
110-82-7	CYCLOHEXANE	0.36	J	0.36	J	UG/L	SWOS-A-MW04	1/5	0.5 - 0.5	0.36	3500	NO	BSL
98-82-8	ISOPROPYLBENZENE	1.2		1.2		UG/L	SWOS-A-MW04	1/5	0.5 - 0.5	1.2	66	NO	BSL
1634-04-4	METHYL TERT-BUTYL ETHER	0.36	J	1		UG/L	SWOS-A-MW01	3/5	0.5 - 0.5	1	13	NO	BSL
TTNUS004	DIESEL RANGE ORGANICS	0.36		0.92		MG/L	SWOS-A-MW04	3/5	0.35 - 0.35	0.92		NO	NTX
TTNUS005	GASOLINE RANGE ORGANICS	0.11		0.12		UG/L	SWOS-A-MW05	2/5	0.05 - 0.05	0.12		NO	NTX

Notes:

(1) Minimum/maximum detected concentration.
(2) Lower of EPA Region IX PRG for Tap Water 2002, MCL, or RIDEM DEC for Groundwater (GB).
Region IX PRGs for non-carcinogens have been adjusted by a factor of 0.1 to correspond to an HI of 0.1

(3) Rationale Codes Selection Reason: Above Screening Levels (ASL)

Deletion Reason:

Background Levels (BKG)
No Toxicity Information (NTX)
Below Screening Level (BSL)
EPA Region I does not advocate quantitative risk evaluation of this contaminant (EPA I) given lack of approved toxicity criteria

* Acetone was considered a laboratory contaminant and was not selected as a COPC.

Definitions: COPC = Chemical of Potential Concern
J = Estimated Value
B= Present in equipment blank

TABLE 6-4

SUMMARY OF SELECTED CHEMICALS OF POTENTIAL CONCERN
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

Matrix	Chemicals of Potential Concern
Surface Soil	ANTIMONY ARSENIC BERYLLIUM CHROMIUM LEAD MANGANESE THALLIUM BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE BENZO(G,H,I)PERYLENE CHRYSENE DIBENZO(A,H)ANTHRACENE INDENO(1,2,3-CD)PYRENE
Subsurface Soil	ANTIMONY LEAD THALLIUM BENZO(A)ANTHRACENE BENZO(A)PYRENE BENZO(B)FLUORANTHENE BENZO(G,H,I)PERYLENE BENZO(K)FLUORANTHENE CHRYSENE DIBENZO(A,H)ANTHRACENE INDENO(1,2,3-CD)PYRENE NAPHTHALENE
Groundwater	ALUMINUM DIBENZOFURAN IRON MANGANESE NAPHTHALENE

Note:
COPCs selected per Tables 6-1 through 6-3

FIGURES

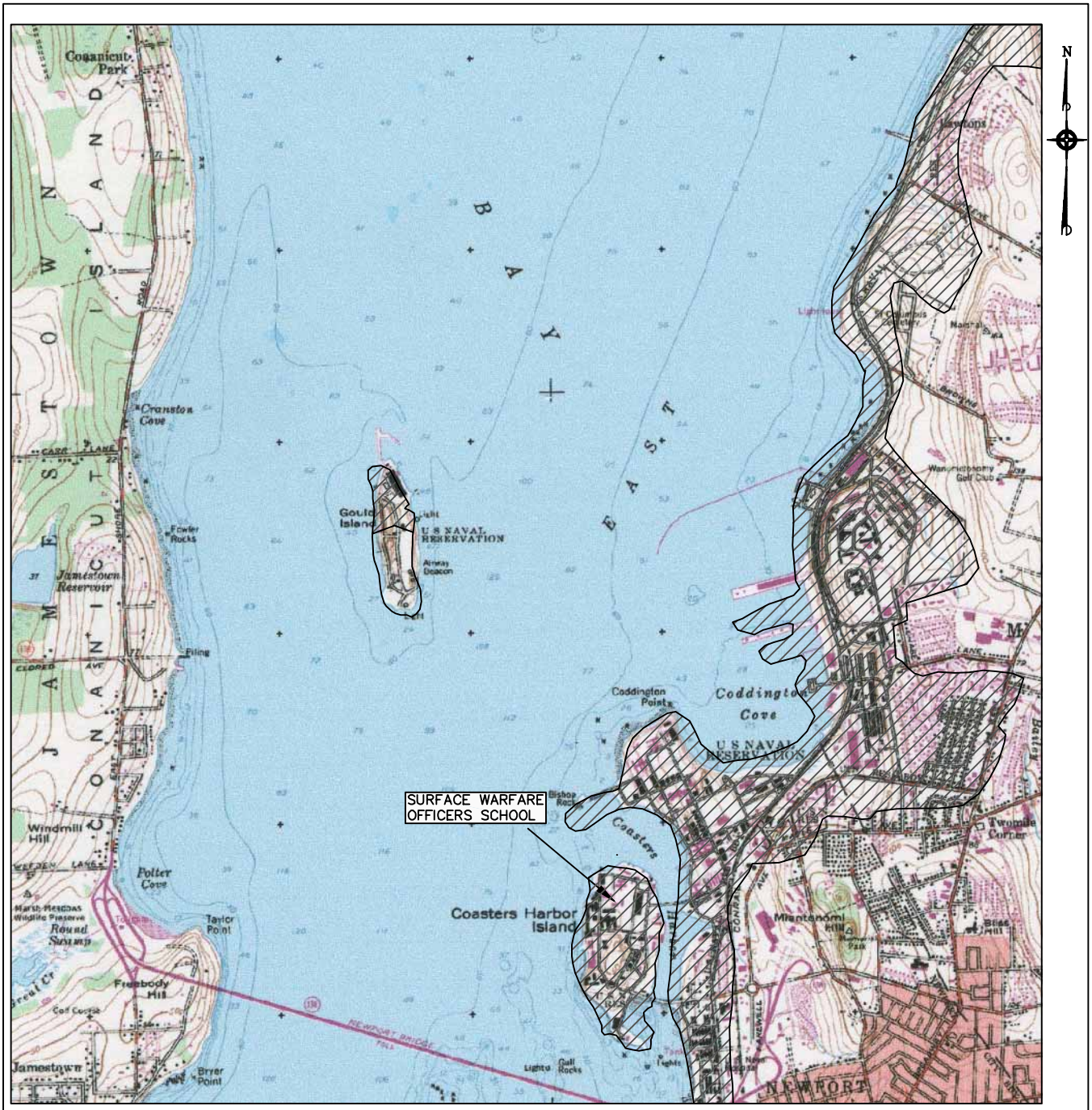
LEGEND

- PETROLEUM HYDROCARBONS PRESENT > 500 mg/kg IN SOIL
- LEAD PRESENT > 150 mg/kg IN SOIL
- FILL PRESENT > 3 FEET BGS
- SITE BOUNDARY LINE
- XX EXISTING CONTOUR
- FENCELINE
- OFF-PZ-XX PIEZOMETER
- SBXX SOIL BORING
- MWXX MONITORING WELL
- HYDRANT
- VALVE
- GAS GATE
- WATER GATE
- LIGHT POST
- UTILITY POLE
- CATCH BASIN
- MANHOLE (TYPE UNKNOWN)
- SEWER MANHOLE
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- HAND HOLE
- TELEPHONE MANHOLE
- CLEAN OUT
- WATER SHUT OFF
- CONCRETE
- ASPH ASHPALT
- BR BIKE RACK
- DI DRAIN INLET
- GRASS

NOTES:

1. BASE MAP FROM A PLAN BY LOUIS FEDERICI & ASSOCIATES, PROVIDENCE, RI, PLS STAMP DATED: 06/10/05, ENTITLED: "SURFACE WARFARE OFFICERS SCHOOL (SWOS) SITE, 2005 - TOPOGRAPHIC SURVEY, SOIL BORINGS, MONITORING WELLS AND FEATURE LOCATION AT THE OLD FIRE FIGHTING TRAINING AREA, NEWPORT NAVAL BASE, IN NEWPORT, RHODE ISLAND FOR TETRA TECH NUS, INC.", ORIGINAL SCALE: 1"=50 FT., PLAN DATUM HORIZONTAL: NAD 83 (FEET), VERTICAL: NAVAL BASE MEAN LOW WATER.
2. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.
3. PLAN NOT TO BE USED FOR DESIGN.

SUMMARY OF FINDINGS			FIGURE E-1
FOCUSED SITE INSPECTION FOR SURFACE WARFARE OFFICERS SCHOOL			TETRA TECH NUS, INC.
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND			55 Jonspin Road Wilmington, MA 01887 (978)658-7899
DRAWN BY:	D.W. MACDOUGALL	REV.: 0	
CHECKED BY:	L. SEYDEWITZ	DATE: MARCH 7, 2006	
SCALE:	AS NOTED	FILE NO.: I:\5339\0342\FIG_E-1.DWG	



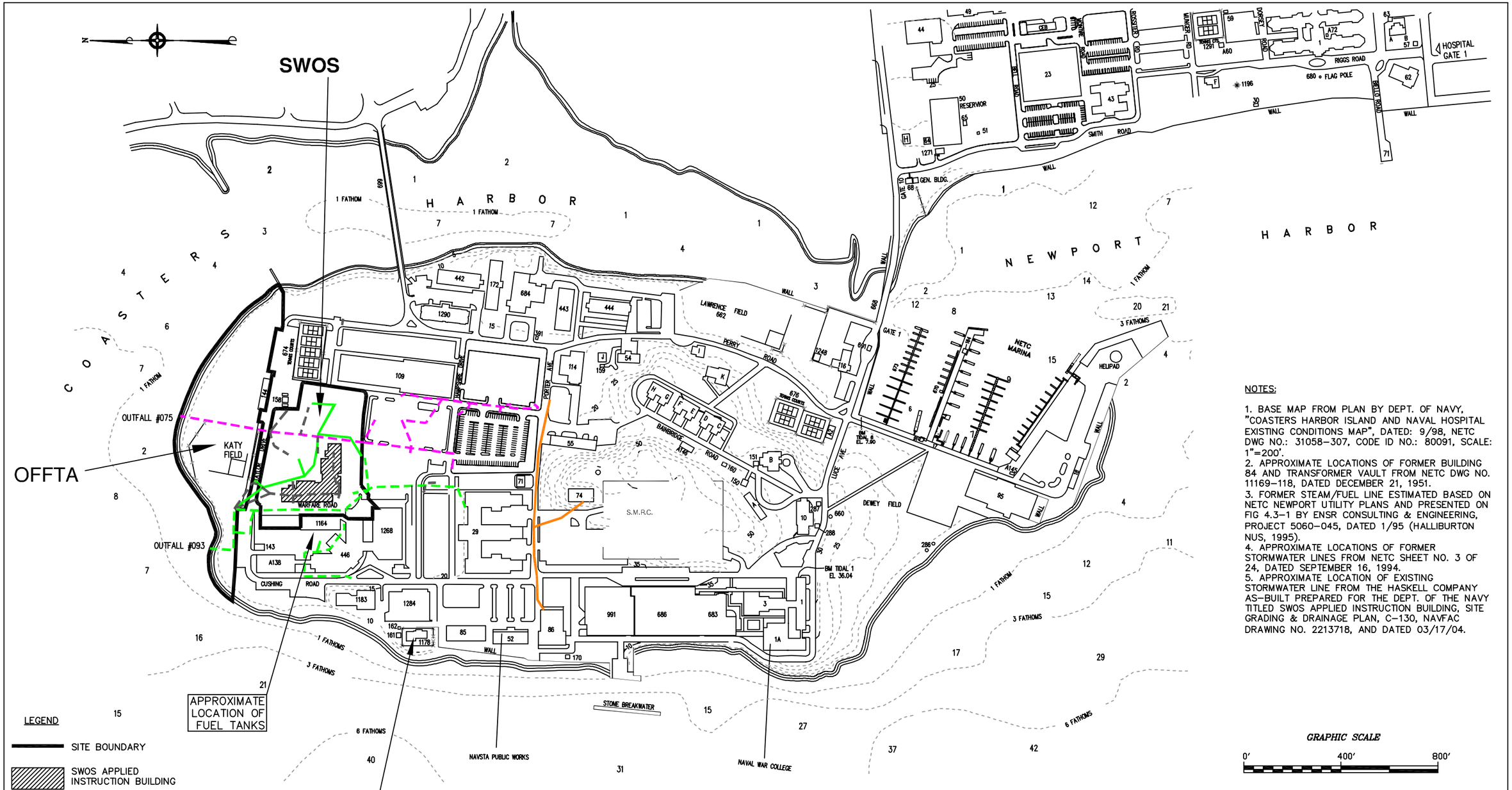
BASE MAP IS A PORTION OF THE FOLLOWING 7.5 X 15 MINUTE U.S.G.S. QUADRANGLE: PRUDENCE ISLAND, RHODE ISLAND, 1955, PHOTOREVISED 1970 AND 1975

NAVAL STATION NEWPORT PROPERTY BOUNDARY

GRAPHIC SCALE
0 0.5 MILE 1 MILE

RI
QUADRANGLE LOCATION

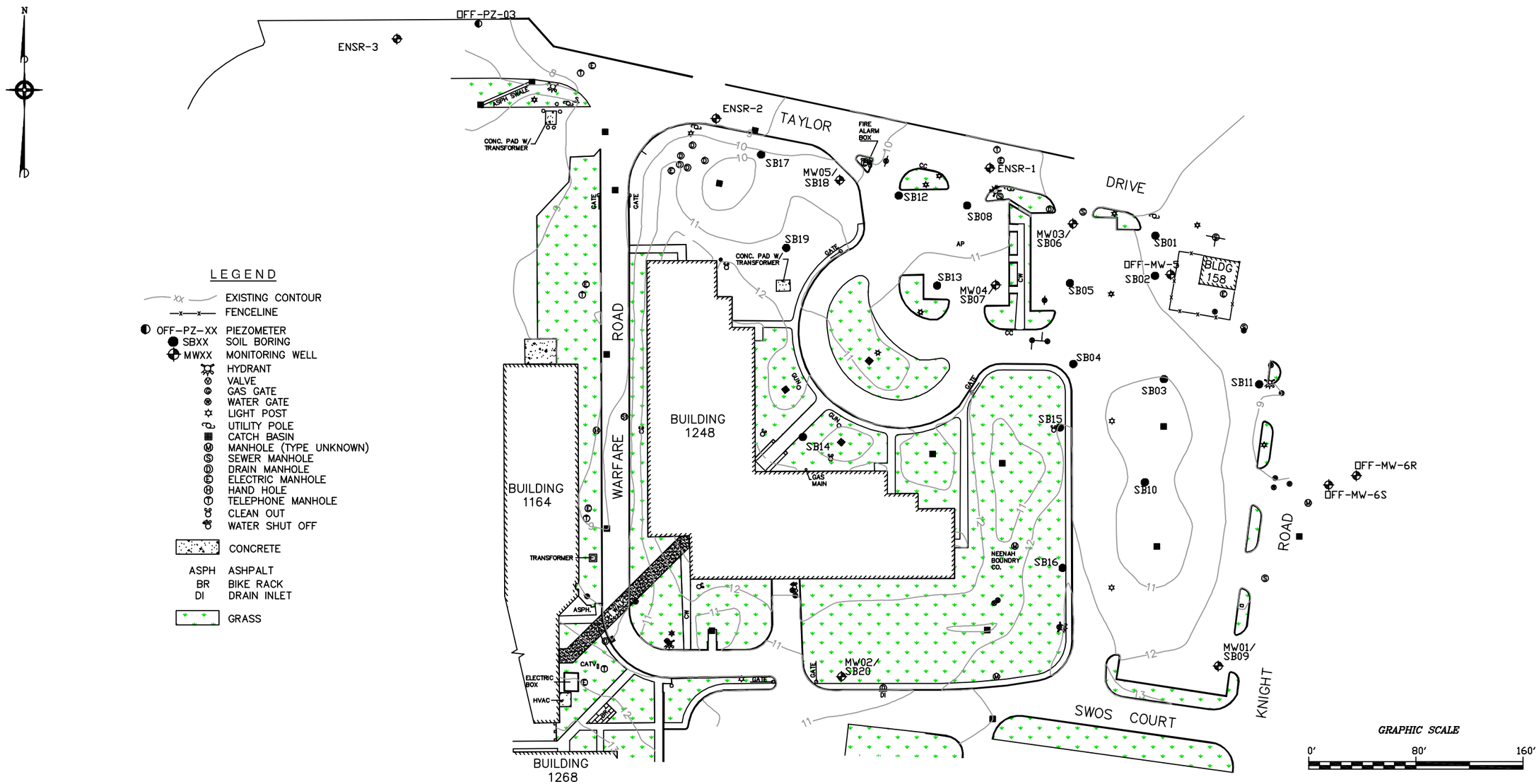
NAVAL STATION NEWPORT LOCATION MAP		FIGURE 1–1	
SURFACE WARFARE OFFICERS SCHOOL		TETRA TECH NUS, INC.	
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND		55 Jonspin Road Wilmington, MA 01887 (978)658–7899	
DRAWN BY: D.W. MACDOUGALL	REV.: 0		
CHECKED BY: L. SEYDEWITZ	DATE: JULY 27, 2005		
SCALE: AS NOTED	ACAD NAME: DWG\5339\0341\FIG_1–1.DWG		



NOTES:

1. BASE MAP FROM PLAN BY DEPT. OF NAVY, "COASTERS HARBOR ISLAND AND NAVAL HOSPITAL EXISTING CONDITIONS MAP", DATED: 9/98, NETC DWG NO.: 31058–307, CODE ID NO.: 80091, SCALE: 1"=200'.
2. APPROXIMATE LOCATIONS OF FORMER BUILDING 84 AND TRANSFORMER VAULT FROM NETC DWG NO. 11169–118, DATED DECEMBER 21, 1951.
3. FORMER STEAM/FUEL LINE ESTIMATED BASED ON NETC NEWPORT UTILITY PLANS AND PRESENTED ON FIG 4.3–1 BY ENSR CONSULTING & ENGINEERING, PROJECT 5060–045, DATED 1/95 (HALLIBURTON NUS, 1995).
4. APPROXIMATE LOCATIONS OF FORMER STORMWATER LINES FROM NETC SHEET NO. 3 OF 24, DATED SEPTEMBER 16, 1994.
5. APPROXIMATE LOCATION OF EXISTING STORMWATER LINE FROM THE HASKELL COMPANY AS–BUILT PREPARED FOR THE DEPT. OF THE NAVY TITLED SWOS APPLIED INSTRUCTION BUILDING, SITE GRADING & DRAINAGE PLAN, C–130, NAVFAC DRAWING NO. 2213718, AND DATED 03/17/04.

SITE LOCUS			FIGURE 1–2
SURFACE WARFARE OFFICERS SCHOOL			TETRA TECH NUS, INC.
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND			55 Jonspin Road Wilmington, MA 01887 (978)658–7899
DRAWN BY: D.W. MACDOUGALL	REV.: 0		
CHECKED BY: L. SEYDEWITZ	DATE: MARCH 15, 2006		
SCALE: AS SHOWN	FILE NO.: DWG\5339\0342\FIG_1–2.DWG		



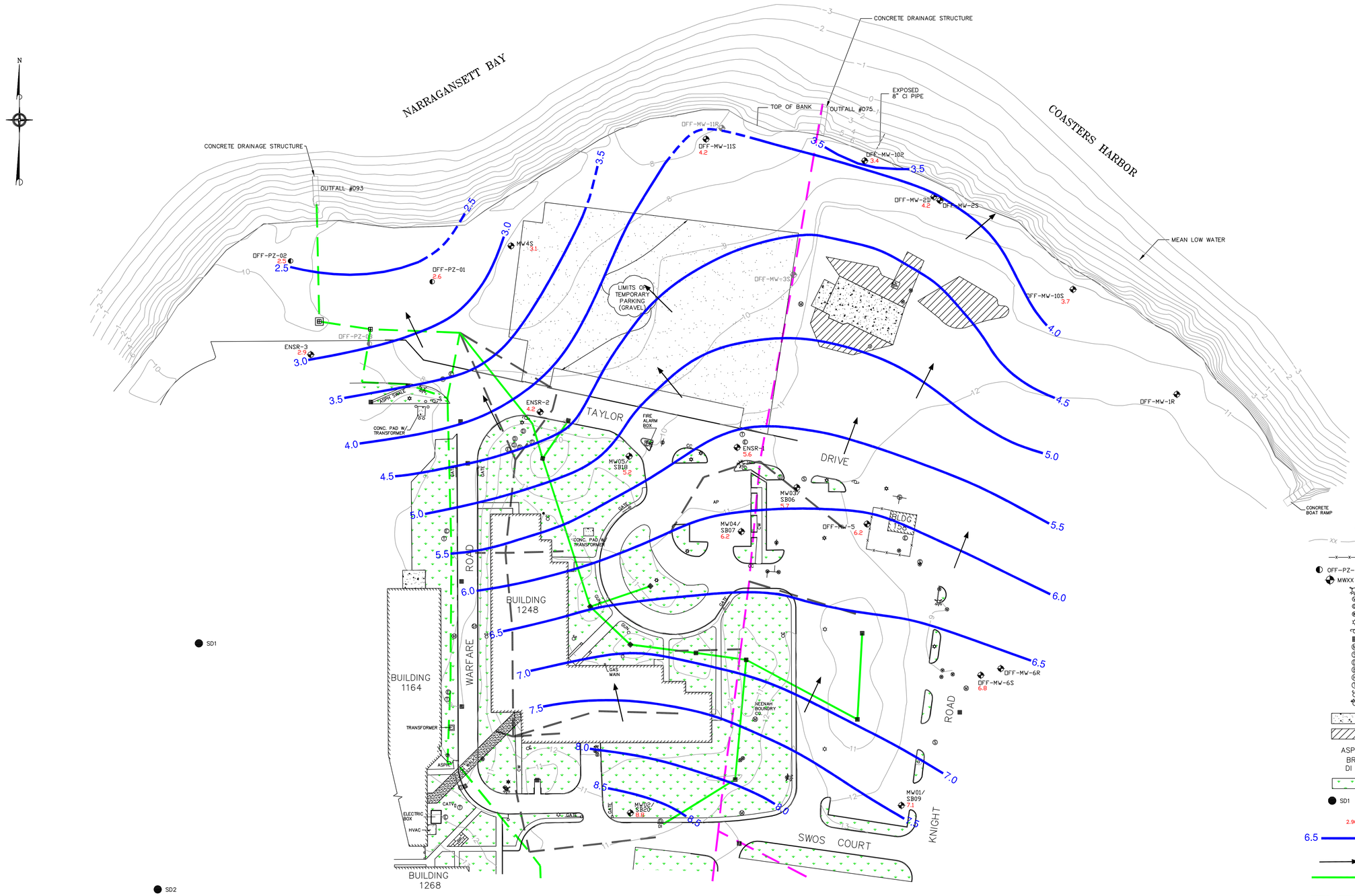
LEGEND

- EXISTING CONTOUR
- FENCELINE
- OFF-PZ-XX PIEZOMETER
- SBXX SOIL BORING
- MWXX MONITORING WELL
- HYDRANT
- VALVE
- GAS GATE
- WATER GATE
- LIGHT POST
- UTILITY POLE
- CATCH BASIN
- MANHOLE (TYPE UNKNOWN)
- SEWER MANHOLE
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- HAND HOLE
- TELEPHONE MANHOLE
- CLEAN OUT
- WATER SHUT OFF
- CONCRETE
- ASPH ASHPALT
- BR BIKE RACK
- DI DRAIN INLET
- GRASS

NOTES:

1. BASE MAP FROM A PLAN BY LOUIS FEDERICI & ASSOCIATES, PROVIDENCE, RI, PLS STAMP DATED: 06/10/05, ENTITLED: "SURFACE WARFARE OFFICERS SCHOOL (SWOS) SITE, 2005 - TOPOGRAPHIC SURVEY, SOIL BORINGS, MONITORING WELLS AND FEATURE LOCATION AT THE OLD FIRE FIGHTING TRAINING AREA, NEWPORT NAVAL BASE, IN NEWPORT, RHODE ISLAND FOR TETRA TECH NUS, INC.", ORIGINAL SCALE: 1"=50 FT., PLAN DATUM HORIZONTAL: NAD 83 (FEET), VERTICAL: NAVAL BASE MEAN LOW WATER.
2. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.
3. PLAN NOT TO BE USED FOR DESIGN.

BASE MAP WITH SAMPLE STATIONS		FIGURE 2-1
FOCUSED SITE INSPECTION FOR SURFACE WARFARE OFFICERS SCHOOL		TETRA TECH NUS, INC.
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND		55 Jonspin Road Wilmington, MA 01887 (978)658-7899
DRAWN BY: D.W. MACDOUGALL	REV.: 0	
CHECKED BY: L. SEYDEWITZ	DATE: MARCH 3, 2006	
SCALE: AS NOTED	FILE NO.: I:\5339\0342\FIG_2-1.DWG	



LEGEND

- EXISTING CONTOUR
- FENCELINE
- OFF-PZ-XX PIEZOMETER
- MWXX MONITORING WELL
- HYDRANT
- VALVE
- GAS GATE
- WATER GATE
- LIGHT POST
- UTILITY POLE
- CATCH BASIN
- MANHOLE (TYPE UNKNOWN)
- SEWER MANHOLE
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- HAND HOLE
- TELEPHONE MANHOLE
- CLEAN OUT
- WATER SHUT OFF
- CONCRETE
- BITUMINOUS PAVEMENT
- ASPH ASHPALT
- BR BIKE RACK
- DI DRAIN INLET
- GRASS
- SD1 ENSR SMALL-DIAMETER MONITORING WELL INSTALLED DURING UST REMEDIAL INVESITGATION
- 2.96 GROUNDWATER ELEVATION (FT NGVD) – (SEE NOTE 1)
- 6.5 APPROXIMATE GROUNDWATER GRADIENT CONTOUR (FT NGVD) DASHED WHERE INFERRED – (SEE NOTE 2)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- EXISTING SWOS STORMWATER LINE LEADING TO OUTFALL #093
- EXISTING STORMWATER LINE LEADING TO OUTFALL #093
- EXISTING STORMWATER LINE LEADING TO OUTFALL #075
- FORMER STORMWATER LINE

GRAPHIC SCALE

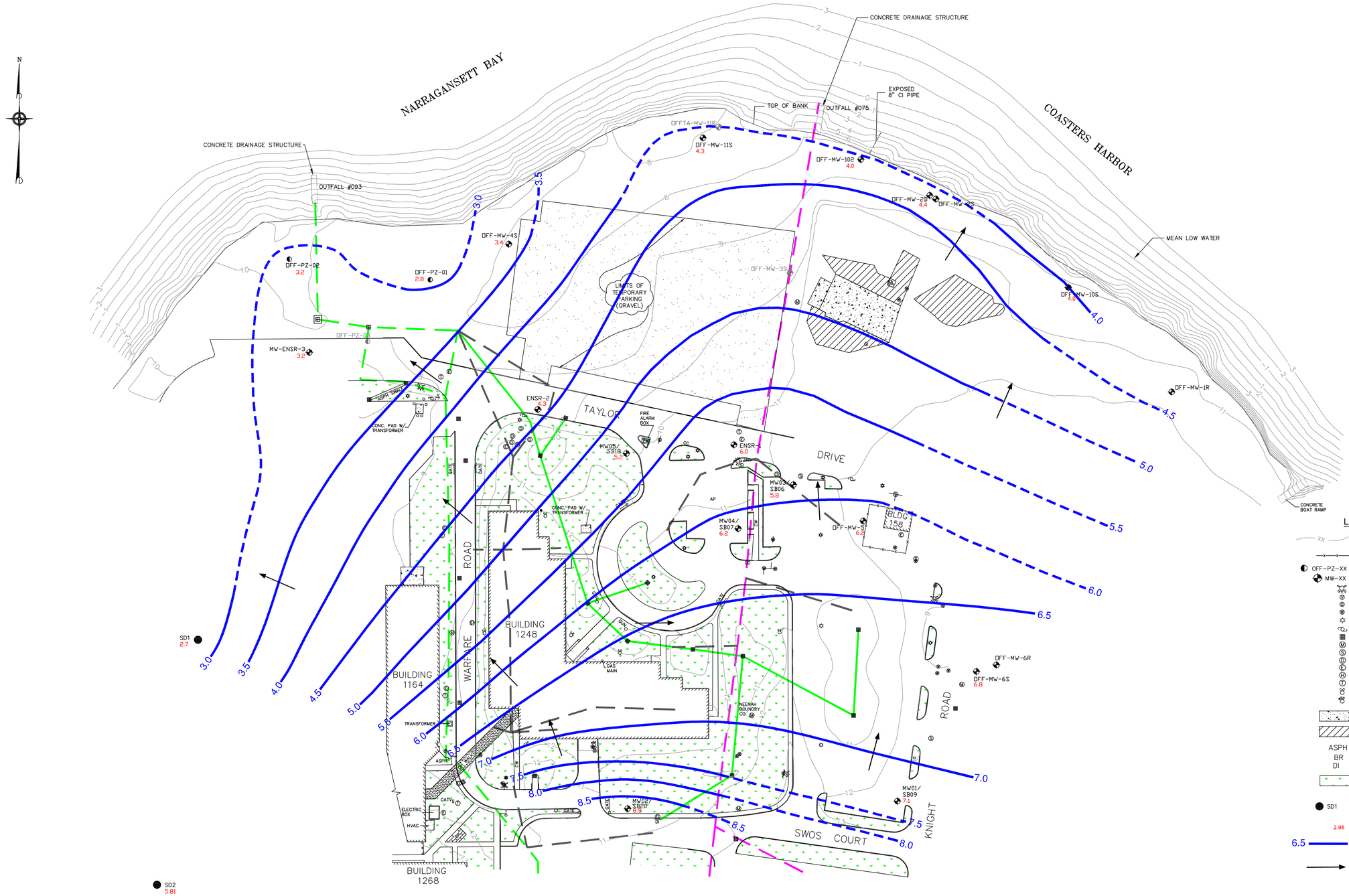
50' 0' 50' 100'

NOTES:

1. BASE MAP FROM A PLAN BY LOUIS FEDERICI & ASSOCIATES, PROVIDENCE, RI, PLS STAMP DATED: 06/10/05, ENTITLED:"SURFACE WARFARE OFFICERS SCHOOL (SWOS) SITE, 2005 – TOPOGRAPHIC SURVEY, SOIL BORINGS, MONITORING WELLS AND FEATURE LOCATION AT THE OLD FIRE FIGHTING TRAINING AREA, NEWPORT NAVAL BASE, IN NEWPORT, RHODE ISLAND FOR TETRA TECH NUS, INC.", ORIGINAL SCALE: 1"=50 FT., PLAN DATUM HORIZONTAL: NAD 83 (FEET), VERTICAL: NAVAL BASE MEAN LOW WATER.
2. GROUNDWATER GRADIENT CONTOURS BASED ON MEASUREMENTS TAKEN DURING THE SYNOPTIC GROUNDWATER MEASUREMENT ROUND CONDUCTED DURING LOW TIDE, JANUARY 24, 2006.
3. MONITORING WELLS OFF-MW-3S AND OFF-MW-111R WERE NOT LOCATED FOR THE JANUARY 2006 SYNOPTIC GROUNDWATER MEASUREMENT ROUND. PIEZOMETER OFF-PZ-03 WAS LOCATED BENEATH 6 INCHES OF WATER AT THE TIME OF THE JANUARY 2006 MEASUREMENT.
4. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.
5. PLAN NOT TO BE USED FOR DESIGN.
6. USE OF MW-2D WAS DEEMED ACCEPTABLE FOR OVERBURDEN AQUIFER MAPPING. WELL IS SCREENED 17-31 bgs, IN SAND/GRAVEL MATRIX.

DRAWN BY: D.W. MACDOUGALL	TITLE: OVERBURDEN GROUNDWATER GRADIENT – LOW TIDE		
PREPARED BY: J. TRAUT	FOCUSED SITE INSPECTION FOR SURFACE WARFARE OFFICERS SCHOOL		
CHECKED BY: R. O'NEILL	NAVSTA NEWPORT – NEWPORT, RHODE ISLAND		
	SOURCE: BASE PLAN BY LOUIS FEDERICI & ASSOCIATES (SEE NOTE 1)		
	SCALE: AS SHOWN	DATE: MARCH 15, 2006	PROJ. NO: 5339
PROJECT MANAGER: S. PARKER	DRAWING NO: 3-1A	ACFILE NAME: I:\5339\0342\OB_GW_LT.DWG	REV: 0
PROGRAM MANAGER: J. TREPANOWSKI			

TETRA TECH NUS, INC.
55 JONSPIN ROAD
WILMINGTON, MASSACHUSETTS 01887
(978)658-7899



LEGEND

- EXISTING CONTOUR
- FENCELINE
- OFF-PZ-XX PIEZOMETER
- MW-XX MONITORING WELL
- HYDRANT
- VALVE
- GAS GATE
- WATER GATE
- LIGHT POST
- UTILITY POLE
- CATCH BASIN
- MANHOLE (TYPE UNKNOWN)
- SEWER MANHOLE
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- HAND HOLE
- TELEPHONE MANHOLE
- CLEAN OUT
- WATER SHUT OFF
- CONCRETE
- BITUMINOUS PAVEMENT
- ASPH ASHPALT
- BR BIKE RACK
- DI DRAIN INLET
- GRASS
- SD1 ENSR SMALL-DIAMETER MONITORING WELL INSTALLED DURING UST REMEDIAL INVESITGATION
- 2.96 GROUNDWATER ELEVATION (FT NGVD) – (SEE NOTE 1)
- 6.5 APPROXIMATE GROUNDWATER GRADIENT CONTOUR (FT NGVD) DASHED WHERE INFERRED – (SEE NOTE 2)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

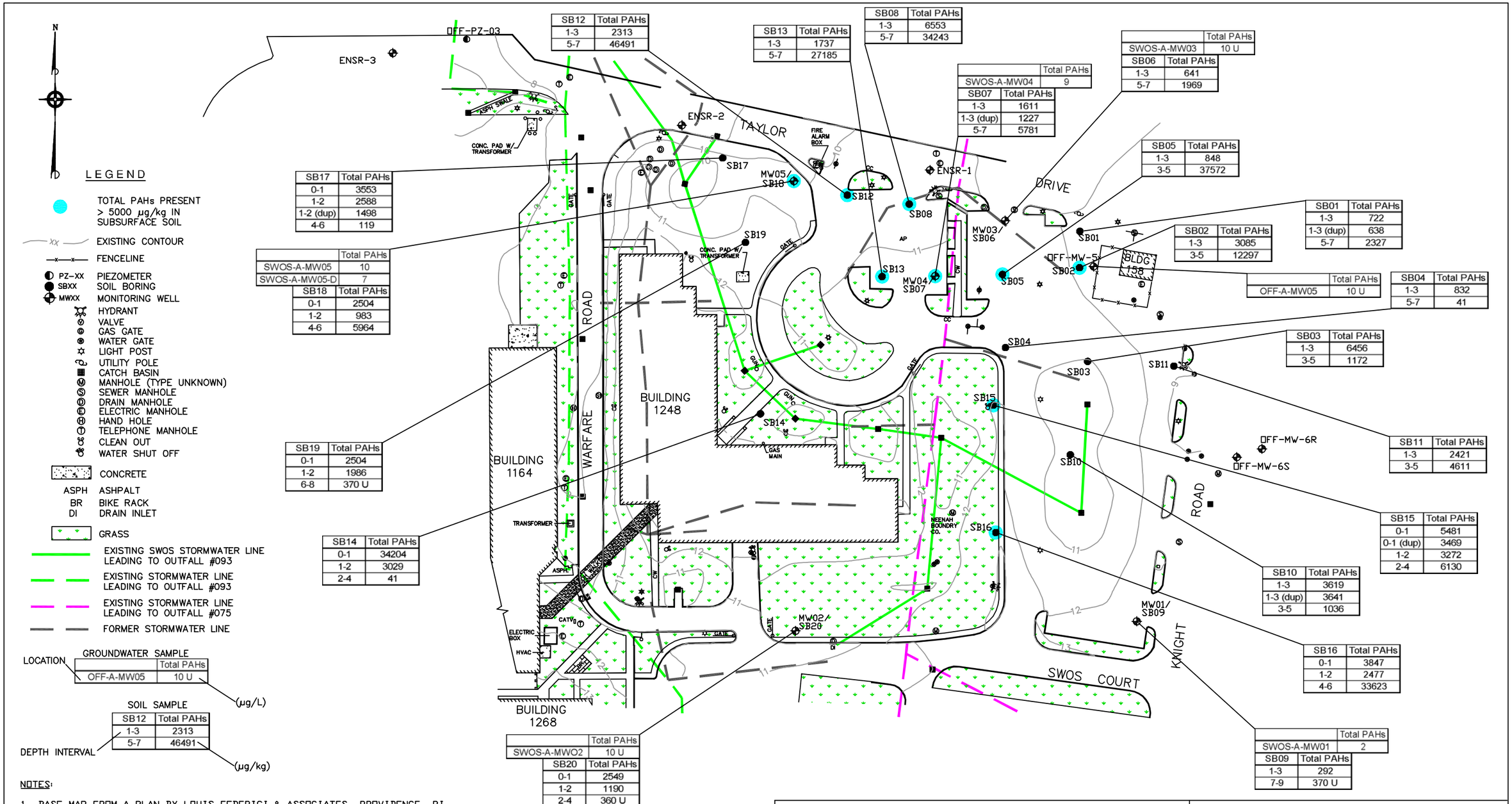
1. BASE MAP FROM A PLAN BY LOUIS FEDERICI & ASSOCIATES, PROVIDENCE, RI, PLS STAMP DATED: 06/10/05, ENTITLED:"SURFACE WARFARE OFFICERS SCHOOL (SWOS) SITE, 2005 – TOPOGRAPHIC SURVEY, SOIL BORINGS, MONITORING WELLS AND FEATURE LOCATION AT THE OLD FIRE FIGHTING TRAINING AREA, NEWPORT NAVAL BASE, IN NEWPORT, RHODE ISLAND FOR TETRA TECH NUS, INC.", ORIGINAL SCALE: 1"=50 FT., PLAN DATUM HORIZONTAL: NAD 83 (FEET), VERTICAL: NAVAL BASE MEAN LOW WATER.
2. GROUNDWATER GRADIENT CONTOURS BASED ON MEASUREMENTS TAKEN DURING THE SYNOPTIC GROUNDWATER MEASUREMENT ROUND CONDUCTED DURING LOW TIDE, JANUARY 24, 2006.
3. MONITORING WELLS OFF-MW-3S AND OFF-MW-111R WERE NOT LOCATED FOR THE JANUARY 2006 SYNOPTIC GROUNDWATER MEASUREMENT ROUND. PIEZOMETER OFF-PZ-03 WAS LOCATED BENEATH 6 INCHES OF WATER AT THE TIME OF THE JANUARY 2006 MEASUREMENT.
4. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.
5. PLAN NOT TO BE USED FOR DESIGN.
6. USE OF MW-2D WAS DEEMED ACCEPTABLE FOR OVERBURDEN AQUIFER MAPPING. WELL IS SCREENED 17-31 bgs, IN SAND/GRAVEL MATRIX.
7. ELEVATION OF WATER LEVEL IN ENSR-1 WAS DETERMINED TO BE ANOMALOUS AND WAS OMITTED FROM THE HIGH TIDE OVERBURDEN GROUNDWATER GRADIENT CONTOUR EVALUATION.

GRAPHIC SCALE

50' 0' 50' 100'

DRAWN BY: D.W. MACDOUGALL	TITLE: OVERBURDEN GROUNDWATER GRADIENT – HIGH TIDE FOCUSED SITE INSPECTION FOR SURFACE WARFARE OFFICERS SCHOOL NAVSTA NEWPORT – NEWPORT, RHODE ISLAND		
PREPARED BY: J. TRAUT			
CHECKED BY: R. O'NEILL			
	SOURCE: BASE PLAN BY LOUIS FEDERICI & ASSOCIATES (SEE NOTE 1)		
	SCALE: AS SHOWN	DATE: MARCH 15, 2006	PROJ. NO: 5339
PROJECT MANAGER: S. PARKER	DRAWING NO: 3-1B	ACFILE NAME: I:\5339\0342\OB_GW_HT.DWG	REV: 0
PROGRAM MANAGER: J. TREPANOWSKI			

TETRA TECH NUS, INC.
55 JONSPIN ROAD
WILMINGTON, MASSACHUSETTS 01887
(978)658-7899



SB12	Total PAHs
1-3	2313
5-7	46491

SB13	Total PAHs
1-3	1737
5-7	27185

SB08	Total PAHs
1-3	6553
5-7	34243

	Total PAHs
SWOS-A-MW04	9

SB07	Total PAHs
1-3	1611
1-3 (dup)	1227
5-7	5781

	Total PAHs
SWOS-A-MW03	10 U

SB06	Total PAHs
1-3	641
5-7	1969

SB05	Total PAHs
1-3	848
3-5	37572

SB01	Total PAHs
1-3	722
1-3 (dup)	638
5-7	2327

SB02	Total PAHs
1-3	3085
3-5	12297

	Total PAHs
OFF-A-MW05	10 U

SB04	Total PAHs
1-3	832
5-7	41

SB03	Total PAHs
1-3	6456
3-5	1172

SB11	Total PAHs
1-3	2421
3-5	4611

SB15	Total PAHs
0-1	5481
0-1 (dup)	3469
1-2	3272
2-4	6130

SB10	Total PAHs
1-3	3619
1-3 (dup)	3641
3-5	1036

SB16	Total PAHs
0-1	3847
1-2	2477
4-6	33623

	Total PAHs
SWOS-A-MW01	2

SB09	Total PAHs
1-3	292
7-9	370 U

SB17	Total PAHs
0-1	3553
1-2	2588
1-2 (dup)	1498
4-6	119

	Total PAHs
SWOS-A-MW05	10
SWOS-A-MW05-D	7

SB18	Total PAHs
0-1	2504
1-2	983
4-6	5964

SB19	Total PAHs
0-1	2504
1-2	1986
6-8	370 U

SB14	Total PAHs
0-1	34204
1-2	3029
2-4	41

	Total PAHs
SWOS-A-MWO2	10 U

SB20	Total PAHs
0-1	2549
1-2	1190
2-4	360 U

NOTES:

1. BASE MAP FROM A PLAN BY LOUIS FEDERICI & ASSOCIATES, PROVIDENCE, RI, PLS STAMP DATED: 06/10/05, ENTITLED: "SURFACE WARFARE OFFICERS SCHOOL (SWOS) SITE, 2005 - TOPOGRAPHIC SURVEY, SOIL BORINGS, MONITORING WELLS AND FEATURE LOCATION AT THE OLD FIRE FIGHTING TRAINING AREA, NEWPORT NAVAL BASE, IN NEWPORT, RHODE ISLAND FOR TETRA TECH NUS, INC.", ORIGINAL SCALE: 1"=50 FT., PLAN DATUM HORIZONTAL: NAD 83 (FEET), VERTICAL: NAVAL BASE MEAN LOW WATER.
2. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.
3. PLAN NOT TO BE USED FOR DESIGN.
4. TOTAL PAH CONCENTRATIONS ARE SUMS OF INDIVIDUAL PAH CONCENTRATIONS, SOME OF WHICH MAY BE APPROXIMATE (J).

GRAPHIC SCALE

0' 80' 160'

TOTAL PAHs IN SOIL AND GROUNDWATER SAMPLES

FOCUSED SITE INSPECTION FOR SURFACE WARFARE OFFICERS SCHOOL

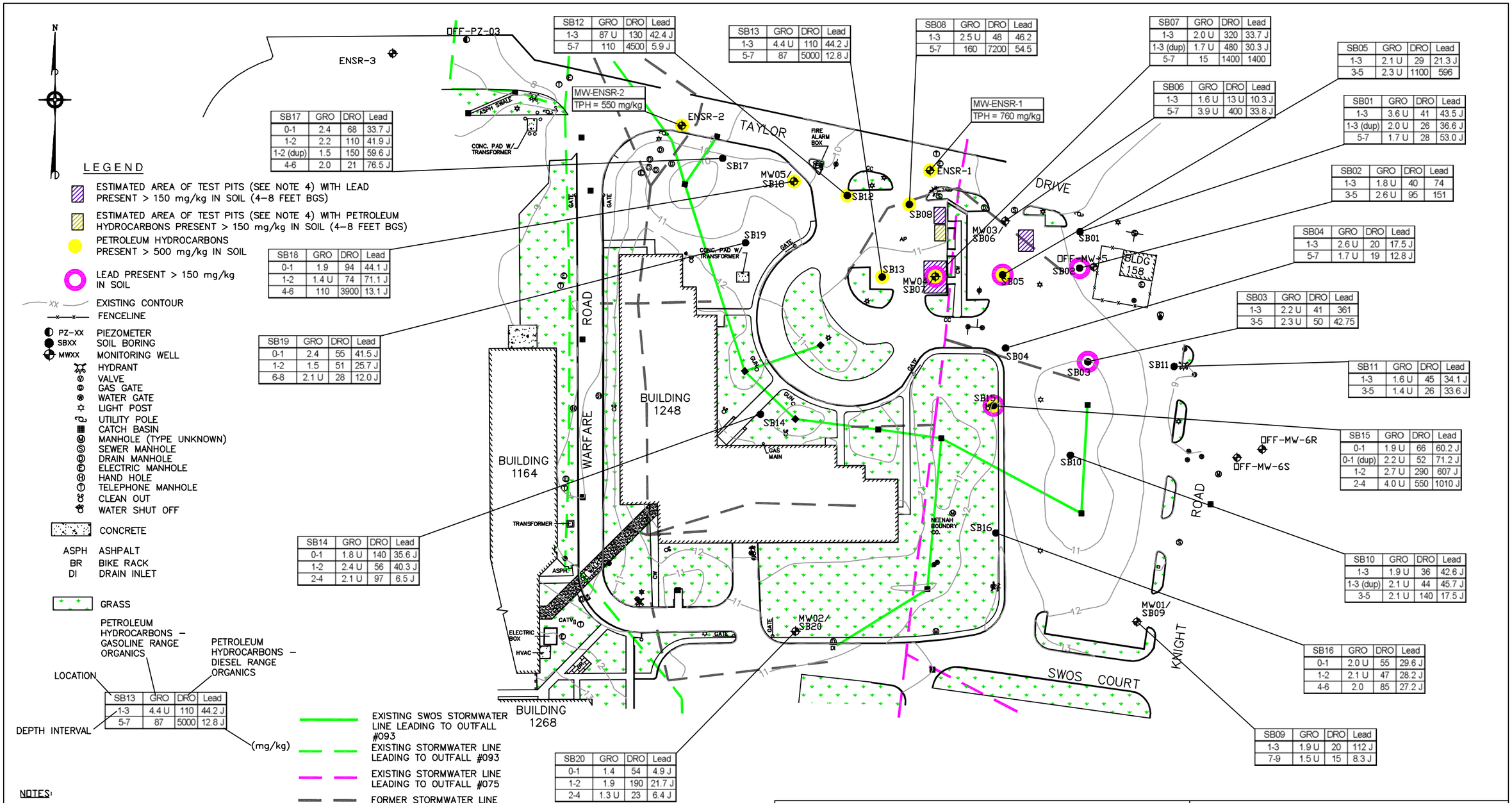
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND

DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	L. SEYDEWITZ	DATE:	MARCH 7, 2006
SCALE:	AS NOTED	FILE NO.:	I:\5339\0342\FIG_4-1.DWG

FIGURE 4-1

TETRA TECH NUS, INC.

55 Jonspin Road Wilmington, MA 01887
(978)658-7899



SB12	GRO	DRO	Lead
1-3	87 U	130	42.4 J
5-7	110	4500	5.9 J

SB13	GRO	DRO	Lead
1-3	4.4 U	110	44.2 J
5-7	87	5000	12.8 J

SB08	GRO	DRO	Lead
1-3	2.5 U	48	46.2
5-7	160	7200	54.5

SB07	GRO	DRO	Lead
1-3	2.0 U	320	33.7 J
1-3 (dup)	1.7 U	480	30.3 J
5-7	15	1400	1400

SB05	GRO	DRO	Lead
1-3	2.1 U	29	21.3 J
3-5	2.3 U	1100	596

SB06	GRO	DRO	Lead
1-3	1.6 U	13 U	10.3 J
5-7	3.9 U	400	33.8 J

SB01	GRO	DRO	Lead
1-3	3.6 U	41	43.5 J
1-3 (dup)	2.0 U	26	36.6 J
5-7	1.7 U	28	53.0 J

SB17	GRO	DRO	Lead
0-1	2.4	68	33.7 J
1-2	2.2	110	41.9 J
1-2 (dup)	1.5	150	59.6 J
4-6	2.0	21	76.5 J

SB02	GRO	DRO	Lead
1-3	1.8 U	40	74
3-5	2.6 U	95	151

SB04	GRO	DRO	Lead
1-3	2.6 U	20	17.5 J
5-7	1.7 U	19	12.8 J

SB18	GRO	DRO	Lead
0-1	1.9	94	44.1 J
1-2	1.4 U	74	71.1 J
4-6	110	3900	13.1 J

SB03	GRO	DRO	Lead
1-3	2.2 U	41	361
3-5	2.3 U	50	42.75

SB19	GRO	DRO	Lead
0-1	2.4	55	41.5 J
1-2	1.5	51	25.7 J
6-8	2.1 U	28	12.0 J

SB11	GRO	DRO	Lead
1-3	1.6 U	45	34.1 J
3-5	1.4 U	26	33.6 J

SB15	GRO	DRO	Lead
0-1	1.9 U	66	60.2 J
0-1 (dup)	2.2 U	52	71.2 J
1-2	2.7 U	290	607 J
2-4	4.0 U	550	1010 J

SB14	GRO	DRO	Lead
0-1	1.8 U	140	35.6 J
1-2	2.4 U	56	40.3 J
2-4	2.1 U	97	6.5 J

SB10	GRO	DRO	Lead
1-3	1.9 U	36	42.6 J
1-3 (dup)	2.1 U	44	45.7 J
3-5	2.1 U	140	17.5 J

SB16	GRO	DRO	Lead
0-1	2.0 U	55	29.6 J
1-2	2.1 U	47	28.2 J
4-6	2.0	85	27.2 J

SB13	GRO	DRO	Lead
1-3	4.4 U	110	44.2 J
5-7	87	5000	12.8 J

SB09	GRO	DRO	Lead
1-3	1.9 U	20	112 J
7-9	1.5 U	15	8.3 J

SB20	GRO	DRO	Lead
0-1	1.4	54	4.9 J
1-2	1.9	190	21.7 J
2-4	1.3 U	23	6.4 J

NOTES:

1. BASE MAP FROM A PLAN BY LOUIS FEDERICI & ASSOCIATES, PROVIDENCE, RI, PLS STAMP DATED: 06/10/05, ENTITLED: 'SURFACE WARFARE OFFICERS SCHOOL (SWOS) SITE, 2005 – TOPOGRAPHIC SURVEY, SOIL BORINGS, MONITORING WELLS AND FEATURE LOCATION AT THE OLD FIRE FIGHTING TRAINING AREA, NEWPORT NAVAL BASE, IN NEWPORT, RHODE ISLAND FOR TETRA TECH NUS, INC.', ORIGINAL SCALE: 1"=50 FT., PLAN DATUM HORIZONTAL: NAD 83 (FEET), VERTICAL: NAVAL BASE MEAN LOW WATER.
2. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.
3. PLAN NOT TO BE USED FOR DESIGN.
4. FINAL REPORT AND RISK ASSESSMENT FOR WORKER EXPOSURE AT THE SWOS SITE, FOSTER WHEELER ENVIRONMENTAL CORPORATION, 2003.

DRO/GRO & LEAD IN SOIL SAMPLES

FOCUSED SITE INSPECTION FOR SURFACE WARFARE OFFICERS SCHOOL

NAVSTA NEWPORT – NEWPORT, RHODE ISLAND

DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	L. SEYDEWITZ	DATE:	MARCH 7, 2006
SCALE:	AS NOTED	FILE NO.:	DWG\5339\0342\FIG_4-2.DWG

FIGURE 4–2

TETRA TECH NUS, INC.

55 Jonspin Road Wilmington, MA 01887
(978)658–7899

LEGEND

- PETROLEUM HYDROCARBONS PRESENT > 500 mg/kg IN SOIL
- LEAD PRESENT > 150 mg/kg IN SOIL
- FILL PRESENT > 3 FEET BGS
- SITE BOUNDARY LINE
- EXISTING CONTOUR
- FENCELINE
- OFF-PZ-XX PIEZOMETER
- SBXX SOIL BORING
- MWXX MONITORING WELL
- HYDRANT
- VALVE
- GAS GATE
- WATER GATE
- LIGHT POST
- UTILITY POLE
- CATCH BASIN
- MANHOLE (TYPE UNKNOWN)
- SEWER MANHOLE
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- HAND HOLE
- TELEPHONE MANHOLE
- CLEAN OUT
- WATER SHUT OFF
- CONCRETE
- ASPH ASHPALT
- BR BIKE RACK
- DI DRAIN INLET
- GRASS

NOTES:

1. BASE MAP FROM A PLAN BY LOUIS FEDERICI & ASSOCIATES, PROVIDENCE, RI, PLS STAMP DATED: 06/10/05, ENTITLED: "SURFACE WARFARE OFFICERS SCHOOL (SWOS) SITE, 2005 - TOPOGRAPHIC SURVEY, SOIL BORINGS, MONITORING WELLS AND FEATURE LOCATION AT THE OLD FIRE FIGHTING TRAINING AREA, NEWPORT NAVAL BASE, IN NEWPORT, RHODE ISLAND FOR TETRA TECH NUS, INC.", ORIGINAL SCALE: 1"=50 FT., PLAN DATUM HORIZONTAL: NAD 83 (FEET), VERTICAL: NAVAL BASE MEAN LOW WATER.
2. ALL LOCATIONS ARE TO BE CONSIDERED APPROXIMATE.
3. PLAN NOT TO BE USED FOR DESIGN.

DISTRIBUTION OF FILL IN SOIL SAMPLES			FIGURE 4-3
FOCUSED SITE INSPECTION FOR SURFACE WARFARE OFFICERS SCHOOL			TETRA TECH NUS, INC.
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND			55 Jonspin Road Wilmington, MA 01887 (978)658-7899
DRAWN BY: D.W. MACDOUGALL		REV.: 0	
CHECKED BY: L. SEYDEWITZ		DATE: MARCH 7, 2006	
SCALE: AS NOTED		FILE NO.: I:\5339\0342\FIG_4-3.DWG	

APPENDIX A

SITE PHOTOGRAPHS

Pile of fill containing construction debris, metal, and wood fragments located east of the SWOS Applied Instruction Building. (Site Reconnaissance – March 2004)

Pre-landscaping conditions present south of the SWOS Applied Instruction Building. (Site Reconnaissance – March 2004)

SWOS Applied Instruction Building. (Focused Site Inspection – March 2005)

Direct Push Drilling of soil boring location SB12 situated south of Taylor Drive and in the parking lot north of the SWOS Applied Instruction Building. (Focused Site Inspection – March 2005)

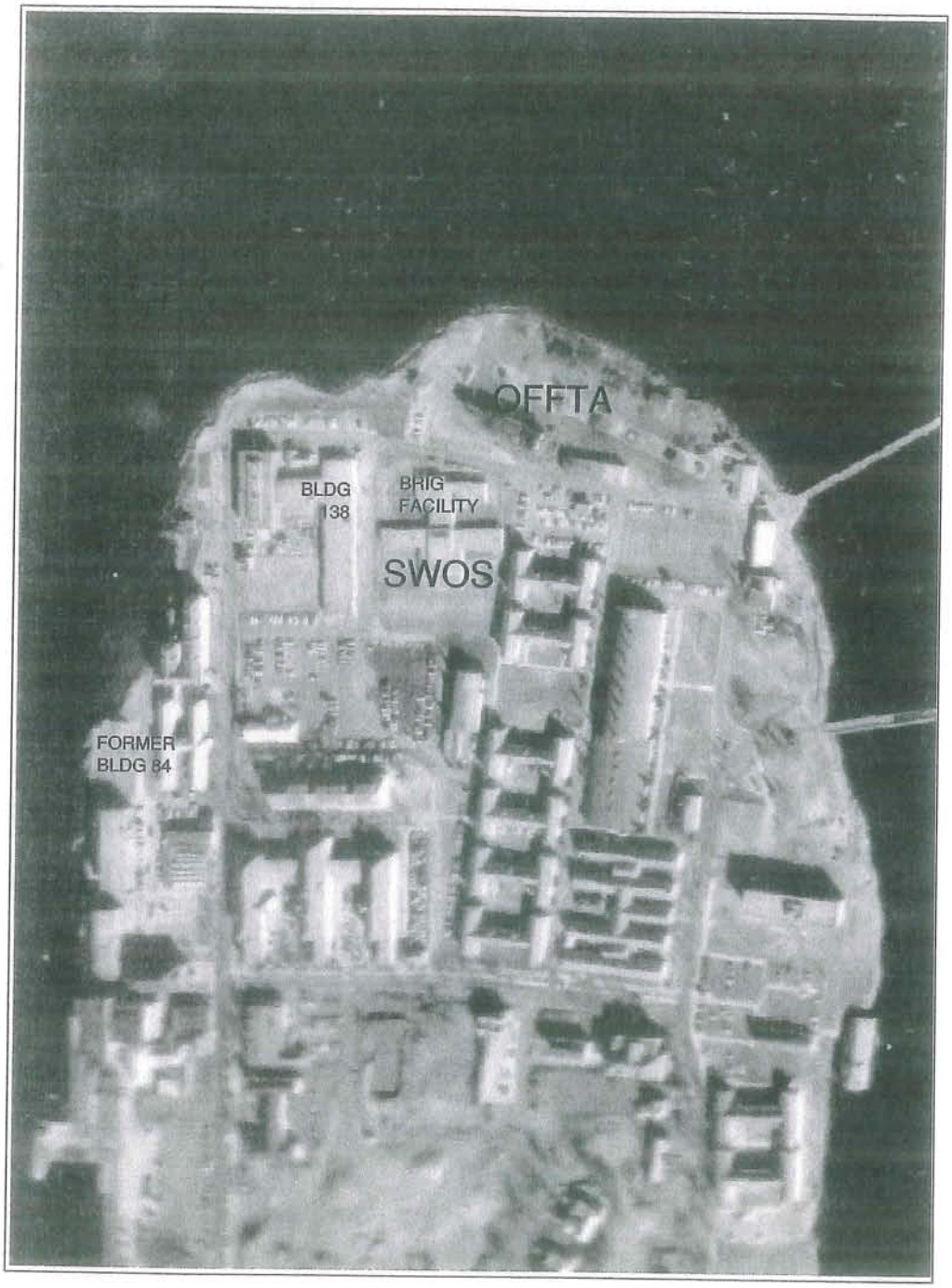
Open acetate sleeve showing the 3-5 foot interval from soil boring location SB07. Fill including brick, concrete and possible asbestos containing material is present. (Focused Site Inspection – March 2005)

Open acetate sleeve showing the 10-12 foot interval from soil boring location SB18. NAPL observed at top of sleeve and in fractures; staining is evident. (Focused Site Inspection – March 2005)

NAPL, determined to contain petroleum components typical of diesel fuel, is visible in the open acetate sleeve of the 10-12 foot interval from soil boring location SB18. (Focused Site Inspection – March 2005)

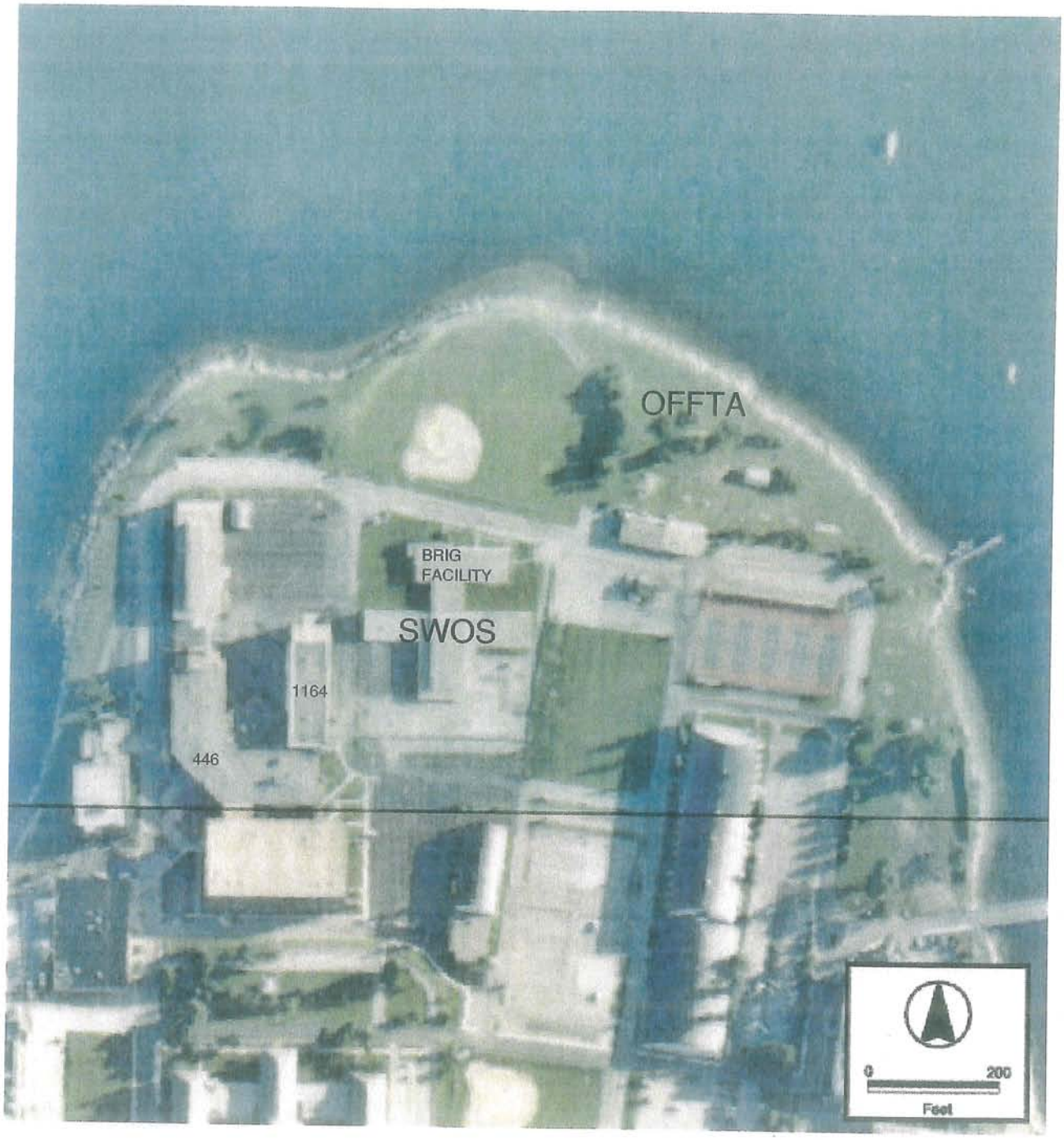
SOURCE:
NS NEWPORT NEWPORT, RHODE ISLAND, RELEASE 4.1, JANUARY 2004

AERIAL PHOTOGRAPH – 1944			FIGURE 2–4
SURFACE WARFARE OFFICERS SCHOOL			TETRA TECH NUS, INC.
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND			55 Jonspin Road Wilmington, MA 01887 (978)658–7899
DRAWN BY: D.W. MACDOUGALL	REV.: 0		
CHECKED BY: L. SEYDEWITZ	DATE: JANUARY 12, 2005		
SCALE: NONE	ACAD NAME: DWG\5152\0442\FIG_2–4.DWG		



SOURCE:
NS NEWPORT NEWPORT, RHODE ISLAND, RELEASE 4.1, JANUARY 2004

AERIAL PHOTOGRAPH – 1962			FIGURE 2–5
SURFACE WARFARE OFFICERS SCHOOL			TETRA TECH NUS, INC.
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND			55 Jonspin Road Wilmington, MA 01887 (978)658–7899
DRAWN BY: D.W. MACDOUGALL	REV.: 0		
CHECKED BY: L. SEYDEWITZ	DATE: JANUARY 12, 2005		
SCALE: NONE	ACAD NAME: DWG\5152\0442\FIG_2–5.DWG		



SOURCE:
NS NEWPORT NEWPORT, RHODE ISLAND, RELEASE 4.1, JANUARY 2004

AERIAL PHOTOGRAPH – 1996	FIGURE 2–6
SURFACE WARFARE OFFICERS SCHOOL	TETRA TECH NUS, INC.
NAVSTA NEWPORT – NEWPORT, RHODE ISLAND	55 Jonspin Road Wilmington, MA 01887 (978)658–7899

DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	L. SEYDEWITZ	DATE:	JANUARY 12, 2005
SCALE:	AS NOTED	ACAD NAME:	DWG\5152\0442\FIG_2–6.DWG

APPENDIX B

GEOLOGIC AND HYDROGEOLOGIC DOCUMENTATION

APPENDIX B1

SOIL BORING SAMPLE SUMMARY
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

Soil Boring Number	Boring Depth (ft. bgs)	Depth of Fill (ft. bgs)	Sample Number	Sample Depth (ft. bgs)	FID Headspace (ppm)	PID Headspace (ppm)	Notes
SB01	11 (5 feet below water table)	0-7	SWOS-S-SB01-0103	1-3	0.0	0.0	Water table at 6.5 ft. bgs
			SWOS-S-DUP01	1-3	N/A	N/A	
			SWOS-S-SB01-0507	5-7	39.5	1.0	
SB02	11 (5 feet below water table)	0-6.2	SWOS-S-SB02-0103	1-3	0.0	0.3	Possible till at 9 ft. bgs
			SWOS-S-SB02-0305	3-5	0.0	0.3	Water table at 5 ft. bgs
SB03	11 (5 feet below water table)	0-3	SWOS-S-SB03-0103	1-3	0.0	0.0	Water table at 3-4 ft. bgs
			SWOS-S-SB03-0305	3-5	0.0	1.0	Possible till at 7 ft. bgs
SB04	11 (5 feet below water table)	0-6	SWOS-S-SB04-0103	1-3	0.0	2.0	Water table at 5-6 ft. bgs
			SWOS-S-SB04-0507	5-7	18.5	3.8	Odor noted 7-11 ft. bgs (EOB)
SB05	14.7 (refusal)	0-5	SWOS-S-SB05-0103	1-3	5.8	9.7	Water table at 5 ft. bgs
			SWOS-S-SB05-0305	3-5	236.7	86.6	Possible till at 7 ft. bgs
SB06	11 (5 feet below water table)	0-5	SWOS-S-SB06-0103	1-3	0.0	10.0	Water table at 5-5.5 ft. bgs
			SWOS-S-SB06-0507	5-7	45.9	189.6	Pet.odor noted 7-11 ft. bgs
SB07	11 (5 feet below water table)	0-5	SWOS-S-SB07-0103	1-3	0.0	0.7	Water table at 5 ft. bgs
			SWOS-S-DUP02	1-3	N/A	N/A	Pet. odor noted 7-11 ft. bgs
			SWOS-S-SB07-0305	3-5	64.5	32.1	Possible NAPL noted 9-11 ft. bgs (EOB)
SB08	9 (refusal)	0-5	SWOS-S-SB08-0103	1-3	7.8	0.5	Water table at 5 ft. bgs
			SWOS-S-SB08-0507	5-7	932.0	37.0	Odor, staining, sheen noted 3.5-8 ft. bgs
SB09	8.5 (refusal)	0-2	SWOS-S-SB09-0103	1-3	0.0	2.3	Till at 6-8.5 ft. bgs (refusal)
			SWOS-S-SB09-0709	7-9	182.9	58.6	Oxidation staining noted 7-8.5 ft. bgs
SB10	11 (5 feet below water table)	0-5.5	SWOS-S-SB10-0103	1-3	47.9	2.3	Water table at 5 ft. bgs
			SWOS-S-DUP03	1-3	N/A	N/A	Till at 8-11 ft. bgs
			SWOS-S-SB10-0305	3-5	21.2	2.0	
SB11	6 (refusal)	0-1	SWOS-S-SB11-0103	1-3	29.9	10.0	Possible conglomerate at 6 ft. bgs
			SWOS-S-SB11-0305	3-5	40.6	28.5	Water table not encountered in overburden
SB12	9 (refusal)	0-1.2 (possibly 0.5)	SWOS-S-SB12-0103	1-3	NR	NR	Pet. odor, staining noted 5 ft. bgs, water table 5-5.5 ft. bgs
			SWOS-S-SB12-0507	5-7	NR	NR	Till at 7-9 ft. bgs (refusal)
SB13	11 (5 feet below water table)	0-5.5	SWOS-S-SB13-0103	1-3	40.9	5.4	Water table at 4.5-5 ft. bgs
			SWOS-S-SB13-0507	5-7	1922.0	133.0	Odor, staining, sheen noted 6-11 ft. bgs
SB14	8.5 (refusal)	0-3	SWOS-S-SB14-0001	0-1	0.2	0.9	Non-woven geotextile at 3 ft. bgs
			SWOS-S-SB14-0102	1-2	569.0	58.9	Water table at 7 ft. bgs
			SWOS-S-SB14-0204	2-4	622.0	71.3	Possible top of bedrock 8.5 ft. bgs

APPENDIX B1

SOIL BORING SAMPLE SUMMARY
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

Soil Boring Number	Boring Depth (ft. bgs)	Depth of Fill (ft. bgs)	Sample Number	Sample Depth (ft. bgs)	FID Headspace (ppm)	PID Headspace (ppm)	Notes
SB15	10 (4 feet below water table)	0-8	SWOS-S-SB15-0001	0-1	89.2	46.7	Water table at 6 ft. bgs
			SWOS-S-DUP04	0-1	N/A	N/A	
			SWOS-S-SB15-0102	1-2	1441.0	327.0	
			SWOS-S-SB15-0204	2-4	302.0	131.0	
SB16	10 (5 feet below water table)	0-10	SWOS-S-SB16-0001	0-1	52.6	34.8	Water table at 5.5-6 ft. bgs
			SWOS-S-SB16-0102	1-2	664.0	52.6	Possible till at 7 ft. bgs
			SWOS-S-SB16-0406	4-6	161.6	84.4	
SB17	12 (5 feet below water table)	0-6.5	SWOS-S-SB17-0001	0-1	11.3	22.1	Water table at 6 ft. bgs
			SWOS-S-SB17-0102	1-2	18.6	14.7	Possible till at 6.3 ft. bgs
			SWOS-S-DUP05	1-2	N/A	N/A	
			SWOS-S-SB17-0406	4-6	185.0	163.0	
SB18	12 (refusal)	0-4	SWOS-S-SB18-0001	0-1	86.1	74.6	Water table at 5-5.5 ft. bgs
			SWOS-S-SB18-0102	1-2	6.0	13.1	Pet. odor, staining at 6 ft. bgs and in weather bedrock
			SWOS-S-SB18-0406	4-6	50.2	406.7	Possible top of weathered bedrock 7 ft. bgs
SB19	10 (refusal)	0-6	SWOS-S-SB19-0001	0-1	13.3	44.3	Water table at 6.5-7 ft. bgs
			SWOS-S-SB19-0102	1-2	68.2	75.6	Possible till at 8 ft. bgs
			SWOS-S-SB19-0608	6-8	2.8	6.8	
SB20	10 (refusal)	0-3	SWOS-S-SB20-0001	0-1	0.1	4.5	Water table at 5-6 ft. bgs
			SWOS-S-SB20-0102	1-2	0.4	3.6	Possible till at 5 ft. bgs
			SWOS-S-SB20-0204	2-4	0.0	0.8	

ppm - parts per million
ft. bgs - feet below ground surface
NR - Not Recorded
N/A - Not Applicable
EOB - End of Boring

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB01
START DATE: 3/15/05
COMPLETION: DATE:
MON. WELL NO.:
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE				
		2.4	SWOS-S-SB01-0103 DUP01 @ 0815 0822			REDDISH-BROWN GRAY	2" ASPHALT. SILTY, F-M SAND, TR. GRAVEL ROADBASE.	FILL SOIL		PID	FID
2							SILTY, F-C SAND, SOME SUBANG. PAVEMENT GRAVEL		DAMP.	0	0
		3.0				GRAY					
4		2.0	SB01-0305							0	0
		2.0	@ 0822			3" BLACK GRAY/BROWN					
6		2.0	SB01-0507						MOIST	1.0	39.5
		2.0	@ 0825	▽					SATURATED @ 6.5' BGS		
8		1.9	SB01-0709			DARK GRAY	F-C SAND, TR. SILT, TRACE FINE ROUNDED GRAVEL	SW		0.4	57.3
		2.0	@ 0830			TO OLIVE GRAY	SILTY FINE SAND. TRACE COARSE ANG. SAND SOME F-C SUBANG. GRAVEL.	SM			
10		1.2	SB01-0911							0.4	23.1
11		2.0	@ 0835								
							EOB @ 11' BGS. ~5'				
							RIZON ▽				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:

ELEVATION FROM:

BORING NO.: SB02
START DATE: 3/15/05
COMPLETION: DATE: 3/15/05
MON. WELL NO.: NA
CHECKED BY:

DEPTH (FEET) 0	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION ASPHALT SURFACE	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
1						BLACK	2" ASPHALT.				
						BROWN	FILL/ROAD BASE SAND & GRAVEL - MOIST				
2		2.0	SWOS-S-SB02-0103 @0905			BROWN	SILTY F-M POORLY (GRADED) SAND. SOME			0.3	0.0
3		2.0	MS/MSD			GRAY	PYRITE/LITE GRAVEL (ANG.) TRACE FINE BRICK & BLACK LOOSE ASPHALT DEBRIS.				
4		1.0	- SB02-0305 @ 0910			YELLOW FINE BRICK				0.3	0.0
5		2.0		▽		MAY X(B) REDDISH	-INC. MORE FINE BRICK? FRAGS & METAL (SHEET)				
6		1.5	SB02-0507	ND		GRAY & BLACK			WATER VOA BROKE	0.4	0.0
7		2.0	@ 0915				S-3A=.2' SIMILAR TO ABOVE.		POST SAMPLE DIST.		
8		1.8	SB02-0709			OLIVE BROWN	S-3B=1.3' FINE SANDY SILT. TRACE CLAY. FINE-MED SAND. TRACE SILT, TRACE ROUND FINE GRAVEL.			0.3	0.0
9		2.0	@ 0920								
10		1.8	SB02-0911				FINE-MED SANDY SILT. SOME F-C SUBROUNDED-SUBANG. GRAVEL.		POSS. TILL, NOT	0.3	0.0
11		2.0	@ 0930						DEFINITIVE.		
							EOB @ 11' BGS. ~5' BELOW				
							WATER TABLE.				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: J. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:

ELEVATION FROM:

BORING NO.: SB03
START DATE: 3/15/05
COMPLETION: DATE: 3/15/05
MON. WELL NO.: NA
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							ASPHALT SURFACE				
1		2.5	SWOS-S-SB03-0103 @ 0950			YELLOW TO DARK OLIVE GRAY	2" ASPHALT. SILTY, F-C SAND, SOME SUBANG. GRAVEL	SM	MOIST.		
2							↓	↓		0.0	0.0
3		3.0									
4		0.2	- SB03-0305	▽ SATURATED			FINE SANDY SILT.	ML	1ST ATTEMPT @ 0305 = POOR RECOV.	1.0	0.0
5		2.0	@ 0955			BROWN		↓	~~POSS. PERCHED~~ TT SATURATED @ 3-4' BGS.		
6		2.0	-SB03-0507				SILTY F-M POORLY GRADED SAND. SOME F-C GRAVEL (SUBROUNDED).	SM		1.5	0.0
7		2.0	@ 1000			DARK GRAY			POSS. ASBESTOS MATERIAL NOTED IN SLUGH FROM 1-3 BGS ON 2ND 3-5'		
8		1.9	-SB03-0709				SILT. MOSTLY SILT, TRACE F-C SAND, TRACE GRAVEL (SUBROUNDED-SUBANG.)	ML		1.3	0.0
9		2.0	@ 1010			REDDISH BROWN TO WHITE	↓		SAMPLE. → DENSE INCRE COHESIVE, MOIST, SATURATED		
10		2.0	-SB03-0911			DARK GRAY				2.0	0.0
11		2.0	@ 1015				↓	↓	POSS. TILL @ 7' BGS.		
							BOB @ 11' BGS.				
							STOP BORING ~ 5' + BELOW				
							WATER TABLE.				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

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Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:

ELEVATION FROM:

BORING NO.: SB04
START DATE: 3-15-05
COMPLETION: DATE: 3-15-05
MON. WELL NO.:
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE				
1							3" PAVED W/ ASPHALT. SAND & GRAVEL ROADBASE TO 1' BGS.	FILL			
2		1.6	SWOS-S-SB04-0103			LT. BROWN				2.0	0.0
3		2.0	@ 1235			BROWN/ LT. GRAY	SILTY, F-M SAND. POORLY GRADED, SOME ~~SUBAND. GRAVEL. TRACE FILL~~ DEBRIS (METAL)	SP/SM FILL	DAMP.		
4		1.5	- SB04-						MOIST @ 2.8'	3.3	0.0
5		2.0	0305 @ 1237	▽			FILL INC. CONCRETE & NAIL OR WIRE FRAGMENTS		WET.		
6		1.3	- SB04				CONCRETE FRAG. IN NOSE.		SATURATED @ ~5-6' BGS	3.8	18.5
7		2.0	0507 @ 1245			DARK GRAY	0507 = FINE SANDY SILT. MOSTLY SILT SOME FINE SAND, TRACE ROUNDED GRAVEL.	ML			
8		1.8	- SB04-0709						LT. PETROLEUM ODOR NOTED.	38.6	43.4
9		2.0	@ 1250			LT. GRAY					
10		1.7	- SB04-0911			DARK GRAY				13.3	15.6
11		2.0	@ 1300.								
							EOB @ 11' BGS. NOT REFUSAL				
							>5' BELOW WATER TABLE.				
							NO BEDROCK ENCOUNTERED				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB05
START DATE: 3-15-05
COMPLETION: DATE:
MON. WELL NO.:
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE				
1							3" ASPHALT. SAND & GRAVEL ROAD BASE TO 1'.	FILL			
2		2.0	SWOS-S-SB05-			BROWN TO GRAY	SILTY F-M SAND. SOME F-C GRAVEL.	SM	FILL	9.7	5.8
3		2.0	0103 1320								
4		1.5	SWOS-S-SB05-				- INC. ABUNDANT FILL DEBRIS INC. BRICK, WOOD, METAL, + CONCRETE			86.6	236.7
5		2.0	0305 1325								
6		0.8	SWOS-S-SB05-			DARK GRAY	SILT. SOME FINE-MED. SAND.	ML	PID=72 PPM IN BOREHOLE FID=800ppm	5.2	6.0
7		2.0	0307 1330				TRACE FINE SUBROUNDED GRAVEL		0.0 ppm BOTH METERS ~6" ABOVE GROUND		
8		1.2	SWOS-S-SB05-				FINE SANDY SILT. MOSTLY SILT, SOME FINE SAND, TRACE SUBANG. GRAVEL.		SATURATED @ ~	10.6	232.8
9		2.0	0709 1335			OLIVE GRAY			5' BGS.		
10		2.0	SWOS-S-SB05-						POSS. TILL @7' - INC. DENSE.	23.2	14.4
11		2.0	0911 1345								
12			SWOS-S-SB05-				FINE SANDY SILT. MOSTLY SILT, SOME F-MED SAND, SOME F-C SUBANG. GRAVEL			19.6	0.4
13		3.2	1115 1355								
14										44.9	0.0
15		3.7									
							EOB @ 14.7' BGS = REFUSAL. NO BEDROCK NOTED.				

*SM. SAR

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB06
START DATE: 3/15/05
COMPLETION: DATE:
MON. WELL NO.:
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE				
1			SWOS-S-SB06-0103 @ 1410			TAN	2" ASPHALT. SAND. MOSTLY F-C WELL GRADED SAND, SOME F-C ROUNDED GRAVEL.	SW	DRY		
2		1.7/2.0								10.0	0.0
3											
4		1.1/2.0	SB06-0305 @ 1415			BROWN			DAMP	19.0	18.7
5											
6		1.3/2.0	SB06-0507 @ 1420			GRAY	SANDY, SILT. MOSTLY SILT, SOME F-M SAND, TRACE FINE GRAVEL.	ML	SATURATED 5-5.5' BGS.	189.6	45.9
7							BOTTOM 4" = PEAT. ~50% ROOT FIBER 50% FINE SAND.				
8		1.9/2.0	SB06-0709 @ 1425				ORGANIC SILT. MOSTLY SILT, SOME FINE SAND, TRACE-FEW ROOT FIBERS	OL	PETROLEUM ODOR NOTED, NO SHEEN OR NAPL.	196.7	148.7
9						BROWN GRAY					
10			SB06-0911 @ 1430				SAND. MOSTLY F-M POORLY GRADED SAND TRACE SILT.	SP		39.6	17.6
11		2.0				ORANGE & GRAY			STRONG PET. ODOR, NO SHEEN		
							EOB @ 11' BGS. NO REFUSAL OR BEDROCK NOTED.				
							7.5' BELOW WATER TABLE				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB07
START DATE: 3-15-05
COMPLETION: DATE: 3-15-05
MON. WELL NO.:
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE.				
1						TAN	3" ASPHALT. F-C SAND, SOME F-C GRAVEL ROAD BASE				
2		1.8 / 2.0	SWOS-S-SB07-0103 @ 1410			BROWN	SILTY, F-M SAND. MOSTLY F-M SAND,	FILL/SP	DRY. LOOSE.	0.7	0.0
3							SOME SILT, SOME FEW F-C SUBANG. GRVL.				
4		1.9 / 2.0	DUP02 @ 1415 -SB07-0305 @ 1420			GRAY	-INC. ABUNDANT MAN MADE FILL BRICK, POSS. ASBESTOS MAT/CONCRETE.			32.1	64.5
5				▽					WET. ODOR STRONG @5'! ▽@5 BGS ✓ col IM. PROBE, NO LNAPL		
6		1.1 / 2.0	-SB07-0507 @ 1425			DARK GRAY BLACK	SANDY, SILT, SOME GRAVEL. TRACE ROOT FIBERS			30.8	39.9
7									STRONG PET. ODOR NO SHEEN OR NAPL		
8		1.6 / 2.0	-SB07-0707 @ 1430							34.6	282.5
9						DARK GRAY	~~SANDY, SILTY~~ FINE SAND. FEW SILT. TRACE ROOT FIBERS.	SP			
10		1.8 / 2.0	-SB07-0911 @ 1440						FREE OIL DROPS (LNAPL) NOTED ADHERING TO ACETATE LINER & FLOATING ON WATER INSIDE CORE.	22.1	162.3
11							EOB @ 11' BGS. STOPPED DUE TO ~5' BELOW WATER TABLE, NO REFUSAL, NO BEDROCK.				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB08
START DATE: 3-15-05
COMPLETION: DATE: 3-15-05
MON. WELL NO.: NA
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE.				
1						TAN	3"- ASPHALT 3"-1'= SAND, SOME GRAVEL. ROADBASE FILL.				
2		2.0	SWOS-S-SB08-0103 @			BROWN	SILTY F-M SAND. SOME F-C GRAVEL.	SP	DRY	0.5	7.8
3		2.0	1550			GRAY					
4		1.8	SWOS-S-SB08-0305 @			BLACK	HEAVY PET. STAINING @ ~3.5'BGS 2-3" THICK & AGAIN @ 5'		DAMP	44.1	786
5		2.0	1555	▽		DARK GRAY					
6		1.7	SWOS-S-SB08-0507 @				SANDY SILT. MOSTLY SILT, SOME SAND (FINE) TRACE ROOT FIBERS	ML/OL	SATURATED @	37	932
7		2.0	1600						~5' BGS.		
8		1.9	SWOS-S-SB08-0709 @				SAND. MOSTLY F-MED. POORLY GRADED SAND, TRACE SILT.	SP	STRONG PET. ODOR, STAINING &	13.4	229.8
9		2.0	1605			SLIGHTLY ORANGE	- INC. TRACE F-C ROUNDED GRAVEL		SHEEN.		
10				REFUSAL			REFUSAL @ 9' BGS.				
11							POSS. TOP OF BEDROCK.				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB09
START DATE: 3/16/05
COMPLETION: DATE: 3/16/05
MON. WELL NO.:
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE				
1						TAN	3" ASPHALT SAND, SOME F-C ROUNDED GRAVEL ROAD BASE	FILL/ SW	DAMP.		
2		1.4	SWOS-S-SB09-			BROWN	SILTY, SAND. MOSTLY F-MED. SAND, SOME SILT, FEW F-C SUBANG. GRAVEL	SM		2.3	0.0 *
3		2.0	0103@ 0900			OLIVE GRAY	SIMILAR TO ABOVE, GRAVEL		FID & PID 1-10 ppm		
4		1.8	SWOS-S-SB09- 0305@				INC. TO SOME & SUBROUNDED		@ SOIL CORE @ 5' BGS	6.0	11.9
5		2.0	0905				TO SUBANG.				
6		1.9	SWOS-S-SB09- 0507@	▽					POSS. SATURATED @ ~5-5.5'	6.2	18.9
7		2.0	0910	▽					BUT DRY-DAMP BELOW THAT, SLIGHTLY FISSILE.		
8		1.8	SWOS-S-SB09- 0709@							58.6	182.9 *
9		1.5	0915	REF.@ 8.5'					6-7' BGS. TILL.		
10							EOB @ 8.5' BGS = REFUSAL.		SATURATED 7-9' OXIDATION STAINING, GRAVELS IN 7-8.5' INTERVAL.		

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

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Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB10
START DATE: 3/16/05
COMPLETION: DATE: 3/16/05
MON. WELL NO.:
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]	
0							PAVED SURFACE				
1						TAN	3" ASPHALT. ROAD BASE GRAVELLY, SAND TO 1' BGS			PID	FID
2		2.0	SWOS-S-SB10-			OLIVE	SILTY, SAND, MOSTLY F-MED. SAND,		DAMP. FILL.	2.3	47.9
3		2.0	0103 @ 0945			BROWN/ GRAY	SOME SILT, FEW F-C SUBROUNDED GRAVEL. (QTZ, PHYLLITE, GRANITE) TRACE FILL INC.		GLASS		
4		1.9	SWOS-S-SB10- 0305 @							2.0	21.2
5		2.0	0952								
6		0.7	SWOS-S-SB10- 0507 @	▽			SANDY, GRAVEL. MOSTLY BROKEN ROCK		SATURATED	4.5	11.7
7		2.0	0955				FRAGMENTS, GRAVEL SIZE POSS BROKEN COBBLES, SOME SAND, TRACE SILT, TRACE WOOD		FRAGMENTS		
8		1.0	SWOS-S-SB10- 0709 @							0.3	0.0
9		2.0	1000				SILTY, SAND. MOSTLY F-M SAND, SOME SILT, SOME F-C GRAVEL (SUBRND-SUBANG.)		INC. DENSE TILL.		
10		1.1	SWOS-S-SB10- 0911 @							2.0	15.0
11		2.0	1010			OXIDATION REDDISH/ORANGE					
							EOB @ 11' BGS				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

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Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB11
START DATE: 3/16/05
COMPLETION: DATE: 3/16/05
MON. WELL NO.: NA
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE				
1						TAN	4" ASPHALT. SAND & GRAVEL BASE TO 1' BGS				
2		2.0	SWOS-S-SB11-0103 @1040			BROWN	SAND & GRAVEL. MOSTLY F-C SAND & F-C GRAVEL, TRACE SILT.	SW/GW	DRY	10	29.9 *
3		2.0	MS/MSD			↓					
4		1.1	SWOS-S-SB11-0305 @ 1045							285	40.6 *
5		2.0									
6		0.6 / 1.0	SWOS-S-SB11-0506 @ 1050							19.6	17.7
7							REFUSAL @ 6' BGS. GRANITE FRAGMENT IN NOSE OF SAMPLER, POSS. CONGLOMERATE.				
8											
9											
10											

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

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Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB-12
START DATE: 3/16/05
COMPLETION: DATE: 3/16/05
MON. WELL NO.:
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE				
1							3" ASPHALT. SAND & GRAVEL BASE RATE TO 1.2'				
2		1.9	SWOS-S-SB12-0103@			BROWN	SILTY, SAND. MOSTLY F-MED SAND SOME SILT, FEW F-C GRAVEL	SM	DRY.		
3		2.0	1115			GRAY					
4		1.4	SWOS-S-SB12-								
5		2.0	0305 @ 1120								
6		1.6	SWOS-S-SB12-0507@	▽		DARK GRAY	SILTY, SAND. MOSTLY FINE-MED. SAND SOME SILT, TRACE ROUNDED GRAVEL TRACE ROOT FIBERS	SP	SATURATED @ ~5-5.5' STRONG PETROLEUM ODOR + STAINING 5' DOWN. TILL.		
7		2.0	1125								
8		1.5	SWOS-S-SB12-0709@				GRAVELLY, SILTY SAND. MOSTLY F-C SAND, SOME SILT, SOME F-C SUBANGULAR/SUBROUND GRAVEL.				
9		2.0	1130								
							REFUSAL @ 9' BGS				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

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Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB-13
START DATE: 3-16-05
COMPLETION: DATE: 3-16-05
MON. WELL NO.: NA
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							PAVED SURFACE				
1							3" ASPHALT, SAND & GRAVEL ROADBASE TO 1.1'				
2		1.9	SWOS-S-SB13-0103 @ 1250			BROWN	SILTY SAND. MOSTLY F-MED. SAND SOME GRAVEL, SOME F-C GRAVEL (SUBANG.).	SM		5.4	40.9
3		2.0						/ML			
4		1.9	SWOS-S-SB13-0305 @ 1255			BLACK	FILL. ASPHALT FRAGMENTS, METAL PLATE ~ 1/4" THICK, FIRE-BRICK FRAGS + GRAVEL, TRACE SAND + SILT.		SATURATED @ 4.5-5' BGS.	41.2	231.6
5		2.0		▽							
6		2.0	SWOS-S-SB13-0507 @ 1300			LT. GRAY + YELLOW STAINING	S-3A = 4" SIMILAR TO ABOVE. S-3B = 1.75' - SILTY FINE SAND.	SP	STRONG PET. ODOR + STAINING ESP. 6-7' BGS.	133	1922
7		2.0					MOSTLY FINE POORLY GRADED SAND, SOME FEW SILT.				
8		1.9	SWOS-S-SB13-0709 @ 1305				SAND. MOSTLY FINE POORLY GRADED SAND, TRACE SILT.	SP		119	821
9		2.0									
10		1.7	SWOS-S-SB13-0911 @ 1310						PET. STAINING + SHEEN.	31.9	76.4
11		2.0									
							EOB @ 11' BGS. NO BEDROCK OR REFUSAL. STOPPED DUE TO DEPTH BELOW WATER TABLE.				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

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Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB14
START DATE: 3/16/05
COMPLETION: DATE: 3/16/05
MON. WELL NO.:
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							GRASS SURFACE				
1		0.8/1.0	SWOS-S-SB14-0001 @ 1415			BROWN TAN BROWN	TOPSOIL/LOAM ~4" SILTY, F-C SAND, TRACE GRAVEL	SW	ROOTS TO 1-2" ICE/SNOW @ SURFACE		
2		1.0/1.0	SWOS-S-SB14-0102 @ 1420				TRACE BRICK FRAGS.		SATURATED.	0.9	0.2
3		1.7/2.0	SWOS-S-SB14-0204 @ 1425				SAND. MOSTLY F-C WELL GRADED SAND. TRACE SILT, TRACE ROUNDED F-C GRAVEL		NON-WOVEN GEOTEXTILE @ ~3' BGS.?		
4						GRAY				58.9	56.9
5		2.0/2.0	SWOS-S-SB14-0406 @ 1430						DAMP/MOIST.	19.3	43.2
6										71.3	~~622~~
7		1.8/2.0	SWOS-S-SB14-0608 @ 1435						SATURATED @ ~7' BGS.	15.4	194
8										19.7	
9		0.5/0.5	NO SAMPLE	REFUSAL			PHYLLITE FRAGMENTS POSS. TOP OF BEDROCK		DRY.	13.7	141.7
10							REFUSAL @ 8.5' BGS.		NO PET. ODOR OR STAINS NOTED.		

* 2 SAMPLES EACH
* "
2-4 = 71.3/622

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

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Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB15
START DATE: 3-16-05
COMPLETION: DATE: 3-16-05
MON. WELL NO.: NA
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]	
0							GRASS SURFACE				
1		0.9/1.0	SWOS-S-SB15-0001 @ 1545			BROWN	TOPSOIL - ROOTS TO 2".			PID 46.7	FID 89.2
2		1.0/1.0	SWOS-S-SB15-0102 @ 1555			RED, BLACK	SILTY, F-C SAND, TRACE GRAVEL, TRACE FILL (BRICK) - INC - FILL (BRICK, WOOD).	FILL	DAMP, LOOSE	327	1441
3		1.6/2.0	SWOS-S-SB15-0204 @ 1600			BROWN, RED, BLACK	FILL, WOOD, BRICK, TRACE SILT, TRACE GRAVEL		DAMP.	131	302
5		2.0/2.0	SWOS-S-SB15-0406 @ 1605			OLIVE GRAY	SILTY SAND. MOSTLY F-M(C) SAND, SOME SILT, FEW GRAVEL, TRACE BRICK FRAGMENT & CONCRETE.		WET SATURATED.	53.5	407
7		1.6/2.0	SWOS-S-SB15-0608 @ 1610						- NO PET. ODOR NOTED.	6.0	220
9		2.0/2.0	SWOS-S-SB15-0810 @ 1615				- NO MANMADE DEBRIS NOTED			11.5	17.2
							EOB @ 10' BGS				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB16
START DATE: 3-16-05
COMPLETION: DATE: 3-16-05
MON. WELL NO.: NA
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							GRASS SURFACE				
1		1.0 / 1.0	SWOS-S-SB16-0001 @ 1625			Brown	TOPSOIL. ROOT LAYER 1" THICK. SILTY, SAND. TRACE WOOD DEBRIS.	FILL	DRY/DAMP		
2		1.0 / 1.0	SWOS-S-SB16-0102 @ 1628			~~Olive Brown~~	SILTY, SAND. MOSTLY F-MED. SAND, SOME SILT, FEW F-C GRAVEL	SM/FILL		34.8	52.6 * 4/644.
3		1.9 / 2.0	SWOS-S-SB16-0204 @ 1630			Olive Gray	- TRACE FINE BLACK FRAG		WET/MOIST	7.3	5.2 *
4										216	664.3 (D)
5		1.8 / 2.0	SWOS-S-SB16-0406 @ 1635							84.4	161.6 *
6				▽ ~5.5-6'					SATURATED @ ~6'	~~7.0~~ (D)	
7		1.8 / 2.0	SWOS-S-SB16-0608 @ 1640				- SLIGHTLY FISSILE, INC. DENSE		TILL? POSS.	13.6	15.4
8											
9		1.9 / 2.0	SWOS-S-SB16-0810 @ 1645							6.5	10.6
10											
							EOB @ 10' BGS ~ 5' BELOW WATER TABLE				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

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Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB17
START DATE: 3-17-05
COMPLETION: DATE: 3-17-05
MON. WELL NO.: NA
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]	
0							GRASS SURFACE				
1		0.9/1.0	SWOS-S-SB17-0001 @ 0820	SWOS @ 0824		BROWN	TOPSOIL. LOAM. SILTY, SAND. MOSTLY F-M SAND, SOME SILT, TRACE GRAVEL.	SP FILL	WET DAMP.	PID 22.1	FID 11.3
2		0.7/1.0	SWOS-S-SB17-0102 @ 0825							14.7	18.6
3		0.9/2.0	SWOS-S-SB17-0204 @ 0830				SAND. MOSTLY F-MED. SAND, FEW SILT	SP/FILL	DAMP	17.1	15.4
4										16.3	18.5
5		0.8/2.0	SWOS-S-SB17-0406 @ 0835			OLIVE BROWN	-INC. TRACE ROUNDED GRAVEL		WET. SATURATED @ ~6'		
6											
7		1.9/2.0	SWOS-S-SB17-0608 @ 0840				S-5A=~4" SIMILAR TO ABOVE. S-5B=1.6' - SILTY, GRAVELLY SAND. MOSTLY F-C SAND, SOME F-C GRAVEL, SOME SILT.	SM/GM	POSS. TILL INC. DENSE. SLIGHTLY FISSILE	13.8	22.1
8											
9		1.9/2.0	SWOS-S-SB17-0810 @ 0845				~~S-6A=0.4' SIMILAR TO ABOVE.~~ SIMILAR TO ABOVE, COLOR CHANGE @ ~ 9' BGS.			59.6	89.2
10						YELLOW-BROWN			TILL.		
11		1.8/2.0	SWOS-S-SB17-1012 @ 0850							42.1	55.9
12											
							EOB @ 12' BGS. NOT REFUSAL, >5' BELOW WATER TABLE.				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB18
START DATE: ~~3-17-05~~ 3/17/05
COMPLETION: DATE: 3/17/05
MON. WELL NO.: NA
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]	
0							GRASS SURFACE				
1		0.7/1.0	SWOS-S-SB18-0001 @ 0915			BROWN	TOPSOIL, ROOTS TO 2", SILTY, F-MED. SAND, TRACE RANDED GRAVEL.	SM	WET	PID 74.6	FID 86.1
2		0.6/1.0	SWOS-S-SB18-0102 @ 0920			↓	↓		DAMP	13.1	6.0
3		1.7/2.0	SWOS-S-SB18-0204 @ 0925						WET	139.2	145.6
4						↓	↓				
5		1.9/2.0	SWOS-S-SB18-0406 @ 0930	▽ ~5-5.5		OLIVE BROWN	SILTY, SAND. MOSTLY F-MED SAND, SOME SILT, FEW F-C SUBANG. GRAVEL	SM		406.7	50.2
6						GRAY	↓		SATURATED @ ~5-5.5 STRONG PET. ODOR + GRAY STAINING		
7		1.7/2.0	SWOS-S-SB18-0608 @ 0935							456.2	66.3
8				POSS. TOP OF BEDROCK			GRAVEL, TRACE SILT + SAND. MOSTLY PHYLLITE FRAGMENTS.	GP	POSS. TOP OF WEATHERED BEDROCK.		
9		1.8/2.0	SWOS-S-SB18-0810 @ 0940			↓	↓ POSS. BEDROCK.			351.8	31.2
10											
11		1.7/2.0	SWOS-S-SB18-1012 @ 0945			GRAY + BLACK SLIGHT OXIDATION STAINING + PET. STAINING IN FRACTURES	↓		FREE-PRODUCT NOTED IN FRACTURES W/ HEAVY STAINING	348.6	37.8
12							EOB @ 12' BGS REFUSAL.		LNAPL FLOATING ON FREE WATER INSIDE ACETATE SLEEVE - COLLECTED IN HEADSPACE JAR. SMELLS LIKE MACHINE OR MOTOR OIL. NOTIFY D. CHISHOLM @ OFFICE		

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

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Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: ~~SB20~~ 19
START DATE: 3/17/05
COMPLETION: DATE: 3/17/05
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							GRASS SURFACE				
		0.7/1.0	SWOS-S-SB20-0001 @ 1109			BROWN	TOPSOIL. ~2" GRASS ROOTS. SILTY, F-MED SAND. TRACE ROUNDED GRAVEL.	SP	WET.	44.3	13.3
2		0.8/1.0	SWOS-S-SB20-0102 @ 1105			↓	↓	↓	DRY	75.6	68.2
		1.6/2.0	SWOS-S-SB20-0204 @ 1110			GRAY	SAND. MOSTLY F-MED. SAND, FEW SILT, FEW SUBANG. GRAVEL. CONCRETE IN NOSE OF SAMPLE.	SP/FILL	DAMP. FILL	7.3	0.0
4											
		1.9/2.0	SWOS-S-SB20-0406 @ 1115						DAMP.	6.3	0.0
6						↓	↓ FILL INC. CEMENT & CONCRETE				
		1.8/2.0	SWOS-S-SB20-0608 @ 1120	▽ ~6.5-7'		DARK GRAY	SILTY, F-MED. SAND. MOSTLY F-MED SAND, SOME SILT, FEW GRAVEL (SUBANG/SUBRND)		SATURATED @ ~6.5-7'. NO ODOR NOTED. POSS. TILL	6.8	2.8
8						↓	↓				
		2.0/2.0	SWOS-S-SB20-0810 @ 1125			YELLOW BROWN SLIGHT OXIDATION ON GRAINS	COLOR CHANGE & MORE DENSE THAN ABOVE			4.6	0.0
10							REFUSAL @ 10' BGS				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

PAGE: OF

Ttnus Form 0018

BORING LOG FOR: SWOS
PROJECT NO.: 5339-0540
LOGGED BY: T. Dorgan
DRILLED BY (Company/Driller): Drilex Environmental
GRD. SURFACE ELEVATION:

TRANSCRIBED BY:
ELEVATION FROM:

BORING NO.: SB20
START DATE: 3/17/05
COMPLETION: DATE: 3/17/05
MON. WELL NO.: N/A
CHECKED BY:

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)] PID	FID
0							GRASS SURFACE				
		0.8/1.0	SWOS-S-SB20-0001 @ 1145			BROWN TAN	TOPSOIL. SILTY F-MED SAND. SOME SILT FEW ROUNDED GRANITE GRAVEL.	FILL/	WET / SATURATED	4.5	0.1
2		1.0/1.0	SWOS-S-SB20-0102 @ 1150			GRAY, RED & BLACK	FILL. SILT & SAND & GRAVEL MIXED WITH BRICK, CONCRETE, ASPHALT DEBRIS.	SP		3.6	0.4
4		1.7/2.0	SWOS-S-SB20-0204 @ 1155			OLIVE GRAY	SILTY F-MED. SAND. MOSTLY F-MED. SAND SOME SILT, TRACE GRAVEL.	SM	DAMP.	6.8	0.0
		1.6/2.0	SWOS-S-SB20-0406 @ 1200	5-6'			S-4A-0.6' SIMILAR TO ABOVE. S-4B-0.3' - SAND - F-C WELL GRADED S-4C-0.7' - SILTY, SAND. MOSTLY F-C SAND, SOME SILT, FEW F-C SUBROUNDED/SUBANG. GRAVEL.	SW		0.4	0.0
6		1.8/2.0	SWOS-S-SB20-0606 @ 1205						POSS. TILL. INC. DENSE & COMPACT. SATURATED @ 5-6' BGS	0.4	0.0
8		2.0/2.0	SWOS-S-SB20-0810 @ 1210							1.2	0.0
10							REFUSAL @ 10' BGS				

TYPE OF DRILLING RIG:
METHOD OF ADVANCING BORING:
METHOD OF SOIL SAMPLING:
METHOD OF ROCK CORING: N/A
GROUNDWATER LEVELS:
OTHER OBSERVATIONS:

BORING NO.:

Tetra Tech NUS, Inc.

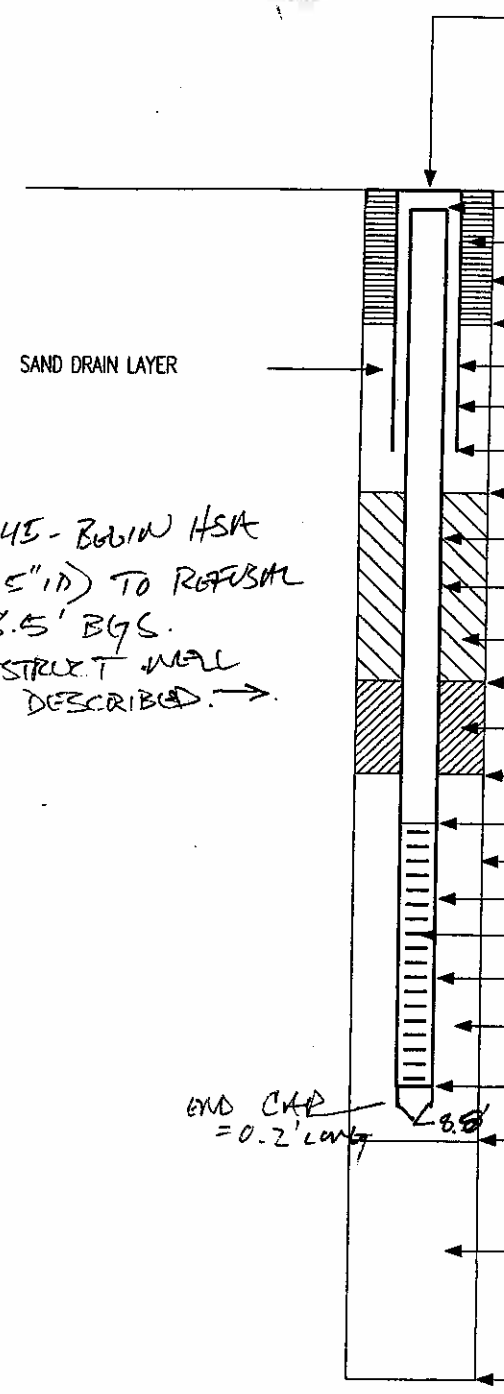
PAGE: OF

Ttnus Form 0018

FLUSH MOUNT MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS INC.

PROJECT NAME:	SWOS	PROJECT NO:	5339-0540
PROJECT LOCATION:	NAVSTA Newport	WELL NO:	MW-01
CLIENT:	U.S. NAVY / LFANE	BORING NO:	SB09
CONTRACTOR:	Drilex Environmental	DRILLER: STEVE / DRILEX ENV.	BORING LOCATION:
LOGGED BY:	T.J. ORGAN	DATE: 3/16/05	SOUTH EAST CORNER OF SITE EDGE OF PARKING LOT NEAR CORT & KNIGHT ST
CHECKED BY:		DATE:	PAGE: 1 OF 1



LENGTH RISER PIPE BELOW GRD. SURF.(Ft.)	0.40
TYPE OF SURFACE SEAL	CONCRETE
DIA. SURFACE SEAL BGS (In.)	SQUARE CUT 1.4 x 1.4
DEPTH TO BOTTOM OF SURFACE SEAL (Ft.)	0.5'
I.D. OF PROTECTIVE CASING (In.)	8
TYPE OF PROTECTIVE CASING	STEEL BOARDBOX
DEPTH BOTTOM OF PROTECTIVE CASING (Ft.)	1.0
DEPTH BOTTOM OF DRAIN LAYER (Ft.)	1.7'
RISER PIPE (In.) I.D.: 2	O.D.: 2 3/8
TYPE OF RISER PIPE	SCHEDULE 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	SILICA SAND
DEPTH TOP OF SEAL (Ft.)	~~1.5'~~ 1.7'
TYPE OF SEAL	(HYDRATED) BENTONITE CHIPS
DEPTH BOTTOM OF SEAL (Ft.)	2.5
DEPTH TOP OF PERVIOUS SECTION (Ft.)	~~3.8~~ 3.8
DIAMETER OF BOREHOLE (In.)	~7"
TYPE OF PERVIOUS SECTION	SCHEDULE 40 PVC
TYPE OF OPENINGS	0.010 FACTORY SLOTTED
PERVIOUS SECTION (In.) I.D.: 2	O.D.: 2 3/8
TYPE OF FILTER PACK AROUND PERVIOUS SECTION	SILICA SAND
DEPTH BOTTOM OF PERVIOUS SECTION (Ft.)	8.6'
DEPTH BOTTOM OF FILTER PACK (Ft.)	8.8'
TYPE OF BACKFILL (GROUT) BELOW FILTER PACK	NA
END OF BORING	8.8'

0745 - BEGIN HSA (4.25" ID) TO REFUSAL @ 8.5' BGS. CONSTRUCT WELL AS DESCRIBED. →

GENERAL NOTE:

1. Entry of 0.00 for Ground Elevation Indicates that Surveyed Ground Elevation is NOT Available.

0745-

TtNUS Form 0058

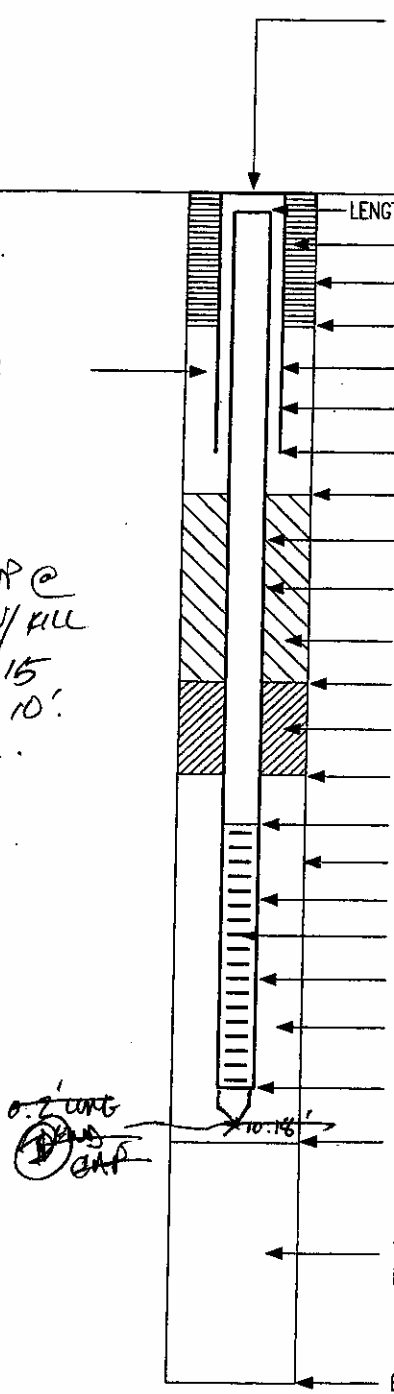
FLUSH MOUNT MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS INC.

PROJECT NAME:	SWOS	PROJECT NO:	5339-0540
PROJECT LOCATION:	NAVSTA Newport	WELL NO:	MW-02
CLIENT:	U.S. NAVY - EFANE	BORING NO:	SB20
CONTRACTOR:	Drilex Environmental	DRILLER:	STEVE
LOGGED BY:	Tracy Dorlan	DATE:	3/18/05
CHECKED BY:		DATE:	

BORING LOCATION: SOUTH OF BLDG 1362 ~5' NORTH OF SIDEWALK IN GRASS

PAGE: 1 OF 1



LENGTH RISER PIPE BELOW GRD. SURF.(Ft.)		0.23'
TYPE OF SURFACE SEAL		CONCRETE
DIA. SURFACE SEAL BGS (In.)		8"
DEPTH TO BOTTOM OF SURFACE SEAL (Ft.)		0.5'
I.D. OF PROTECTIVE CASING (In.)		8
TYPE OF PROTECTIVE CASING		STEEL PIPE
DEPTH BOTTOM OF PROTECTIVE CASING (Ft.)		1.0
DEPTH BOTTOM OF DRAIN LAYER (Ft.)		1.5
RISER PIPE (In.)	I.D.: 2	O.D.: 2 3/8
TYPE OF RISER PIPE		SCHEDULE 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE		SILICA SAND
DEPTH TOP OF SEAL (Ft.)		1.5
TYPE OF SEAL	(HYDRATED)	BENTONITE CHIP
DEPTH BOTTOM OF SEAL (Ft.)		2.8'
DEPTH TOP OF PERVIOUS SECTION (Ft.)		4.18'
DIAMETER OF BOREHOLE (In.)		~7"
TYPE OF PERVIOUS SECTION		SCHEDULE 40 PVC
TYPE OF OPENINGS		0.010" FACTORY SLOTTED
PERVIOUS SECTION (In.)	I.D.: 2	O.D.: 2 3/8
TYPE OF FILTER PACK AROUND PERVIOUS SECTION		SILICA SAND
DEPTH BOTTOM OF PERVIOUS SECTION (Ft.)		~~19.98'~~ 10.18'
DEPTH BOTTOM OF FILTER PACK (Ft.)		10.18'
TYPE OF BACKFILL (GROUT) BELOW FILTER PACK		NA
END OF BORING		10.18'

0900 SET UP @ LOC. TROUBLE W/ KILL SWITCH. FIX. 0915 4.25" ID HSA TO 10'. CONSTRUCT WELL.

GENERAL NOTE:

1. Entry of 0.00 for Ground Elevation Indicates that Surveyed Ground Elevation is NOT Available.

TtNUS Form 0058

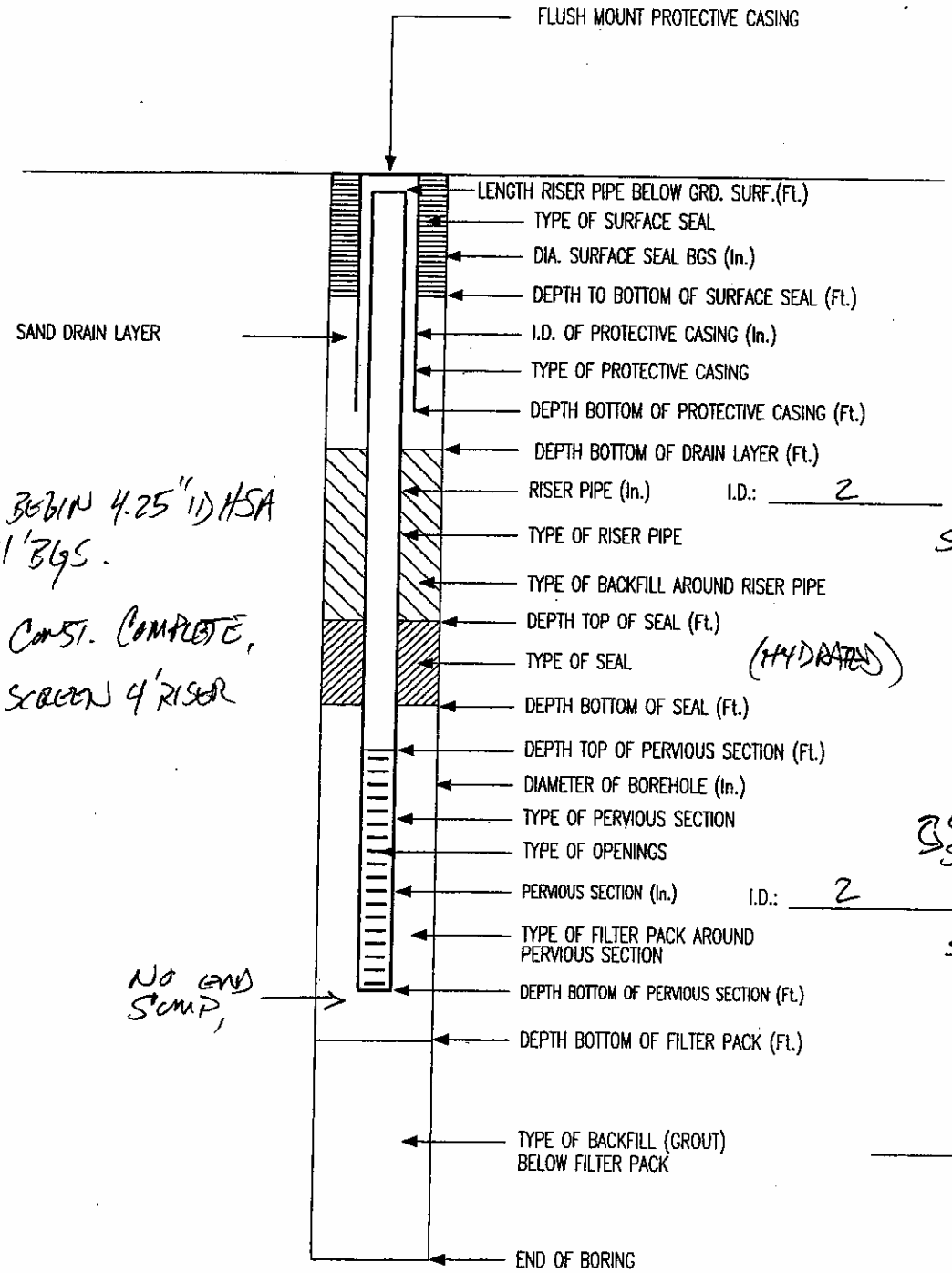
FLUSH MOUNT MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS INC.

PROJECT NAME:	SWOS	PROJECT NO:	5339-0540
PROJECT LOCATION:	NAVSTA Newport	WELL NO:	MW-03
CLIENT:	U.S. NAVY / LEFANE	BORING NO:	SB06
CONTRACTOR:	Drilex Environmental	DRILLER:	STEVE
LOGGED BY:	T. DARYAN	DATE:	3/18/05
CHECKED BY:		DATE:	

BORING LOCATION: PARKING LOT ~15' SOUTH OF TAYLOR DRIVE.

PAGE: 1 OF 1



LENGTH RISER PIPE BELOW GRD. SURF.(Ft.)	
TYPE OF SURFACE SEAL	CONCRETE
DIA. SURFACE SEAL BGS (In.)	1.4'X1.4' SQUARE CUT
DEPTH TO BOTTOM OF SURFACE SEAL (Ft.)	0.6'
I.D. OF PROTECTIVE CASING (In.)	8
TYPE OF PROTECTIVE CASING	STEEL PIPE ROADBOX
DEPTH BOTTOM OF PROTECTIVE CASING (Ft.)	0.8'
DEPTH BOTTOM OF DRAIN LAYER (Ft.)	1.5'
RISER PIPE (In.) I.D.: 2	O.D.: 2 3/8
TYPE OF RISER PIPE	SCHEDULE 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	NA
DEPTH TOP OF SEAL (Ft.)	1.5'
TYPE OF SEAL (HYDRATED)	BENTONITE CHIP
DEPTH BOTTOM OF SEAL (Ft.)	2.75'
DEPTH TOP OF PERVIOUS SECTION (Ft.)	3.69
DIAMETER OF BOREHOLE (In.)	~7"
TYPE OF PERVIOUS SECTION	0.010" FACTORY SLOTTED
TYPE OF OPENINGS	SCHEDULE 40 PVC
PERVIOUS SECTION (In.) I.D.: 2	O.D.: 2 3/8
TYPE OF FILTER PACK AROUND PERVIOUS SECTION	SILICA SAND
DEPTH BOTTOM OF PERVIOUS SECTION (Ft.)	10.69
DEPTH BOTTOM OF FILTER PACK (Ft.)	11'
TYPE OF BACKFILL (GROUT) BELOW FILTER PACK	NA
END OF BORING	11'

1100 BEGIN 4.25" ID HSA TO 11' BGS.

1150 CONST. COMPLETE, 7' SCREEN 4' RISER

GENERAL NOTE:

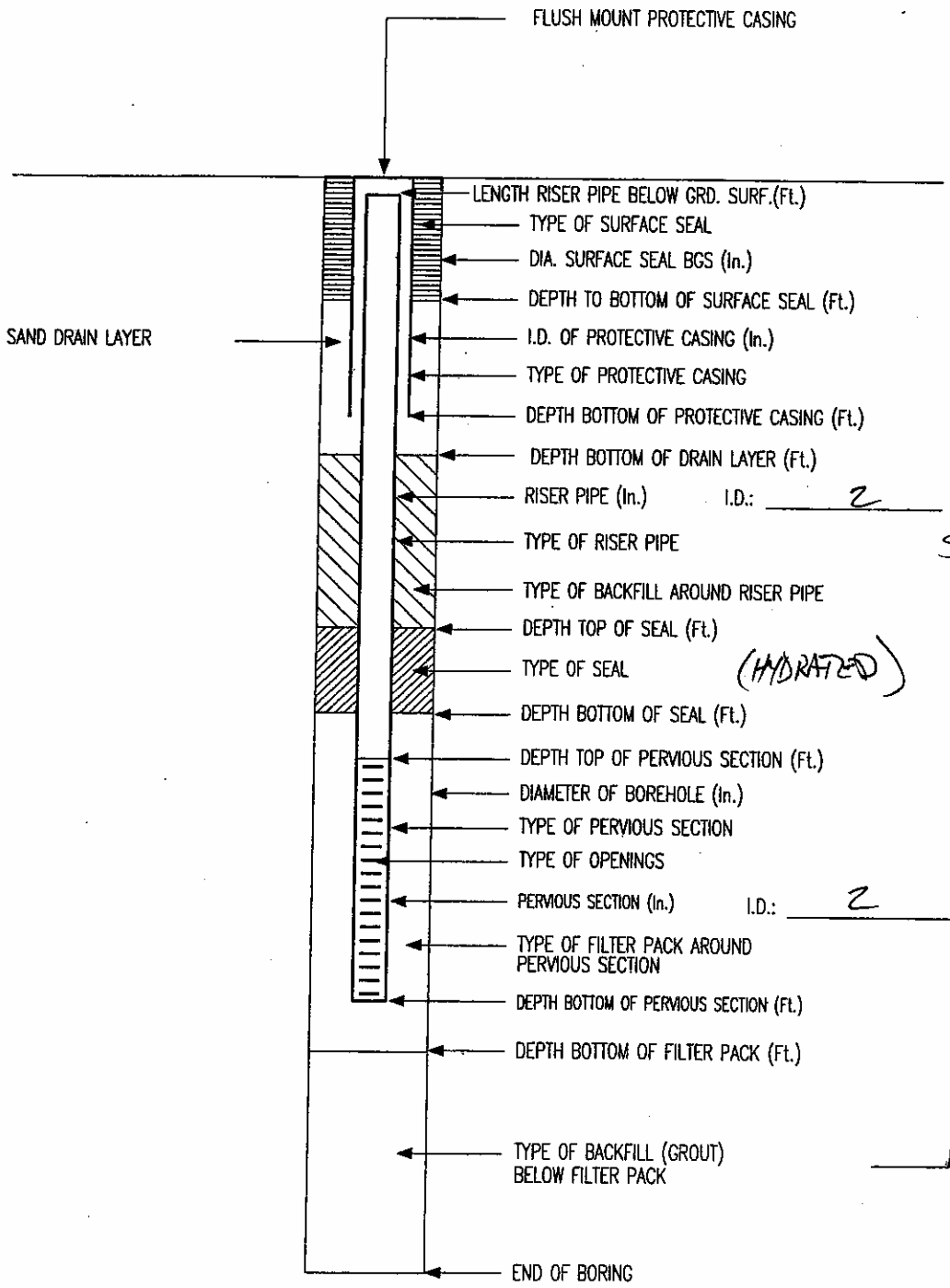
1. Entry of 0.00 for Ground Elevation Indicates that Surveyed Ground Elevation is NOT Available.

TtNUS Form 0058

FLUSH MOUNT MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS INC.

PROJECT NAME:	SWOS	PROJECT NO:	5339-0540
PROJECT LOCATION:	NAVSTA Newport	WELL NO:	MW-04
CLIENT:	U.S. NAVY - LEFANE	BORING NO:	SB07
CONTRACTOR:	Drilex Environmental	BORING LOCATION:	PARKING LOT BETWEEN BLDG 1362 & TAYLOR DRIVE
DRILLER:	STEVE		
LOGGED BY:	T. DORGAN	DATE:	3/18/05
CHECKED BY:		DATE:	
		PAGE:	1 OF 1



LENGTH RISER PIPE BELOW GRD. SURF.(Ft.)	0.24'
TYPE OF SURFACE SEAL	CONCRETE
DIA. SURFACE SEAL BGS (In.)	1.4'X1.4' SAW CUT
DEPTH TO BOTTOM OF SURFACE SEAL (Ft.)	0.6
I.D. OF PROTECTIVE CASING (In.)	8
TYPE OF PROTECTIVE CASING	STEEL PIPE ROAD BOX
DEPTH BOTTOM OF PROTECTIVE CASING (Ft.)	1.0
DEPTH BOTTOM OF DRAIN LAYER (Ft.)	1.05
RISER PIPE (In.) I.D.: 2 O.D.: 2 3/8	
TYPE OF RISER PIPE	SCHEDULE 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE	NA
DEPTH TOP OF SEAL (Ft.)	1.5
TYPE OF SEAL (HYDRATED)	BENTONITE CHIP
DEPTH BOTTOM OF SEAL (Ft.)	2.6
DEPTH TOP OF PERVIOUS SECTION (Ft.)	3.4
DIAMETER OF BOREHOLE (In.)	~7"
TYPE OF PERVIOUS SECTION	SCHEDULE 40 PVC
TYPE OF OPENINGS	0.010" FACTORY SLOTTED
PERVIOUS SECTION (In.) I.D.: 2 O.D.: 2 3/8	
TYPE OF FILTER PACK AROUND PERVIOUS SECTION	SILICA SAND.
DEPTH BOTTOM OF PERVIOUS SECTION (Ft.)	10.4
DEPTH BOTTOM OF FILTER PACK (Ft.)	11'
TYPE OF BACKFILL (GROUT) BELOW FILTER PACK	NA
END OF BORING	11'

GENERAL NOTE:

1. Entry of 0.00 for Ground Elevation Indicates that Surveyed Ground Elevation is NOT Available.

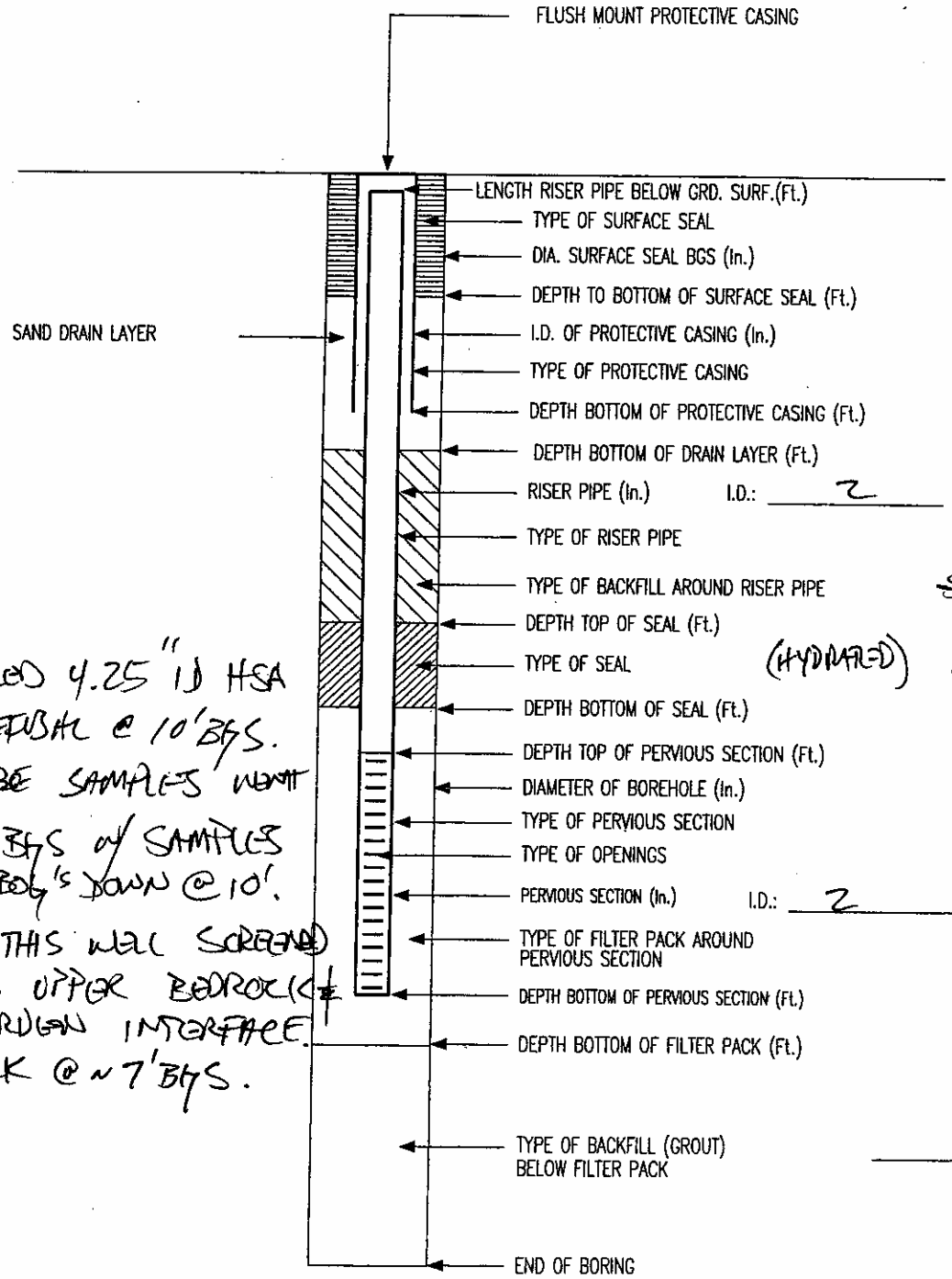
TtNUS Form 0058

FLUSH MOUNT MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS INC.

PROJECT NAME:	SWOS	PROJECT NO:	5339-0540
PROJECT LOCATION:	NAVSTA Newport	WELL NO:	MW-05
CLIENT:	U.S. NAVY - EFANE	BORING NO:	SB18
CONTRACTOR:	Drilex Environmental	DRILLER:	STEVE
LOGGED BY:	T. DURHAM	DATE:	3/18/05
CHECKED BY:		DATE:	
BORING LOCATION:	LAWN ~15' SOUTH OF TAYLOR		

PAGE: 1 OF 1



LENGTH RISER PIPE BELOW GRD. SURF.(Ft.)		0.16
TYPE OF SURFACE SEAL		CONCRETE
DIA. SURFACE SEAL BGS (In.)		~8"
DEPTH TO BOTTOM OF SURFACE SEAL (Ft.)		0.5'
I.D. OF PROTECTIVE CASING (In.)		8
TYPE OF PROTECTIVE CASING		STEEL PIPE
DEPTH BOTTOM OF PROTECTIVE CASING (Ft.)		1.0'
DEPTH BOTTOM OF DRAIN LAYER (Ft.)		1.4'
RISER PIPE (In.)	I.D.: 2	O.D.: 2 3/8
TYPE OF RISER PIPE		SCHED. 40 PVC
TYPE OF BACKFILL AROUND RISER PIPE		~~SILICA SAND~~ NA
DEPTH TOP OF SEAL (Ft.)		1.4
TYPE OF SEAL	(HYDRATED)	BENTONITE CHIP
DEPTH BOTTOM OF SEAL (Ft.)		2.5
DEPTH TOP OF PERVIOUS SECTION (Ft.)		3.75
DIAMETER OF BOREHOLE (In.)		~7"
TYPE OF PERVIOUS SECTION		SCHED. 40 PVC
TYPE OF OPENINGS		0.010" FACTORY SLOTTED
PERVIOUS SECTION (In.)	I.D.: 2	O.D.: 2 3/8
TYPE OF FILTER PACK AROUND PERVIOUS SECTION		SILICA SAND
DEPTH BOTTOM OF PERVIOUS SECTION (Ft.)		8.75
DEPTH BOTTOM OF FILTER PACK (Ft.)		10.0
TYPE OF BACKFILL (GROUT) BELOW FILTER PACK		NA
END OF BORING		10.0

ADVANCED 4.25" ID HSA TO REFUSAL @ 10' BGS. GEOPROBE SAMPLES WENT TO 12' BGS w/ SAMPLES HSA BOG'S DOWN @ 10'.

NOTE: THIS WELL SCREENED ACROSS UPPER BEDROCK & OVERBURDEN INTERFACE. BEDROCK @ ~7' BGS.

GENERAL NOTE:

1. Entry of 0.00 for Ground Elevation Indicates that Surveyed Ground Elevation is NOT Available.

TtNUS Form 0058

APPENDIX C

FIELD LOGSHEETS

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: MW-01

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/22/05

WEATHER: Sunny, ~45°F

Well Screen Depth: _____ / _____ ft. bgs

H&S Monitoring Instrument Reading 0.0 in B.Z.

Pump Type/Material: Whale Pump

Pump Intake Depth: _____

Total Purge Volume = _____ (gal)

Data Recorded By: L. Seydewitz

Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	ORP	DO mg/L	Turbidity NTU	Comments
0930	5.14		Begin surging well. Cycling between pumping and surging.							Dark grey, opaque, no sheen
0933	7.85	2 gal	Top of whale pump reached - stopped flowing so began reburping							
0938		3 gal	started pump again - dewatered - resurge							
0946		3.5 gal	total removed from well at this point. Will look at recovery							
0948	7.64		rate; mostly silt and some fine sand at bottom of bucket.							
0948:30	7.53									
0949:00	7.43									
0949:30	7.35									
0950:00	7.24									
0951:00	7.17									
0952:00	7.14									
0954:00	7.04									
0956:00	6.91									
1000:00	6.78									
1002		4.0	Began pumping to remove fines and left to recharge. Went to							
			develop MW-02							
1335	5.81	4.75		10.09	6.67	0.080	140.1	11.10	over limit	dark grey, opaque no sheen
			Well dewatered so left to recharge.							
1635	5.92	5.75	Surged and pumped well dry							

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Tt NUS Form 0013

1 well volume = 0.95 gal

7.85 2.7
5.14 .163

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: MW-01

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/23/05

WEATHER: CLOUDY, DRY, 34°F

Well Screen Depth: _____ / _____ ft. bgs

H&S Monitoring Instrument Reading 0.0 IN B-Z.

Pump Type/Material: WHALE PUMP

Pump Intake Depth: BOTTOM OF WELL

Total Purge Volume = _____ (gal)

Data Recorded By: T. DORGAN

Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Comments
0725	5.19	CHECK W.L., INSERT PUMP, RE-SURGE ENTIRE WATER COLUMN THEN TURN ON PUMP.							
			REMOVE 1 GAL. BEFORE WELL RUNS DRY. DARK GRAY SILTY WATER, TRACE FINE						
			SAND. NO ODOR OR SHEEN. ALLOW TO SIT IDLE ~5 MIN. RE-SURGE &						
			PUMP AGAIN. REMOVE ~1/4-1/2 GAL. ADDITIONAL TURBID, OPAQUE WATER. STOP						
			PUMP ALLOW WATER TO BACK FLUSH SO I CAN RE-SURGE. RE-SURGE + PUMP AGAIN + AGAIN.						
		7.75 GAL ~20 MIN.	1/2 HR. MIN. GAIN.	~2 GAL. TOT. PURGE IN 1 1/2 HR.					

Tt NUS Form 0013

Page ___ of ___

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: MW-02

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/22/05/18

WEATHER: Sunny

Well Screen Depth: _____ / _____ ft. bgs

H&S Monitoring Instrument Reading _____

Pump Type/Material: Whale Pump

Pump Intake Depth: _____

Total Purge Volume = _____ (gal)

Data Recorded By: L. Seydewitz

Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	ORP	DO mg/L	Turbidity NTU	Comments
1140	5.26	10.5	1 liter/2 sec	9.05	6.66	0.062		11.54	over limit	dark grey, opaque, no sheen
1155	5.01	12.0		8.01	6.54	0.060		11.48	over limit	stop pump (well dry) Allow to recover
1224	4.38									let well recover fully -
1305	3.77	13.0		7.40	6.85	0.062	62.1	12.00	500	water looks less opaque
1355	3.78	15.0		6.94	6.42	0.064	120.5	10.84	60	looks less opaque
1400		16.5		7.95	6.05	0.061	109.2	10.03	over limit	more opaque
1415	5.68	18.0		8.12	6.73	0.067	162.0	12.53	450	

End Development - Completed 4 hours of purging. FOL called PM to update status of well development.

Tt NUS Form 0013

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: MW-02

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/22/05

WEATHER: Sunny

Well Screen Depth: _____ / _____ ft. bgs

H&S Monitoring Instrument Reading _____

Pump Type/Material: Whale Pump

Pump Intake Depth: _____

Total Purge Volume = _____ (gal)

Data Recorded By: L Seydewitz

Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Comments
1014	3.75		Begin surging. Cycle between pumping and surging.						dark grey, opaque no sheen
1017	7.05								
1017:30	7.22	2 gal	Well dewatered - let recover						
1023			Surge then pumped						
1027		4 gal	Silt, fine sand noted on bottom of bucket. Observed sand surrounding						
1033	6.72		the PVC to be eroding on one side. Poured water in it to see if						
1038	6.15		bentonite seal might need to be rehydrated. The water was absorbed						
1041	5.66		and sand on one side of PVC was further eroded. TD (field geologist)						
1051	4.16		suggested may be a void to side of well (or filter pack may be						
			settling due to well development efforts.)						
1057	9.16	6 gal	Surge then pump well - dewatered						
1058	8.67		time recovery rate						
1059	7.73								
1059:30	7.57								
1100:00	7.30								
1100:30	7.06								
1101:00	6.86								
1110	5.56	8.5 gal	1.5 gal/min	10.5	7.38	0.064	9.60	over limit	no sheen
1125	4.75	9.5 gal	1l/6sec	9.75	6.85	0.062	12.45	over limit	

Tt NUS Form 0013

6.2 x .163

9.95

9.75

1.01 gal = 1 well volume

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: MW-09

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/22/05

WEATHER: Sunny, windy

Well Screen Depth: _____ / _____ ft. bgs

H&S Monitoring Instrument Reading _____

Pump Type/Material: Whale Pump

Pump Intake Depth: _____

Total Purge Volume = _____ (gal)

Data Recorded By: L. Seydewitz

Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Comments
1435	5.40		Begin surging. Cycle between pumping and surging. Soft bottom noted.						Dark grey, opaque sheen
1436		2 gal	Pump well dry - wait to recover.						
1440		3 gal	Pump well dry again						
1440:30	9.8		Can hear water pouring in. Timing recharge rate.						
1441:00	9.0								
1441:30	8.45		Silt, some fine sand noted on bottom of bucket.						
1442:00	7.8								
1442:30	7.1								
1443:00	6.45								
1443:30	5.86								
1444:00	5.58								
1444:30	5.52								
1445:00			Begin surging then pumping again. The well is able to maintain flow						
1452		5.5 gal	at varying velocity. Stop and let recharge fully.						
1455									
1456	8.86	7.0 gal	Pumped again and time recharge rate.						
1457	6.87								
1458	5.61								
1500			Surged and pumped well - water looks less opaque.						

Tt NUS Form 0013

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: MW-03

PROJECT: SWOS
PROJECT NO.: 5339-0540
PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/22/05
WEATHER: sunny, windy

Well Screen Depth: _____ / _____ ft. bgs
H&S Monitoring Instrument Reading _____

Pump Type/Material: Whole Pump
Pump Intake Depth: _____

Total Purge Volume = _____ (gal)
Data Recorded By: L. Seydewitz

Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	ORP	DO mg/L	Turbidity NTU	Comments
1509		12 gal		Surging well - pumping						
1517		17 gal								
1530		22 gal								
1535		27 gal								
1540		31 gal	1 liter/28 sec	8.56	6.56	0.076	67.0	3.92	200	light brown no sheen
1555	6.24	40 gal	1 liter/30 sec	8.37	6.58	0.078	21.3	3.26	55	
1556			Surged well and pumped.							
1610		48 gal		8.70	6.60	0.078	20.9	2.86	500	
1625	6.9	58 gal		8.37	6.59	0.078	23.3	2.82	90	
1640		67 gal		8.29	6.59	0.078	23.2	2.84	20	
1655		78 gal		8.23	6.59	0.078	25.5	2.66	8.8	no color, no sheen
End purge - End development -> turbidity below 10, temp not within 3% due to shifting sun/ shadows, weather, per FOL.										

Total Depth = 10.54'

Tt NUS Form 0013

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: MW-04

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/21/05

WEATHER: overcast, light showers

Well Screen Depth: _____ / _____ ft. bgs

H&S Monitoring Instrument Reading _____

Pump Type/Material: Whale Pump

Pump Intake Depth: _____

Total Purge Volume = _____ (gal)

Data Recorded By: L. Seydewitz

	Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	ORP	DO mg/L	Turbidity NTU	Comments
3/21	1355	5.00	Surge well using pump. Cycling between pumping and surging. Soft bottom.								Solid grey w/ sheen, petroleum odor, opaque
	1400	5.4									
	1401	6.9	well is dry → ~2.0 gal removed								
	1405	6.8	well is dry → ~2.0 gal removed								
	1411	5.04									
	1412	5.58									
	1412:30	6.82									
	1413:00	7.45	well is dry → ~2.0 gal removed								dark grey with sheen
	1420		10 gal	total removed. significant amount of silt, fine sand. Can feel hard bottom.							
	1422										
	1427		5 gal removed in 5 min								
3/22	1803	5.08	Surge well and pump. Well smells of petroleum.								solid dark grey, heavily sheen
	1808	~5.45	15 gal	water is clearing.							
	1810			Surge and pump dwell → opaque, heavy silt							
	1815		25	2 gal/min	7.10	6.10	0.074	-6.8	2.58	over limit	
	1820		35		7.11	6.56	0.073	-50.1	1.03	850	
	1823:00	5.1		checking	recharge	rate					
	1824:30	5.08									

Tt NUS Form 0013

Total Removed = 50 gal as of end of 3/22/05

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET.

Well No.: MW-04

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/23/05

WEATHER: overcast

Well Screen Depth: 3.4 / 10.4 ft. bgs

H&S Monitoring Instrument Reading: PID = 0.9 ppm, FID = 15.5 ppm (purge H_2O)

Pump Type/Material: Whale Pump

Pump Intake Depth:

Total Purge Volume = 225 (gal)

Data Recorded By: L. Seydewitz

Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	ORP	DO mg/L	Turbidity NTU	Comments
3/23 0843	5.03		Surge and pump well. Will pump from entire screen - not just the bottom							dark grey, opaque, sheen
0847			Begin pumping							
0852	5.57									
0857	5.63	15								
0902	5.78	25	2-gal/min							
0907			2-gal/min	7.16	6.57	0.071	-25.5	1.18	50	light grey, light sheen
0922		55		7.18	6.56	0.071	-48.9	0.61	9.5	
0937		85		7.19	6.54	0.070	-51.8	3.12	5.2	
0952		115		7.19	6.54	0.070	-53.1	0.49	2.9	no color, no sheen, petroleum odor
1007		145		7.19	6.55	0.069	-57.3	0.46	1.8	PID=0.9/FID=15.5 ppm
1022		175		7.19	6.55	0.069	-58.6	0.46	1.5	

End purge - End development. Water quality parameters are stable per the work plan.

Tt NUS Form 0013

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: MW-05

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/21/05

WEATHER: overcast

Well Screen Depth: _____ / _____ ft. bgs

H&S Monitoring Instrument Reading _____

Pump Type/Material: Whale Pump

Pump Intake Depth: _____

Total Purge Volume = 115 (gal)

Data Recorded By: L. Seydewitz

Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Comments
1645	5.4	Surge well using pump. Cycling between pumping and surging.							dark gray (opaque) petroleum odor. Sheen.
1646	6.4								
1647	7.48	2.5 gal -> removed (well dry)							
1651		5 gal total removed -> purged dry							
1653	7.12	timing to see recovery rate -> can hear water pouring into well							
1653:30	6.55	when removed pump							
1654:00	6.39								
1654:30	6.14		Silt and fine	sand noted	on bottom	of bucket.			
1655:00	5.75								
1656:00	5.63								
1657:00	5.56								
1658:00	5.54								
1700			sheen is lighter - not as dark as last one (5 gal bucket full)						
1703		5 gal removed - took 3 min to fill 5 gal bucket							
1705			light grey - slowly clearing. Bright sheen.						
1708		5 gal removed - took 3 min to fill 5 gal bucket							
1709	6.3								
1709:30	6.0								
1710:00	5.9								
1710:30	5.83								
~~1700~~ 1711:00	5.77								
1712	5.72								

Tt NUS Form 0013

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: MW-05

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/23/05

WEATHER: overcast

Well Screen Depth: _____ / _____ ft. bgs

H&S Monitoring Instrument Reading PID = 0.0 FID = 0.6

Pump Type/Material: Whale Pump

Pump Intake Depth: _____

Total Purge Volume = 115 (gal)

Data Recorded By: L. Seydewitz

	Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	ORP	DO mg/L	Turbidity NTU	Comments
3/23	1143	5.43		Begin surging. Cycle between pumping and surging							lighter grey color, opaque, light sheen
	1145			Begin pumping							
	1150		5 gal	silt and considerable sand - light grey rock flour in water							
	1204	7.53	30 gal								cloudy,
	1205	7.02		1 liter/9 sec	6.40	6.28	0.051	28.8	11.11	45	light sheen
	1220	6.93			6.53	6.03	0.051	29.8	5.74	10	no color or sheen; odor present.
	1235	7.2			6.66	6.04	0.051	27.3	3.21	10	
	1250	7.2			6.82	6.04	0.051	27.9	1.42	10	
	1305	7.2			6.83	6.03	0.051	28.2	1.39	10	
	1320	7.2	100		6.83	6.04	0.051	28.0	1.37	10	no color small sheen, petroleum odor

End purge - End development. Parameters stable.

Tt NUS Form 0013

TETRA TECH NUS, INC.

WELL DEVELOPMENT DATA SHEET

Well No.: (OFFTA-MW-05) OFF-MW05

PROJECT: SWOS

PROJECT NO.: 5339-0540

PERSONNEL: T. Dorgan, L. Seydewitz

DATE: 3/23/05

WEATHER: CLOUDY, DRY, 34°F

Well Screen Depth: _____ / _____ ft. bgs

H&S Monitoring Instrument Reading _____

Pump Type/Material: WHALE PUMP

Pump Intake Depth: BOTTOM OF WELL

Total Purge Volume = ~ 40 (gal)

Data Recorded By: T. Dorgan

Time	Water Level ft below top PVC	Volume mL	Flow Rate mL/min	Temp °C	pH	Sp Cond mS/cm	DO mg/L	Turbidity NTU	Comments
1250	6.64	TOT. DEPTH ~ 17.05' SOFT BOTTOM. SURGE WELL THEN START PUMP @							
1255	INITIAL PURGE WATER OPAQUE MED. BROWN VERY SILTY WITH GRASS FRAGMENTS/LEAF								
	LITTER.								
1312	STOP WHEN PUMPED DRY 2 TIMES. 10 GAL. PURGED. HAD TO CLEAN OF PUMP INTAKE SCREEN								
	CLOGGED W/ GRASS, WOOD, SAND + PVC SHAVINGS FROM WELL REPAIR. ALLOW TO RECHARGE.								
1410	STOP PUMPING ~35-40 GAL PURGED. STILL TURBID + CLOUDY, STILL PUMPING OUT FILTER-								
	PACK SIZED SAND ALONG W/ SILT + FINE SAND. NO ODOR, SHEEN NOTED. GRASS/LEAF								
	LITTER REDUCED, BUT STILL NOTED IN PURGE WATER. WELL IS PRODUCING @ A SLIGHTLY								
	INC. RATE. INIT. WELL DEWATER TO PUMP @ BOTTOM @ ~ EVERY 3-4 GALLONS, BY ~ 20 GAL.								
	PURGED, WELL WILL DEWATER TO PUMP @ ~ 8-10 GAL. THEN CONTINUE TO PUMP @ A REDUCED								
	RATE. TOT. DEPTH AFTER PURGE = 17.37' BTPVC.								

Tt NUS Form 0013

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: SWOS
Sample ID: SWOS-A-MW 01

Tetra Tech NUS Charge No. 5339-0540
QC: none (If applicable)

Sample Method: Peristaltic Pump
Depth Sampled: ~~87.5'~~ 8.6' Feet Screened Interval Depth 3.8-8.6 feet
Sample Date & Time: 3/29/04 0805 hours /Dup
Sampler(s): L. Seydewitz, T. Dorgan, K O'Neill
Data Recorded By: K O'Neill Signature: K O'Neill
Notes:

Top PVC MP = -0.41' Overcast, windy, cool

H&S Survey Meter N/R PPM Field Instrument Group A/B/C/D
Pre-pump insertion WL 4.85 ft Post - pump insertion WL ____ ft

Analysis	Bottle Lot #	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOC		Pest		Metals	
GRO		PCB			
SVOC		DRO			

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cumm. Volume Purged liters	Temp °C	Spec. Cond. 2 mS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
1010	4.85		whale pump	~1.5 gal		Pumped well dry - allowing to recover overnite *					
0805	3.79	Sampling	well		7.61	0.031	8.45	415.1	10.52	190	
	6.68 @ END										

TtNUS Form 0009

* very slow recovery

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: SWOS
Sample ID: SWOS-A-MW02

Tetra Tech NUS Charge No. 5339-0540
QC: none (If applicable)

Sample Method: 2" QED Bladder Pump
Depth Sampled: ~8.5' Feet Screened Interval Depth 4.18-10.18 feet
Sample Date & Time: 3/29/04 1135 hours /Dup
Sampler(s): L. Seydewitz, J. Dorgan, K. Mell
Data Recorded By: K. O'Neill Signature: Kevin O'Neill
Notes:

Top of PVC MP = -0.195'

H&S Survey Meter NR PPM
Pre-pump insertion WL 2.85 ft
Field Instrument Group A/B/C/D
Post - pump insertion WL NR ft

Analysis	Bottle Lot #	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOC		Pest		Metals	
GRO		PCB			
SVOC		DRO			

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cumm. Volume Purged liters	Temp °C	Spec. Cond. 2 mS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
1000	2.85	STARTED PURGE									
1013	2.88		Rinsed out cell		8.07	0.065	6.87	110.8	2.27	180	
1025	3.08		90	flow	8.25	0.066	6.70	-52.8	1.96	280	
1037	3.23		130	> rate	7.92	0.065	6.63	-68.5	1.68	70	
1047	3.22		130		8.08	0.064	6.56	-115.8	1.67	45	
1052	3.28		130	flow < rate	* 8.40	0.064	6.54	-117.9	1.75	31	
1057	3.29 KO		110		* 8.33	0.063	6.48	-124.3	1.87	26	
1103	3.24		110		* 8.36	0.063	6.44	-124.3	1.93	20	
1108	3.24		110		* 8.90	0.063	6.42	-106.1	2.31	21	
1115	3.22		110		* 8.24	0.062	6.40	-112.4	1.99	20	
1120	3.23		110		8.81	0.062	6.41	-99.3	2.00	13	
1125	3.23		110		* 8.37	0.062	6.40	-104.7	1.98	12	
1129	3.24		110		* 8.73	0.061	6.39	-106.6	2.00	11	
1135	Started sampling until 1226 6 bottles full										

TtNUS Form 0009

Temp. fluctuations from ambient conditions
Had been cloudy but
* Sun increasing, warming cell
flow thru

KO 3/29/04

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: SWOS
Sample ID: SWOS-A-MW03

Tetra Tech NUS Charge No. 5339-0540
QC: none (If applicable)

Sample Method: Bladder Pump
Depth Sampled: 9.6 Feet Screened Interval Depth 3.69-10.69 feet
Sample Date & Time: 3/28/05 1600 hours N/A /Dup
Sampler(s): L. Seydewitz, ~~F. Dorgan~~ 3/28/05
Data Recorded By: L. Seydewitz Signature: L. Seydewitz
Notes:

	In hole	B2	
FID =	0.0	0.0	ppm
PID =	0.0	0.0	ppm

H&S Survey Meter FID 0.0 PID 0.0 PPM
Pre-pump insertion WL 5.21 ft
Field Instrument Group A/B/C/D
Post - pump insertion WL 5.27 ft

Analysis	Bottle Lot #	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOC		Pest		Metals	
GRO		PCB			
SVOC		DRO			

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cumm. Volume Purged liters	Temp °C	Spec. Cond. 2 uS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
1440	5.27		Begin purging, adjust flow rate, fill flow thru cell								dark brown
1500	5.27	CPM 4	340		8.94	0.078	6.63	15.7	1.53	90	no color, no odor
1505	5.27				8.67	0.078	6.64	-3.4	1.02	50	
1510	5.27				8.61	0.078	6.61	1.1	0.77	35	
1515	5.27				8.59	0.078	6.61	-0.8	0.72	27	
1520	5.27				8.58	0.079	6.63	-0.9	0.68	21	
1525	5.27			3.5 gal	8.57	0.079	6.63	-3.9	0.63	8.2	
1530	5.27				8.56	0.079	6.61	5.4	0.57	7.5	
1535	5.27				8.57	0.079	6.62	3.6	0.54	5.0	
1540	5.27				8.57	0.079	6.61	2.2	0.53	4.1	
1545	5.27				8.56	0.079	6.61	1.2	0.52	3.6	
1550	5.27				8.57	0.079	6.61	0.9	0.53	3.5	
1555	5.27			7.5 gal	8.57	0.079	6.61	0.6	0.52	3.5	no color, no odor
End purge - Parameters stable per work plan - collect sample											

TtNUS Form 0009

CPM 4 -> 10:5 (4 cycles per minute)

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: SWOS
Sample ID: SWOS-A-MW04

Tetra Tech NUS Charge No. 5339-0540
QC: MS/MSD (If applicable)

Sample Method: Bladder pump w/ teflon line
Depth Sampled: 9.4 Feet Screened Interval Depth 3.4-10.4 feet
Sample Date & Time: 3/29/04 0830 hours N/A /Dup
Sampler(s): L. Seydewitz, T. Dorgan
Data Recorded By: L. Seydewitz/K. O'Neill Signature: L. Seydewitz
Notes:

FID PID
H&S Survey Meter 0.0 0.0 PPM Field Instrument Group A (B) C/D
Pre-pump insertion WL 4.68 ft Post - pump insertion WL 4.70 ft

Analysis	Bottle Lot #	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOC		SVOC		Metals	
GRO		Pest			
DRO		PCB			

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cumm. Volume Purged liters	Temp °C	Spec. Cond. 2 µS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
0720	4.70	Started purging, water has a lot of fines so pumping w/o flow cell to clear									
0755	4.72	CPM 5	380	3 gal	7.79	0.078	6.60	-22.0	0.52	5.5	clear, no odor
0800	4.72	↓	↓		7.79	0.077	6.51	-28.0	0.41	3.2	
0805	4.72				7.79	0.077	6.52	-29.8	0.40	3.0	
0810	4.72				7.78	0.077	6.52	-31.7	0.39	3.1	
0815	4.72				7.78	0.077	6.52	-32.3	0.37	2.7	
0820	4.72				7.79	0.076	6.53	-33.1	0.35	2.8	
0825	4.72	↓	↓	6 gal	7.79	0.076	6.53	-33.8	0.34	2.7	no color, no odor
End purge - Water quality parameters are stable per work plan. Collect sample											

TtNUS Form 0009

CPM 5 8:4

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: SWOS
Sample ID: SWOS-A-MW05

Tetra Tech NUS Charge No. 5339-0540
QC: Dup01 (If applicable)

Sample Method: Bladder Pump
Depth Sampled: _____ Feet Screened Interval Depth _____ feet
Sample Date & Time: 3/28/05 1200 hours 1205 /Dup
Sampler(s): L. Seydewitz, ~~T. Dorgan~~ 3/28/05
Data Recorded By: L. Seydewitz Signature: L. Seydewitz
Notes: Inhole
FID 0.0 ppm
PID 2.8 ppm

H&S Survey Meter FID 0.0 PID 0.0 PPM
Pre-pump insertion WL 4.60 ft
Field Instrument Group A/B/C/D
Post - pump insertion WL 4.62 ft

Analysis	Bottle Lot #	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOC		SVOC		Metals	
GRO		Pest			
DRO		PCB			

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cumm. Volume Purged liters	Temp °C	Spec. Cond. 2 µS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
1040	4.62	Begin purging, fill flow thru cell, adjust flow rate.									brown particles light sheen
1055	4.62	CPM 4	330		7.02	0.036	6.03	110.4	2.71	40	no color/ no sheen
1100	4.62				6.95	0.039	5.94	96.9	2.02	24	
1105	4.62				6.92	0.040	5.94	89.1	1.72	21	
1110	4.62				6.94	0.042	6.01	78.0	1.44	15	
1115	4.62				6.90	0.042	6.03	74.7	1.44	14	
1120	4.62			4 gal	6.88	0.043	6.04	70.1	1.22	11	
1125	change out nitrogen tank								~~1.29~~ 1.22		
1130	4.62				6.89	0.043	6.10	64.2	1.24	9.2	
1135	4.62				6.92	0.043	6.12	64.2	1.07	8.7	
1140	4.62				6.93	0.045	6.13	64.1	1.05	8.5	
1145	4.62				6.94	0.045	6.13	64.2	1.05	8.3	
1150	4.62			6 gal	6.94	0.045	6.14	64.3	1.03	8.3	no color, no sheen
End purge - Water quality parameters stable per work plan - collect sample.											

TtNUS Form 0009

CPM 4 = 10/5 (4 cycles per minute)
weather => mostly cloudy, intermittant sun, wind

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: SWOS
Sample ID: ~~SWOS A-MW~~ OFF-A-MWOS
10

Tetra Tech NUS Charge No. 5339-0540
QC: none (If applicable)

Sample Method: 2" QED Bladder Pump Teflon tubing + bladder
Depth Sampled: 11 Feet Screened Interval Depth _____ feet
Sample Date & Time: 3/29/04 1407 hours _____ /Dup
Sampler(s): L. Seydewitz, T. Dorgan K O'Neill
Data Recorded By: KO Signature: Kevin O'Neill
Notes:

H&S Survey Meter 0 PPM
Pre-pump insertion WL _____ ft
Field Instrument Group A/B/C/D
Post - pump insertion WL 5.72 ft

Analysis	Bottle Lot #	Analysis	Bottle Lot #	Analysis	Bottle Lot #
VOC		Pest		Metals	
GRO		PCB			
SVOC		DRO			

TOP of PVC M.P. -0.15'

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cumm. Volume Purged liters	Temp °C	Spec. Cond. 2 mS/cm KO	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
5.72	1455 Started Purge										
6.80	1503		450		11.15	0.068	6.60	224.6	1.10	110	
1508	6.75	Equalized flow rate			~adjusted a few times over this period						
1518	6.55		330		11.22	0.068	6.61	233.8	0.98	28	
1526	6.47		325		11.32	0.068	6.61	255.5	0.96	21	
1534	6.48		325		11.36	0.068	6.58	239.1	0.96	13	
1539	6.50		325		11.35	0.068	6.59	239.9	0.88	11	
1544	6.57		325	11.37	11.37	0.068	6.60	239.5	0.94	7.8	
1549	6.57		—		11.38	0.068	6.60	240.1	0.96	6.4	
1553	6.47		325		11.40	0.068	6.59	239.3	0.87	6.0	
1558	6.47				11.41	0.068	6.59	239.9	0.86	5.1	
1402	6.47		325		11.40	0.068	6.60	240.0	0.85	5.0	
1405	6.47		325		11.43	0.068	6.59	241.3	0.84	4.8	
1407	6.47	SAMPLED									

TtNUS Form 0009

Adjacent to Generator?

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: MW-01 PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1250 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan

L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING: PID(in hole) = 0.0 ppm FID(in hole) = 0.0 ppm (BZ 0.00/0.00)

LEL/02 READING: NA

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC) 8.42 (firm bottom)

WATER LEVEL DEPTH (FEET FROM TOP OF PVC) 5.05'

WELL STICK-~~UP~~ DOWN 0.4

CASING STICK-UP (FEET) flushmount in pavement

WELL DIAMETER (INCHES) 2" PVC

WELL CONSTRUCTION (PVC, STEEL, ETC.) PVC

LOCKED UPON ARRIVAL?	YES	(NO)
LOCKED REPLACED?	YES	(NO)
OBSTRUCTIONS?	YES	(NO)
WELL RELABELED?	(YES)	NO
SLUG TEST CONDUCTED?	YES	(NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: No LNAPL. Loss of signal at 2.2'. Total depth is 8.42'. No breather hole. Monitoring well labeled with paint pen. Located in parking lot. Notched measuring hole.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: MW-02 PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1300 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan

L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING: PID (in hole) = 0.0 ppm FID (in hole) = 0.0 ppm

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC)	9.95' (firm bottom)
WATER LEVEL DEPTH (FEET FROM TOP OF PVC)	3.68'
WELL STICK-~~UP~~ Down	0.23
CASING STICK-UP (FEET)	flushmount
WELL DIAMETER (INCHES)	2"
WELL CONSTRUCTION (PVC, STEEL, ETC.)	PVC

LOCKED UPON ARRIVAL?	YES	(NO)
LOCKED REPLACED?	YES	(NO)
OBSTRUCTIONS?	YES	(NO)
WELL RELABELED?	(YES)	NO
SLUG TEST CONDUCTED?	YES	(NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Has vent hole and measurement notch. No LNAPL. Loss of signal at 8.8'. Located in grass, next to sidewalk. Labeled with paint pen. Roadbox = 6". Surface seal = 8" diameter.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: HW-03

PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1345

PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING:

	hole	BZ
FID	1.5	0.0
PID	2.2	0.0

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC): 9.92 (soft bottom)

WATER LEVEL DEPTH (FEET FROM TOP OF PVC): 5.4

WELL STICK-~~UP~~ Down: 1.5

CASING STICK-UP (FEET): flushmount (pavement)

WELL DIAMETER (INCHES): 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.): PVC

LOCKED UPON ARRIVAL?	YES	(NO)
LOCKED REPLACED?	YES	(NO)
OBSTRUCTIONS?	YES	(NO)
WELL RELABELED?	(YES)	NO
SLUG TEST CONDUCTED?	YES	(NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Notch for measurement and vent noted. No LNAPL. Loss of signal at 2.55. Soft, squishy bottom. Probe bottom covered w/ silt and light sheen.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: MW-04 PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1310 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING: In hole PID = 26.6 FID = 48.2 BZ PID = 0.0 FID = 0.0 ppm

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC)	9.65 (very soft bottom)
WATER LEVEL DEPTH (FEET FROM TOP OF PVC)	5.01'
WELL STICK-~~UP~~ Down	0.24
CASING STICK-UP (FEET)	flushmount in pavement
WELL DIAMETER (INCHES)	2"
WELL CONSTRUCTION (PVC, STEEL, ETC.)	PVC

LOCKED UPON ARRIVAL?	YES	(NO)
LOCKED REPLACED?	YES	(NO)
OBSTRUCTIONS?	YES	(NO)
WELL RELABELED?	(YES)	NO
SLUG TEST CONDUCTED?	YES	(NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: No LNAPL. Loss of signal at 7.15. Soft bottom → probe retrieved covered with sheen/mud, smells of petroleum. Notch measuring point and vent hole.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: MW-05 PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1350 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan

L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING:

	3/31 Hole	BZ
FID	0.0	0.0
PID	3.2	0.0

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC) 8.55 (soft bottom)

WATER LEVEL DEPTH (FEET FROM TOP OF PVC) 5.38

WELL STICK-~~UP~~ Down 0.16

CASING STICK-UP (FEET) flushmount (grass)

WELL DIAMETER (INCHES) 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.) PVC

LOCKED UPON ARRIVAL?	YES	(NO)
LOCKED REPLACED?	YES	(NO)
OBSTRUCTIONS?	YES	(NO)
WELL RELABELED?	(YES)	NO
SLUG TEST CONDUCTED?	YES	(NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Located on grass next to Taylor Drive. Measurement notch noted. Probe tip smells of petroleum. Soft bottom - silted in. Loss of signal at 7.5. Probe tip has silt sheen (grey).

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: OFFTA-MW-05 (old)

PROJECT NAME: SWOS

DATE/TIME: 3/21/05

PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING: Inhole PID=0.0 FID=0.0 BZ PID=0.0 FID=0.0

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC) 17.3' (soft bottom)

WATER LEVEL DEPTH (FEET FROM TOP OF PVC) 6.52'

WELL STICK-UP

CASING STICK-UP (FEET) flushmount

WELL DIAMETER (INCHES) 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.) PVC

LOCKED UPON ARRIVAL?	YES	(NO)
LOCKED REPLACED?	YES	NO
OBSTRUCTIONS?	YES	(NO)
WELL RELABELED?	YES	(NO)
SLUG TEST CONDUCTED?	YES	(NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: New roadbox installed. Old PVC and roadbox heaved. When replaced, cut PVC and slip coupling installed → need to resurvey
Loss of signal at 7.65'. Soft bottom – probe end has twigs, sand attached to it.
Labeled as OFFTA-MW-05.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: MW-65

PROJECT NAME: SWOS

DATE/TIME: 3/18/05 1100

PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING: N/A

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

		3/21/05 @ 1325
WELL DEPTH (FEET FROM TOP OF PVC)	8.75	
WATER LEVEL DEPTH (FEET FROM TOP OF PVC)	6.78	7.29
WELL STICK-UP		
CASING STICK-UP (FEET)		
WELL DIAMETER (INCHES)	2"	
WELL CONSTRUCTION (PVC, STEEL, ETC.)	PVC	

LOCKED UPON ARRIVAL?	(YES)	NO	lock present but not locked tight
LOCKED REPLACED?	YES	(NO)	
OBSTRUCTIONS?	YES	(NO)	
WELL RELABELED?	YES	(NO)	
SLUG TEST CONDUCTED?	YES	(NO)	(If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Water present (~3") around PVC. Slight heaving noted of concrete base surrounding well. Bottom observed to be firm - checked w/ interface probe.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: MW-6R

PROJECT NAME: SWOS

DATE/TIME: 3/18/05 1105

PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING: N/A

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

	3/18/05	3/21/05 @ 1330
WELL DEPTH (FEET FROM TOP OF PVC)	25.5	25.5
WATER LEVEL DEPTH (FEET FROM TOP OF PVC)	7' (H_2O signal stopped at 9')	7.4
WELL STICK-~~UP~~ down		
CASING STICK-UP (FEET)	flushmount (on grass)	
WELL DIAMETER (INCHES)	2"	
WELL CONSTRUCTION (PVC, STEEL, ETC.)	PVC	

LOCKED UPON ARRIVAL?	(YES)	NO
LOCKED REPLACED?	YES	(NO)
OBSTRUCTIONS?	YES	(NO)
WELL RELABELED?	YES	(NO)
SLUG TEST CONDUCTED?	YES	(NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Casing/concrete around PVC well significantly heaved up (~8-10"). No water present around PVC. Bottom firm - checked w/ interface probe.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: TD-01 PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1410 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING:

	In hole	Bz
FID	0.0	0.0
PID	0.0	0.0

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC) 11.54

WATER LEVEL DEPTH (FEET FROM TOP OF PVC) 5.25

WELL STICK-~~UP~~ Down

CASING STICK-UP (FEET) flushmount (pavement)

WELL DIAMETER (INCHES) 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.) PVC

LOCKED UPON ARRIVAL? YES (NO) Lock present but not locked

LOCKED REPLACED? YES NO

OBSTRUCTIONS? YES (NO)

WELL RELABELED? YES (NO)

SLUG TEST CONDUCTED? YES (NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: 7.45 → loss of signal. Located at West end of Taylor Drive, Firm bottom. Probe tip smells like gasoline - clean (no silt/bentonite). Bentonite around top of PVC → some may be in well. Compression cap doesn't fit on tight. Across from bldg 143.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: TD-02 PROJECT NAME: SWOS

DATE/TIME: 3/18/05 1305 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan

L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING: No readings (FID = 0.0 ppm / PID = 0.0 ppm)

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

		3/21/05
WELL DEPTH (FEET FROM TOP OF PVC)	11.25	10.7
WATER LEVEL DEPTH (FEET FROM TOP OF PVC)	4.0 (9.1 signal stopped)	4.06
WELL STICK-UP		
CASING STICK-UP (FEET)	flushmount (pavement)	
WELL DIAMETER (INCHES)	2"	
WELL CONSTRUCTION (PVC, STEEL, ETC.)	PVC	

LOCKED UPON ARRIVAL?	(YES)	NO
LOCKED REPLACED?	(YES)	NO
OBSTRUCTIONS?	(YES)	NO
WELL RELABELED?	YES	NO
SLUG TEST CONDUCTED?	YES	(NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Flushmount well located on Taylor Drive @ corner of site. Bentonite above and around covered PVC - pressure cap is not on tight. Removed bentonite from around PVC and took water level w/ interface probe. Bottom soft - bentonite noted on probe end when retrieved from well. Well cover had been partially paved over.

Signal stopped @ 6.2 (3/21/05). Probe tip smells of petroleum/bentonite on tip. Roadbox → 1 screws broken/not sealed

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

WELL NUMBER: TD-03 PROJECT NAME: SWOS

DATE/TIME: 3/18/05 1300 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan

L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING: N/A

3/21/05	hole	BZ
FID	0.0	0.0
PID	0.0	0.0

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

		3/21/05 @ 1430
WELL DEPTH (FEET FROM TOP OF PVC)	11.4	11.48
WATER LEVEL DEPTH (FEET FROM TOP OF PVC)	4.02 (lost signal 6.15)	4.11
WELL STICK-UP	flushmount	
CASING STICK-UP (FEET)		
WELL DIAMETER (INCHES)	2"	
WELL CONSTRUCTION (PVC, STEEL, ETC.)	PVC	

LOCKED UPON ARRIVAL?	(YES)	NO
LOCKED REPLACED?	(YES)	NO
OBSTRUCTIONS?	(YES)	NO
WELL RELABELED?	YES	NO
SLUG TEST CONDUCTED?	YES	(NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Flushmount well located on Taylor Drive. Bentonite present above and on top of covered PVC. Removed bentonite, replaced pressure top. Soft bottom - clay/silt noted on end of probe when removed from bottom of well.

Loss of signal @ 6.35 (3/21/05). Soft bottom. Interior of PVC black. Probe smells of petroleum / has rust colored sediment on it.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

OFFTA

WELL NUMBER: HLO-~~105~~ 1R

PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1515

PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING:

	Hole	BZ
PID	0.0	0.0
FID	0.0	0.0

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC): 13.42 (firm bottom)

WATER LEVEL DEPTH (FEET FROM TOP OF PVC): 6.18

WELL STICK-~~UP~~ Down

CASING STICK-UP (FEET): flushmount (grass)

WELL DIAMETER (INCHES): 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.): PVC

LOCKED UPON ARRIVAL? YES (NO)

LOCKED REPLACED? YES (NO)

OBSTRUCTIONS? YES (NO)

WELL RELABELED? YES (NO)

SLUG TEST CONDUCTED? YES (NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Located at eastern end of site, near pier. No lock. Compression cap on tight. Surface seal is good. Loss of signal = 8.4

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

OFFTA

WELL NUMBER: MW-11S

PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1510

PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING:

	Hole	BZ	
PID	0.0	0.0	ppm
FID	0.0	0.0	ppm

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC): 8.8 (firm bottom)

WATER LEVEL DEPTH (FEET FROM TOP OF PVC): 3.79

WELL STICK-~~UP~~ Down

CASING STICK-UP (FEET): flushmount (grass)

WELL DIAMETER (INCHES): 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.): PVC

LOCKED UPON ARRIVAL? (YES) NO Lock present but not locked

LOCKED REPLACED? YES (NO)

OBSTRUCTIONS? YES (NO)

WELL RELABELED? YES (NO)

SLUG TEST CONDUCTED? YES (NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Located west of outfall next to MW-11R. Water in well casing but not over PVC with compression cap and lock. Inside of PVC clean. Surface seal heaved up. Loss of signal = 6.5

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

OFFTA

WELL NUMBER: MW-11R

PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1505

PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

		Hole	BZ	
MONITORING INSTRUMENT READING:	PID	0.0	0.0	ppm
	FID	0.0	0.0	ppm

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC) 20.30 firm bottom

WATER LEVEL DEPTH (FEET FROM TOP OF PVC) 3.60

WELL STICK-~~UP~~ Down

CASING STICK-UP (FEET) flushmount (grass)

WELL DIAMETER (INCHES) 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.) PVC

LOCKED UPON ARRIVAL? YES (NO)

LOCKED REPLACED? YES (NO)

OBSTRUCTIONS? YES (NO)

WELL RELABELED? YES (NO)

SLUG TEST CONDUCTED? YES (NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Clean on inside of well. Compression on tight. Located west of outfall (old baseball diamond). Loss of signal 3/23/05 5.75'

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

OFFTA

WELL NUMBER: MW-102 PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1500 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan
L. Seydewitz

VENT WELL

		Hole	BZ
MONITORING INSTRUMENT READING:	FID	0.0	0.0
	PID	0.0	0.0

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC) 11.78 (firm bottom)

WATER LEVEL DEPTH (FEET FROM TOP OF PVC) 5.53

WELL STICK-~~UP~~ Down

CASING STICK-UP (FEET) flushmount (grass)

WELL DIAMETER (INCHES) 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.) PVC

LOCKED UPON ARRIVAL? YES (NO)

LOCKED REPLACED? YES (NO)

OBSTRUCTIONS? YES (NO)

WELL RELABELED? YES (NO)

SLUG TEST CONDUCTED? YES (NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Loss of signal at 7.65. No lock - compression cap on but loose. Inside of PVC clean. Located between outfall pipe and SB429.

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

OFFTA

WELL NUMBER: HW-105 PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1945 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan

L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING:

	hole	BZ
FID	0.0	0.0
PID	0.0	0.0

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC) 11.59

WATER LEVEL DEPTH (FEET FROM TOP OF PVC) 7.13

WELL STICK-UP

CASING STICK-UP (FEET) flushmount (grass)

WELL DIAMETER (INCHES) 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.) PVC

LOCKED UPON ARRIVAL?	YES	(NO) Lock present / compression cap p.
LOCKED REPLACED?	YES	NO
OBSTRUCTIONS?	YES	NO
WELL RELABELED?	YES	NO
SLUG TEST CONDUCTED?	YES	NO (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: Loss of signal @ 7.25'. Firm bottom. Located due north of Pavilion (fire pit) and east of excavation. (OFFTA site)

Tt NUS Form 0021

TETRA TECH NUS, INC.

WELL INSPECTION AND GROUNDWATER LEVEL MEASUREMENT SHEET

(OFFTA)

WELL NUMBER: MW-2 (not sure if 2S or 2R) PROJECT NAME: SWOS

DATE/TIME: 3/21/05 1450 PROJECT MANAGER: D. Chisholm

INSPECTED BY: T. Dorgan

L. Seydewitz

VENT WELL

MONITORING INSTRUMENT READING:

	Hole	BZ
FID	0.0	0.0
PID	0.0	0.0

LEL/02 READING: N/A

WELL INSPECTION/GROUNDWATER LEVEL MEASUREMENT

WELL DEPTH (FEET FROM TOP OF PVC) 29.95 (soft bottom)

WATER LEVEL DEPTH (FEET FROM TOP OF PVC) 4.49

WELL STICK-UP

CASING STICK-UP (FEET) flushmount (grass)

WELL DIAMETER (INCHES) PVC => 2"

WELL CONSTRUCTION (PVC, STEEL, ETC.) PVC

LOCKED UPON ARRIVAL? YES (NO)

LOCKED REPLACED? YES (NO)

OBSTRUCTIONS? YES (NO) (water over PVC/cap) (screw on cap w/ o ring)

WELL RELABELED? YES (NO)

SLUG TEST CONDUCTED? YES (NO) (If YES, refer to "Hydraulic Conductivity Testing Data Sheet")

GENERAL CONDITION/COMMENTS: 3" of water above PVC cap. Inside of PVC clean. Located shoreline side of excavation. Between SB404 and SB429. Loss of signal = 6.62. (OFFTA)

Tt NUS Form 0021

TETRA TECH NUS INC.

FIELD MODIFICATION RECORD

Site Name: SWOS

Location: NAUSTA Newport

Project Number: 5339-0540

Task Assignment: Well Installation

To: D. CHISHOLM

Location: WILMINGTON, MA

Date: 3/18/05

Description: A total of 5, two inch flushmount monitoring wells will be installed in place of the 5 proposed microwells in order to comply with RIDEM regulations to have a site specific filter pack.

Reason for Change: Microwells installed using a GeoProbe do not have a site specific filter pack. In addition, 2 inch wells will assist in the well development and groundwater sample collection process in light of available low flow sample collection equipment (ie bladder pumps).

Recommended Action: Install 5 monitoring wells in place of the 5 proposed microwells.

Field Operations Leader (Signature): [signature]

Date: 3/18/05

Disposition/Action:

Project Manager (Signature): [signature]

Date: 7/25/05

Distribution:

		Others as Required:
Program Manager:	J. Trepanowski	
Project Manager:	D. Chisholm	
Quality Assurance Officer:		
Field Operations Leader:	T. Dorgan	
Project File:	5339	

Tt NUS Form 0003

Site Name: Surface Warfare Officers School
Naval Station, Newport
Date: 1/24/06
Weather: 40° - sunny, clear
High Tide: 1448
Low Tide: 0853

Project No. 5339-0342
Equipment No.:
Equipment Number:
Personnel: L. Seydewitz, J. Traut

Well ID	Elevation of Reference Point (MLW)	High Tide Measurement Time	Water Level Indicator Reading High Tide (Feet)	Low Tide Measurement Time	Water Level Indicator Reading Low Tide (feet)	Change in Water Level (Low Tide-High Tide)	NAPL Detection
74-MW01	NE	1555	4.27	NA	NA	NA	NA
74-MW02	NE	1556	5.61	NA	NA	NA	NA
74-MW03	NE	1558	6.76	NA	NA	NA	NA
ENSR-1	9.82	1639	3.82	1142	4.18	0.36	NS
ENSR-2	8.17	1646	3.85	1139	3.97	0.12	NS
ENSR-3	7.89	1650	4.68	1137	4.98	0.3	NS
MW-4S	7.68	1659	4.29	1131	4.61	0.32	NS
OFF-MW-05	12.4	1626	6.18	1214	6.19	0.01	NS
OFF-MW-102	8.49	1706	4.43	1128	5.12	0.69	NS
OFF-MW-10S	10.36	1716	6.32	1124	6.7	0.38	NS
OFF-MW-11R	7.38	NF	NF	NF	NF	NF	NS
OFF-MW-11S	7.7	1702	3.43	1130	3.51	0.08	NS
OFF-MW-1R	11.39	1722	5.77	1122	5.82	0.05	NS
OFF-MW-2D	8.59	1710	4.16	1127	4.37	0.21	NS
OFF-MW-6R	13.46	1622	6.75	1212	6.79	0.04	NS
OFF-MW-6S	13.53	1620	6.78	1211	6.76	-0.02	NS
PZ-01	11.59	1657	8.81	1133	9.03	0.22	NS
PZ-02	11.01	1655	7.82	1134	8.55	0.73	NS
PZ-03	7.47	NA	NA	NA	NA	NA	NA
SD-1	7.23	1731	4.49	NA	NA	NA	NA
SD-2	9.8	1735	3.99	NA	NA	NA	NA
SWOS-MW01	12.03	1615	4.89	1207	4.9	0.01	NS
SWOS-MW02	12.01	1608	3.16	1204	3.19	0.03	NS
SWOS-MW03	11.21	1629	5.43	1215	5.48	0.05	NS
SWOS-MW04	11.06	1631	4.84	1216	4.86	0.02	NS
SWOS-MW05	10.21	1634	5	1217	5.01	0.01	NS
Well next to 2-D	NE	1713	4.65	1126	5.25	0.6	NS

Notes:
NA= Did not take measurements
NF= Could not find well
NE= Do not have surveyed elevations for wells
NS= No signal on oil/water interface probe
Shaded Cells= > 0.1 difference between low and high tide water levels

APPENDIX D

ANALYTICAL RESULTS

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB02	SWOS-S-SB02	SWOS-S-SB03
	SAMPLE NUMBER	SWOS-S-SB01-0103	SWOS-S-SB01-0103-D	SWOS-S-SB01-0507	SWOS-S-SB02-0103	SWOS-S-SB02-0305	SWOS-S-SB03-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER	Field Dup.	Field Dup.				
	DUPLICATE		SWOS-S-SB01-0103				
PARAMETER	**PAL** [(1)]						
VOLATILES BY METHOD 8260B (UG/KG)							
1,1,1-TRICHLOROETHANE	120000	4 U	4 U	3 U	6 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	410	4 U	4 U	3 U	6 U	5 U	5 U
1,1,2-TRICHLOROETHANE	730	4 U	4 U	3 U	6 U	5 U	5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	560000	4 U	4 U	3 U	6 U	5 U	5 U
1,1-DICHLOROETHANE	51000	4 U	4 U	3 U	6 U	5 U	5 U
1,1-DICHLOROETHENE	200[(2)]	4 U	4 U	3 U	6 U	5 U	5 U
1,2,4-TRICHLOROBENZENE	65000	4 U	4 U	3 U	6 U	5 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	450	4 UJ	4 UJ	3 UJ	6 U	5 U	5 U
1,2-DIBROMOETHANE	6.9	4 U	4 U	3 U	6 U	5 U	5 U
1,2-DICHLOROBENZENE	37000	4 U	4 U	3 U	6 U	5 U	5 U
1,2-DICHLOROETHANE	280	4 U	4 U	3 U	6 U	5 U	5 U
1,2-DICHLOROPROPANE	340	4 U	4 U	3 U	6 U	5 U	5 U
1,3-DICHLOROBENZENE	1600	4 U	4 U	3 U	6 U	5 U	5 U
1,4-DICHLOROBENZENE	3400	4 U	4 U	3 U	6 U	5 U	5 U
2-BUTANONE	730000	4 UJ	4 UJ	3 UJ	6 UJ	5 UJ	5 UJ
2-HEXANONE		4 UJ	4 UJ	3 UJ	6 U	5 U	5 U
4-METHYL-2-PENTANONE	79000	4 U	4 U	3 U	6 U	5 U	5 U
ACETONE	160000	11 UJ	28 UJ	48 UJ	14 UJ	21 UJ	19 UJ
BENZENE	600	4 U	4 U	3 U	6 U	5 U	5 U
BROMODICHLOROMETHANE	820	4 U	4 U	3 U	6 U	5 U	5 U
BROMOFORM	62000	4 U	4 U	3 U	6 UJ	5 UJ	5 UJ
BROMOMETHANE	390	4 U	4 U	3 U	6 U	5 U	5 U
CARBON DISULFIDE	36000	4 U	4 U	3 U	6 U	5 U	5 U
CARBON TETRACHLORIDE	250	4 U	4 U	3 U	6 U	5 U	5 U
CHLOROBENZENE	15000	4 U	4 U	3 U	6 U	5 U	5 U
CHLORODIBROMOMETHANE	1100	4 U	4 U	3 U	6 U	5 U	5 U
CHLOROETHANE	3000	4 U	4 U	3 U	6 U	5 U	5 U
CHLOROFORM	360	4 U	4 U	3 U	6 U	5 U	5 U
CHLOROMETHANE	1200	4 U	4 U	3 U	6 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	4300	4 U	4 U	3 U	6 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE		4 U	4 U	3 U	6 U	5 U	5 U
CYCLOHEXANE	14000	4 U	4 U	3 U	6 U	5 U	5 U
DICHLORODIFLUOROMETHANE	9400	4 U	4 U	3 U	6 U	5 U	5 U
ETHYLBENZENE	8900	4 U	4 U	3 U	6 U	5 U	5 U
ISOPROPYLBENZENE	57000	4 U	4 U	3 U	6 U	5 U	5 U
METHYL ACETATE	2200000	4 UJ	4 UJ	3 UJ	6 U	5 U	5 U
METHYL CYCLOHEXANE	260000	4 U	4 U	3 U	6 U	5 U	5 U
METHYL TERT-BUTYL ETHER	62000	4 U	4 U	3 U	6 U	5 U	5 U
METHYLENE CHLORIDE	9100	12	10	12	13	4 J	5
O-XYLENE		4 U	4 U	3 U	6 U	5 U	5 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB02	SWOS-S-SB02	SWOS-S-SB03
	SAMPLE NUMBER	SWOS-S-SB01-0103	SWOS-S-SB01-0103-D	SWOS-S-SB01-0507	SWOS-S-SB02-0103	SWOS-S-SB02-0305	SWOS-S-SB03-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER	Field Dup.	Field Dup.				
	DUPLICATE		SWOS-S-SB01-0103				
PARAMETER	**PAL [1]**						
P-XYLENE		4 U	4 U	3 U	6 U	5 U	5 U
STYRENE	13000[2]	4 U	4 U	3 U	6 U	5 U	5 U
TETRACHLOROETHENE	1500	4 U	4 U	3 U	6 UJ	5 UJ	5 UJ
TOLUENE	52000	4 U	4 U	3 U	6 U	5 U	5 U
TOTAL XYLENES	27000	4 U	4 U	3 U	6 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	6900	4 U	4 U	3 U	6 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE		4 U	4 U	3 U	6 U	5 U	5 U
TRICHLOROETHENE	53	4 U	4 U	3 U	6 U	5 U	5 U
TRICHLOROFLUOROMETHANE	39000	4 U	4 U	3 U	6 U	5 U	5 U
VINYL CHLORIDE	20[2]	4 U	4 U	3 U	6 U	5 U	5 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)							
1,1-BIPHENYL		390 U	380 U	380 U	390 U	360 U	370 U
2,2'-OXYBIS(1-CHLOROPROPANE)	2900	390 U	380 U	380 U	390 U	360 U	370 U
2,4,5-TRICHLOROPHENOL	330000[2]	800 U	760 U	770 U	790 U	740 U	750 U
2,4,6-TRICHLOROPHENOL	610	390 U	380 U	380 U	390 U	360 U	370 U
2,4-DICHLOROPHENOL	18000	390 U	380 U	380 U	390 U	360 U	370 U
2,4-DIMETHYLPHENOL	120000	390 U	380 U	380 U	390 U	360 U	370 U
2,4-DINITROPHENOL	12000	800 U	760 U	770 U	790 U	740 U	750 U
2,4-DINITROTOLUENE	900[2]	390 U	380 U	380 U	390 U	360 U	370 U
2,6-DINITROTOLUENE	6100	390 U	380 U	380 U	390 U	360 U	370 U
2-CHLORONAPHTHALENE	490000	390 U	380 U	380 U	390 U	360 U	370 U
2-CHLOROPHENOL	6300	390 U	380 U	380 U	390 U	360 U	370 U
2-METHYLNAPHTHALENE		390 U	380 U	380 U	390 U	360 U	370 U
2-METHYLPHENOL	310000	390 U	380 U	380 U	390 U	360 U	370 U
2-NITROANILINE	170	800 U	760 U	770 U	790 U	740 U	750 U
2-NITROPHENOL		390 U	380 U	380 U	390 U	360 U	370 U
3,3'-DICHLOROBENZIDINE	1100	390 U	380 U	380 U	390 U	360 U	370 U
3-NITROANILINE		800 U	760 U	770 U	790 U	740 U	750 U
4,6-DINITRO-2-METHYLPHENOL		800 U	760 U	770 U	790 U	740 U	750 U
4-BROMOPHENYL PHENYL ETHER		390 U	380 U	380 U	390 U	360 U	370 U
4-CHLORO-3-METHYLPHENOL		390 U	380 U	380 U	390 U	360 U	370 U
4-CHLOROANILINE	24000	390 U	380 U	380 U	390 U	360 U	370 U
4-CHLOROPHENYL PHENYL ETHER		390 U	380 U	380 U	390 U	360 U	370 U
4-METHYLPHENOL	31000	390 U	380 U	380 U	390 U	360 U	370 U
4-NITROANILINE		800 U	760 U	770 U	790 U	740 U	750 U
4-NITROPHENOL		800 U	760 U	770 U	790 U	740 U	750 U
ACENAPHTHENE	43000[2]	400 U	380 U	380 U	400 U	47 J	370 U
ACENAPHTHYLENE	5600	390 U	380 U	380 U	390 U	79 J	40 J
ACETOPHENONE		390 U	380 U	380 U	390 U	360 U	370 U
ANTHRACENE	35000[2]	390 U	380 U	67 J	82 J	120 J	66 J
ATRAZINE	2200	390 U	380 U	380 U	390 U	360 U	370 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB02	SWOS-S-SB02	SWOS-S-SB03
	SAMPLE NUMBER	SWOS-S-SB01-0103	SWOS-S-SB01-0103-D	SWOS-S-SB01-0507	SWOS-S-SB02-0103	SWOS-S-SB02-0305	SWOS-S-SB03-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER	Field Dup.	Field Dup.				
	DUPLICATE		SWOS-S-SB01-0103				
PARAMETER	**PAL (1)**						
BENZALDEHYDE	610000	390 U	380 U	380 U	390 U	360 U	370 U
BENZO(A)ANTHRACENE	620	87 J	66 J	210 J	280 J	1100	580
BENZO(A)PYRENE	62	82 J	67 J	200 J	270 J	1300 J	670
BENZO(B)FLUORANTHENE	620	110 J	92 J	270 J	330 J	2500 J	820
BENZO(G,H,I)PERYLENE	800(2)	48 J	46 J	74 J	160 J	510 J	520
BENZO(K)FLUORANTHENE	900(2)	44 J	58 J	110 J	140 J	1100 J	330 J
BIS(2-CHLOROETHOXY)METHANE		390 U	380 U	380 U	390 U	360 U	370 U
BIS(2-CHLOROETHYL)ETHER	210	390 U	380 U	380 U	390 U	360 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	390 U	380 U	380 U	90 J	60 J	41 J
BUTYL BENZYL PHTHALATE	1200000	390 U	380 U	380 U	390 U	360 U	370 U
CAPROLACTAM	3100000	390 U	380 U	380 U	390 U	360 U	370 U
CARBAZOLE	24000	390 U	380 U	380 U	390 U	42 J	370 U
CHRYSENE	400(2)	79 J	69 J	220 J	310 J	1200	510
DIBENZO(A,H)ANTHRACENE	62	390 U	380 U	380 U	43 J	150 J	130 J
DIBENZOFURAN	29000	390 U	380 U	380 U	390 U	360 U	370 U
DIETHYL PHTHALATE	340000(2)	390 U	380 U	380 U	390 U	360 U	370 U
DIMETHYL PHTHALATE	1900000(2)	390 U	380 U	380 U	390 U	360 U	370 U
DI-N-BUTYL PHTHALATE	610000	390 U	380 U	380 U	390 U	360 U	370 U
DI-N-OCTYL PHTHALATE	240000	390 U	380 U	380 U	390 U	360 UJ	370 U
FLUORANTHENE	20000(2)	120 J	100 J	440	490	960	1000
FLUORENE	28000(2)	390 U	380 U	380 U	390 U	41 J	370 U
HEXACHLOROBENZENE	300	390 U	380 U	380 U	390 U	360 U	370 U
HEXACHLOROBUTADIENE	6200	390 U	380 U	380 U	390 U	360 U	370 U
HEXACHLOROCYCLOPENTADIENE	37000	390 U	380 U	380 U	390 U	360 U	370 U
HEXACHLOROETHANE	35000	390 U	380 U	380 U	390 U	360 U	370 U
INDENO(1,2,3-CD)PYRENE	620	42 J	40 J	76 J	140 J	530 J	480
ISOPHORONE	510000	390 U	380 U	380 U	390 U	360 U	370 U
NAPHTHALENE	5600	390 U	380 U	380 U	390 U	360 U	370 U
NITROBENZENE	2000	390 U	380 U	380 U	390 U	360 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	69	390 U	380 U	380 U	390 U	360 U	370 U
N-NITROSODIPHENYLAMINE	99000	390 U	380 U	380 U	390 U	360 U	370 U
PENTACHLOROPHENOL	3000	800 U	760 U	770 U	790 U	740 U	750 U
PHENANTHRENE	40000(2)	390 U	380 U	240 J	360 J	460	210 J
PHENOL	3700000	390 U	380 U	380 U	390 U	360 U	370 U
PYRENE	13000(2)	110 J	100 J	420	480	2200	1100
TOTAL PAHs		722	638	2327	3085	12297	6456

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB02	SWOS-S-SB02	SWOS-S-SB03
	SAMPLE NUMBER	SWOS-S-SB01-0103	SWOS-S-SB01-0103-D	SWOS-S-SB01-0507	SWOS-S-SB02-0103	SWOS-S-SB02-0305	SWOS-S-SB03-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER	Field Dup.	Field Dup.				
	DUPLICATE		SWOS-S-SB01-0103				
PARAMETER	**PAL** [1]						
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)							
DIESEL RANGE ORGANICS	500[2]	41	26	28	40	95	41
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)							
GASOLINE RANGE ORGANICS		3.6 U	2.0 U	1.7 U	1.8 U	2.6 U	2.2 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)							
4,4'-DDD	2400	3.9 U	3.8 U	3.8 U	3.9 U	3.6 U	3.7 U
4,4'-DDE	1700	3.9 UJ	3.8 UJ	3.8 U	3.9 U	3.6 U	3.7 U
4,4'-DDT	1700	3.9 UJ	3.8 UJ	3.8 U	3.9 U	3.6 U	3.7 U
ALDRIN	29	2 U	1.9 U	2 U	2 U	1.9 U	1.9 U
ALPHA-BHC	90	2 U	1.9 U	2 U	2 U	1.9 U	1.9 U
ALPHA-CHLORDANE		2 U	1.9 U	2 U	2 U	1.9 U	1.9 U
BETA-BHC	320	2 UJ	1.9 UJ	2 U	2 U	1.9 U	1.9 U
DELTA-BHC		2 U	1.9 U	2 U	2 U	1.9 U	1.9 U
DIELDRIN	30	3.9 U	3.8 U	3.8 U	3.9 U	3.6 U	3.7 U
ENDOSULFAN I		2 U	1.9 U	2 U	2 U	1.9 U	1.9 U
ENDOSULFAN II		3.9 U	3.8 U	3.8 U	3.9 U	3.6 U	3.7 U
ENDOSULFAN SULFATE		3.9 UJ	3.8 UJ	3.8 U	3.9 U	R	3.7 U
ENDRIN	1800	3.9 UJ	3.8 UJ	3.8 U	3.9 U	3.6 U	3.7 U
ENDRIN ALDEHYDE		3.9 U	3.8 U	3.8 U	3.9 U	3.6 U	3.7 U
ENDRIN KETONE		3.9 UJ	3.8 UJ	3.8 U	3.9 U	3.6 U	3.7 U
GAMMA-BHC (LINDANE)	440	2 U	1.9 U	2 U	2 U	1.9 U	1.9 U
GAMMA-CHLORDANE		2 U	1.9 U	2 U	2 U	1.9 U	1.9 U
HEPTACHLOR	110	2 U	1.9 U	2 U	2 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	53	2 U	1.9 U	2 U	2 U	1.9 U	1.9 U
METHOXYCHLOR	31000	20 U	19 U	20 U	20 U	22 J	19 U
TOXAPHENE	440	200 U	190 U	200 U	200 U	190 U	190 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)							
AROCLOR-1016	390	39 UJ	38 UJ	38 U	39 U	36 U	37 U
AROCLOR-1221	220	39 UJ	38 UJ	38 U	39 U	36 U	37 U
AROCLOR-1232		39 UJ	38 UJ	38 U	39 U	36 U	37 U
AROCLOR-1242		39 UJ	38 UJ	38 U	39 U	36 U	37 U
AROCLOR-1248		39 UJ	38 UJ	38 U	39 U	36 U	37 U
AROCLOR-1254		39 UJ	38 UJ	38 U	39 U	36 U	37 U
AROCLOR-1260		39 UJ	38 UJ	38 U	39 U	36 U	37 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB01	SWOS-S-SB02	SWOS-S-SB02	SWOS-S-SB03
	SAMPLE NUMBER	SWOS-S-SB01-0103	SWOS-S-SB01-0103-D	SWOS-S-SB01-0507	SWOS-S-SB02-0103	SWOS-S-SB02-0305	SWOS-S-SB03-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER	Field Dup.	Field Dup.				
	DUPLICATE		SWOS-S-SB01-0103				
PARAMETER	**PAL (1)**						
METALS BY METHOD 6010B (MG/KG)							
ALUMINUM	7600	13900	13100	7780	10300	8630	10800
ANTIMONY	3.1	0.085 UJ	0.24 UJ	0.29 UJ	0.68 UJ	0.44 UJ	0.35 UJ
ARSENIC	0.39	7.8 J	8.0 J	3.7 J	7.1 J	7.4 J	6.8 J
BARIUM	540	24.5 J	25.4 J	17.2 J	25.8 J	36.8 J	55.1 J
BERYLLIUM	0.4(2)	0.36 J	0.34 J	0.37 J	0.31 J	0.28 J	0.34 J
CADMIUM	3.7	0.0056 UJ	0.049 UJ	0.038 UJ	0.063 UJ	1.4 J	0.22 J
CALCIUM		1500	1450	938	1080	20800	1460
CHROMIUM	30	12.3 J	11.4 J	11.1	64.7	9.9	11.6 J
COBALT	900	13.0 J	14.9 J	26.2	9.3 J	46.9	10.0 J
COPPER	310	32.3	31.2	22.3	32.6	24.4	40.1
IRON	2300	32000	40500	21600	23300	17600	27300
LEAD	150(2)	43.5 J	36.6 J	53.0 J	74.0	151	361
MAGNESIUM		3310	3030	2150	1990	2560	2890
MANGANESE	180	648	689	442	297	193	377
NICKEL	160	18.5 J	16.8 J	11.1 J	13.9 J	10.1 J	14.5 J
POTASSIUM		275	279	339	322	391	388
SELENIUM	39	4.6 J	4.2 J	3.2 J	3.5 J	2.2 J	3.9 J
SILVER	39	0.019 UJ	0.018 UJ	0.018 UJ	0.019 UJ	1.0 UJ	0.019 UJ
SODIUM		41.4	39.7	57.7	55.7	146	49.6
THALLIUM	0.52	3.4 J	3.3 J	2.5 J	3.5 J	2.7 J	3.0 J
VANADIUM	55	19.3 J	19.4 J	12.8 J	20.1 J	13.6 J	16.4 J
ZINC	2300	63.2 J	61.1 J	51.3 J	69.4	427	239
METALS BY METHOD 7471A (MG/KG)							
MERCURY	2.3	0.033	0.34	0.033	0.76	0.12	0.17

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB03	SWOS-S-SB04	SWOS-S-SB04	SWOS-S-SB05	SWOS-S-SB05	SWOS-S-SB06
	SAMPLE NUMBER	SWOS-S-SB03-0305	SWOS-S-SB04-0103	SWOS-S-SB04-0507	SWOS-S-SB05-0103	SWOS-S-SB05-0305	SWOS-S-SB06-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** [(1)]						
VOLATILES BY METHOD 8260B (UG/KG)							
1,1,1-TRICHLOROETHANE	120000	3 U	4 U	5 U	4 U	6 U	4 U
1,1,2,2-TETRACHLOROETHANE	410	3 U	4 U	5 U	4 U	6 U	4 U
1,1,2-TRICHLOROETHANE	730	3 U	4 U	5 U	4 U	6 U	4 U
1,1,2-TRICHLOROTRIFLUOROETHANE	560000	3 U	4 U	5 U	4 U	6 U	4 U
1,1-DICHLOROETHANE	51000	3 U	4 U	5 U	4 U	6 U	4 U
1,1-DICHLOROETHENE	200[(2)]	3 U	4 U	5 U	4 U	6 U	4 U
1,2,4-TRICHLOROBENZENE	65000	3 U	4 U	5 U	4 U	6 U	4 U
1,2-DIBROMO-3-CHLOROPROPANE	450	3 U	4 U	5 U	4 U	6 U	4 UJ
1,2-DIBROMOETHANE	6.9	3 U	4 U	5 U	4 U	6 U	4 U
1,2-DICHLOROBENZENE	37000	3 U	4 U	5 U	4 U	6 U	4 U
1,2-DICHLOROETHANE	280	3 U	4 U	5 U	4 U	6 U	4 U
1,2-DICHLOROPROPANE	340	3 U	4 U	5 U	4 U	6 U	4 U
1,3-DICHLOROBENZENE	1600	3 U	4 U	5 U	4 U	6 U	4 U
1,4-DICHLOROBENZENE	3400	3 U	4 U	5 U	4 U	6 U	4 U
2-BUTANONE	730000	3 UJ	4 UJ	5 UJ	4 UJ	6 UJ	4 UJ
2-HEXANONE		3 U	4 U	5 U	4 U	6 U	4 UJ
4-METHYL-2-PENTANONE	79000	3 U	4 U	5 U	4 U	6 U	4 U
ACETONE	160000	20 UJ	14 UJ	66 UJ	170 UJ	210 U	23 UJ
BENZENE	600	3 U	4 U	5 U	4 U	6 U	4 U
BROMODICHLOROMETHANE	820	3 U	4 U	5 U	4 U	6 U	4 U
BROMOFORM	62000	3 UJ	4 UJ	5 UJ	4 UJ	6 UJ	4 U
BROMOMETHANE	390	3 U	4 U	5 U	4 U	6 U	4 U
CARBON DISULFIDE	36000	3 U	4 U	5 U	4 U	6 U	4 U
CARBON TETRACHLORIDE	250	3 U	4 U	5 U	4 U	6 U	4 U
CHLOROBENZENE	15000	3 U	4 U	5 U	4 U	6 U	4 U
CHLORODIBROMOMETHANE	1100	3 U	4 U	5 U	4 U	6 U	4 U
CHLOROETHANE	3000	3 U	4 U	5 U	4 U	6 U	4 U
CHLOROFORM	360	3 U	4 U	5 U	4 U	6 U	4 U
CHLOROMETHANE	1200	3 U	4 U	5 U	4 U	6 U	4 U
CIS-1,2-DICHLOROETHENE	4300	3 U	4 U	5 U	4 U	6 U	4 U
CIS-1,3-DICHLOROPROPENE		3 U	4 U	5 U	4 U	6 U	4 U
CYCLOHEXANE	14000	3 U	4 U	5 U	4 U	6 U	4 U
DICHLORODIFLUOROMETHANE	9400	3 U	4 U	5 U	4 U	6 U	4 U
ETHYLBENZENE	8900	3 U	4 U	5 U	4 U	6 U	4 U
ISOPROPYLBENZENE	57000	3 U	4 U	5 U	4 U	6 U	4 U
METHYL ACETATE	2200000	3 U	4 U	5 U	4 U	6 U	4 UJ
METHYL CYCLOHEXANE	260000	3 U	4 U	5 U	4 U	6 U	4 U
METHYL TERT-BUTYL ETHER	62000	3 U	4 U	5 U	4 U	6 U	4 U
METHYLENE CHLORIDE	9100	6	6	10	6	14	8
O-XYLENE		3 U	4 U	5 U	4 U	6 U	4 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB03	SWOS-S-SB04	SWOS-S-SB04	SWOS-S-SB05	SWOS-S-SB05	SWOS-S-SB06
	SAMPLE NUMBER	SWOS-S-SB03-0305	SWOS-S-SB04-0103	SWOS-S-SB04-0507	SWOS-S-SB05-0103	SWOS-S-SB05-0305	SWOS-S-SB06-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** [(1)]						
P-XYLENE		3 U	4 U	5 U	4 U	6 U	4 U
STYRENE	13000[(2)]	3 U	4 U	5 U	4 U	6 U	4 U
TETRACHLOROETHENE	1500	3 UJ	4 UJ	5 UJ	4 UJ	6 UJ	4 U
TOLUENE	52000	3 U	4 U	5 U	4 U	6 U	4 U
TOTAL XYLENES	27000	3 U	4 U	5 U	4 U	6 U	4 U
TRANS-1,2-DICHLOROETHENE	6900	3 U	4 U	5 U	4 U	6 U	4 U
TRANS-1,3-DICHLOROPROPENE		3 U	4 U	5 U	4 U	6 U	4 U
TRICHLOROETHENE	53	3 U	4 U	5 U	4 U	6 U	4 U
TRICHLOROFLUOROMETHANE	39000	3 U	4 U	5 U	4 U	6 U	4 U
VINYL CHLORIDE	20[(2)]	3 U	4 U	5 U	4 U	6 U	4 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)							
1,1-BIPHENYL		400 U	370 U	400 U	380 U	420 U	340 U
2,2'-OXYBIS(1-CHLOROPROPANE)	2900	400 U	370 U	400 U	380 U	420 U	340 U
2,4,5-TRICHLOROPHENOL	330000[(2)]	820 U	740 U	820 U	760 U	850 U	700 U
2,4,6-TRICHLOROPHENOL	610	400 U	370 U	400 U	380 U	420 U	340 U
2,4-DICHLOROPHENOL	18000	400 U	370 U	400 U	380 U	420 U	340 U
2,4-DIMETHYLPHENOL	120000	400 U	370 U	400 U	380 U	76 J	340 U
2,4-DINITROPHENOL	12000	820 U	740 U	820 U	760 U	850 U	700 U
2,4-DINITROTOLUENE	900[(2)]	400 U	370 U	400 U	380 U	420 U	340 U
2,6-DINITROTOLUENE	6100	400 U	370 U	400 U	380 U	420 U	340 U
2-CHLORONAPHTHALENE	490000	400 U	370 U	400 U	380 U	420 U	340 U
2-CHLOROPHENOL	6300	400 U	370 U	400 U	380 U	420 U	340 U
2-METHYLNAPHTHALENE		400 U	370 U	400 U	380 U	44 J	340 U
2-METHYLPHENOL	310000	400 U	370 U	400 U	380 U	420 U	340 U
2-NITROANILINE	170	820 U	740 U	820 U	760 U	850 U	700 U
2-NITROPHENOL		400 U	370 U	400 U	380 U	420 U	340 U
3,3'-DICHLOROBENZIDINE	1100	400 U	370 U	400 U	380 U	R	340 U
3-NITROANILINE		820 U	740 U	820 U	760 U	850 UJ	700 U
4,6-DINITRO-2-METHYLPHENOL		820 U	740 U	820 U	760 U	850 UJ	700 U
4-BROMOPHENYL PHENYL ETHER		400 U	370 U	400 U	380 U	420 U	340 U
4-CHLORO-3-METHYLPHENOL		400 U	370 U	400 U	380 U	420 U	340 U
4-CHLOROANILINE	24000	400 U	370 U	400 U	380 U	420 UJ	340 U
4-CHLOROPHENYL PHENYL ETHER		400 U	370 U	400 U	380 U	420 U	340 U
4-METHYLPHENOL	31000	400 U	370 U	400 U	380 U	120 J	340 U
4-NITROANILINE		820 U	740 U	820 U	760 U	850 UJ	700 U
4-NITROPHENOL		820 U	740 U	820 U	760 U	850 U	700 U
ACENAPHTHENE	43000[(2)]	410 U	370 U	410 U	380 U	420 U	340 U
ACENAPHTHYLENE	5600	400 U	370 U	400 U	380 U	880	340 U
ACETOPHENONE		400 U	370 U	400 U	380 U	420 U	340 U
ANTHRACENE	35000[(2)]	400 U	370 U	400 U	380 U	500	340 U
ATRAZINE	2200	400 U	370 U	400 U	380 U	420 U	340 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB03	SWOS-S-SB04	SWOS-S-SB04	SWOS-S-SB05	SWOS-S-SB05	SWOS-S-SB06
	SAMPLE NUMBER	SWOS-S-SB03-0305	SWOS-S-SB04-0103	SWOS-S-SB04-0507	SWOS-S-SB05-0103	SWOS-S-SB05-0305	SWOS-S-SB06-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** (1)						
BENZALDEHYDE	610000	400 U	370 U	400 U	380 U	300 J	340 U
BENZO(A)ANTHRACENE	620	120 J	89 J	400 U	79 J	3800 J	78 J
BENZO(A)PYRENE	62	120 J	77 J	400 U	78 J	4500 J	76 J
BENZO(B)FLUORANTHENE	620	150 J	90 J	400 U	110 J	6100 J	98 J
BENZO(G,H,I)PERYLENE	800(2)	85 J	53 J	400 U	49 J	1200 J	340 U
BENZO(K)FLUORANTHENE	900(2)	62 J	58 J	400 U	40 J	2800 J	48 J
BIS(2-CHLOROETHOXY)METHANE		400 U	370 U	400 U	380 U	420 U	340 U
BIS(2-CHLOROETHYL)ETHER	210	400 U	370 U	400 U	380 U	420 U	340 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	400 U	370 U	140 J	380 U	94 J	340 U
BUTYL BENZYL PHTHALATE	1200000	400 U	370 U	400 U	380 U	420 UJ	340 U
CAPROLACTAM	3100000	400 U	370 U	400 U	380 U	420 U	340 U
CARBAZOLE	24000	400 U	370 U	400 U	380 U	99 J	340 U
CHRYSENE	400(2)	100 J	78 J	400 U	84 J	3800 J	78 J
DIBENZO(A,H)ANTHRACENE	62	400 U	370 U	400 U	380 U	400 J	340 U
DIBENZOFURAN	29000	400 U	370 U	400 U	380 U	420 U	340 U
DIETHYL PHTHALATE	340000(2)	400 U	370 U	400 U	380 U	420 U	340 U
DIMETHYL PHTHALATE	1900000(2)	400 U	370 U	400 U	380 U	420 U	340 U
DI-N-BUTYL PHTHALATE	610000	400 U	370 U	400 U	380 U	420 U	340 U
DI-N-OCTYL PHTHALATE	240000	400 U	370 U	400 U	380 U	420 UJ	340 U
FLUORANTHENE	20000(2)	220 J	140 J	400 U	170 J	3700	110 J
FLUORENE	28000(2)	400 U	370 U	400 U	380 U	99 J	340 U
HEXACHLOROBENZENE	300	400 U	370 U	400 U	380 U	420 U	340 U
HEXACHLOROBUTADIENE	6200	400 U	370 U	400 U	380 U	420 U	340 U
HEXACHLOROCYCLOPENTADIENE	37000	400 U	370 U	400 U	380 U	420 U	340 U
HEXACHLOROETHANE	35000	400 U	370 U	400 U	380 U	420 U	340 U
INDENO(1,2,3-CD)PYRENE	620	75 J	40 J	400 U	46 J	1300 J	43 J
ISOPHORONE	510000	400 U	370 U	400 U	380 U	420 U	340 U
NAPHTHALENE	5600	400 U	370 U	400 U	380 U	79 J	340 U
NITROBENZENE	2000	400 U	370 U	400 U	380 U	420 U	340 U
N-NITROSO-DI-N-PROPYLAMINE	69	400 U	370 U	400 U	380 U	420 U	340 U
N-NITROSODIPHENYLAMINE	99000	400 U	370 U	400 U	380 U	420 U	340 U
PENTACHLOROPHENOL	3000	820 U	740 U	820 U	760 U	850 U	700 U
PHENANTHRENE	40000(2)	400 U	67 J	400 U	62 J	570	340 U
PHENOL	3700000	400 U	370 U	400 U	380 U	50 J	340 U
PYRENE	13000(2)	240 J	140 J	41 J	130 J	7800	110 J
TOTAL PAHs		1172	832	41	848	37572	641

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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB03	SWOS-S-SB04	SWOS-S-SB04	SWOS-S-SB05	SWOS-S-SB05	SWOS-S-SB06
	SAMPLE NUMBER	SWOS-S-SB03-0305	SWOS-S-SB04-0103	SWOS-S-SB04-0507	SWOS-S-SB05-0103	SWOS-S-SB05-0305	SWOS-S-SB06-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** [(1)]						
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)							
DIESEL RANGE ORGANICS	500[(2)]	50	20	19	29	1100	13 U
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)							
GASOLINE RANGE ORGANICS		2.3 U	2.6 U	1.7 U	2.1 U	2.3 U	1.6 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)							
4,4'-DDD	2400	4 U	3.7 U	4 U	3.8 U	21 J	3.4 U
4,4'-DDE	1700	4 U	3.7 U	4 U	3.8 U	4.2 U	3.4 UJ
4,4'-DDT	1700	4 U	3.7 U	4 U	3.8 U	R	3.4 UJ
ALDRIN	29	2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 U
ALPHA-BHC	90	2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 U
ALPHA-CHLORDANE		2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 U
BETA-BHC	320	2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 UJ
DELTA-BHC		2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 U
DIELDRIN	30	4 U	3.7 U	4 U	3.8 U	4.2 U	3.4 U
ENDOSULFAN I		2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 U
ENDOSULFAN II		4 U	3.7 U	4 U	3.8 U	4.2 U	3.4 U
ENDOSULFAN SULFATE		4 U	3.7 U	4 U	3.8 U	36 J	3.4 UJ
ENDRIN	1800	4 U	3.7 U	4 U	3.8 U	4.2 U	3.4 UJ
ENDRIN ALDEHYDE		4 U	3.7 U	4 U	3.8 U	4.2 U	3.4 U
ENDRIN KETONE		4 U	3.7 U	4 U	3.8 U	R	3.4 UJ
GAMMA-BHC (LINDANE)	440	2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 U
GAMMA-CHLORDANE		2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 U
HEPTACHLOR	110	2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 U
HEPTACHLOR EPOXIDE	53	2.1 U	1.9 U	2.1 U	1.9 U	2.2 U	1.8 U
METHOXYCHLOR	31000	21 U	19 U	21 U	19 U	78 J	18 U
TOXAPHENE	440	210 U	190 U	210 U	190 U	220 U	180 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)							
AROCLOR-1016	390	40 U	37 U	40 U	38 U	42 U	34 UJ
AROCLOR-1221	220	40 U	37 U	40 U	38 U	42 U	34 UJ
AROCLOR-1232		40 U	37 U	40 U	38 U	42 U	34 UJ
AROCLOR-1242		40 U	37 U	40 U	38 U	42 U	34 UJ
AROCLOR-1248		40 U	37 U	40 U	38 U	42 U	34 UJ
AROCLOR-1254		40 U	37 U	40 U	38 U	42 U	34 UJ
AROCLOR-1260		40 U	37 U	40 U	38 U	42 U	34 UJ

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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB03	SWOS-S-SB04	SWOS-S-SB04	SWOS-S-SB05	SWOS-S-SB05	SWOS-S-SB06
	SAMPLE NUMBER	SWOS-S-SB03-0305	SWOS-S-SB04-0103	SWOS-S-SB04-0507	SWOS-S-SB05-0103	SWOS-S-SB05-0305	SWOS-S-SB06-0103
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL (1)**						
METALS BY METHOD 6010B (MG/KG)							
ALUMINUM	7600	13200	8570	10800	9200	9360	3340
ANTIMONY	3.1	0.056 UJ	0.051 UJ	0.059 UJ	0.052 UJ	0.49 UJ	0.32 UJ
ARSENIC	0.39	4.7 J	4.9 J	3.2 J	6.5 J	5.5 J	3.0 J
BARIUM	540	34.1 J	18.0 J	24.4 J	14.8 J	37.1 J	15.4 J
BERYLLIUM	0.4(2)	0.35 J	0.28 J	0.18 UJ	0.27 J	0.31 J	0.21 J
CADMIUM	3.7	0.0055 UJ	0.0051 UJ	0.0058 UJ	0.0051 UJ	0.72 J	0.023 UJ
CALCIUM		1460	792	1320	979	7300	569
CHROMIUM	30	12.2 J	8.8 J	10.6 J	8.5 J	12.2 J	0.55 J
COBALT	900	6.1 J	7.6 J	4.4 J	8.4 J	8.7 J	1.7 J
COPPER	310	21.0	27.5	14.7	24.0	47.7	8.6
IRON	2300	24800	22500	26100	22800	31200	7490
LEAD	150(2)	42.7 J	17.5 J	12.8 J	21.3 J	596	10.3 J
MAGNESIUM		2350	2040	1850	2040	3640	853
MANGANESE	180	143	346	127	286	341	185
NICKEL	160	11.8 J	11.4 J	9.1 J	13 J	15.0 J	1.1 J
POTASSIUM		461	273	421	337.0	327	742
SELENIUM	39	3.5 J	3.4 J	3.2 J	3.3 J	3.0 J	1.5 J
SILVER	39	0.019 UJ	0.017 UJ	0.020 UJ	0.018 UJ	0.019 UJ	0.017 UJ
SODIUM		64.8	27.5	103	42.8	71.9	30.5
THALLIUM	0.52	3.6 J	2.5 J	2.2 J	2.9 J	2.5 J	2.6 J
VANADIUM	55	20.5 J	12.7 J	19.0 J	13.9 J	17.2 J	4.1 J
ZINC	2300	255	51.4 J	34.2 J	44.2 J	601	45.7
METALS BY METHOD 7471A (MG/KG)							
MERCURY	2.3	0.056	0.15	0.029	0.054	0.14	0.014

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB06	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB08	SWOS-S-SB08
	SAMPLE NUMBER	SWOS-S-SB06-0507	SWOS-S-SB07-0103	SWOS-S-SB07-0103-D	SWOS-S-SB07-0305	SWOS-S-SB08-0103	SWOS-S-SB08-0507
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER		Field Dup.	Field Dup.			
	DUPLICATE			SWOS-S-SB07-0103			
PARAMETER	**PAL [1]**						
VOLATILES BY METHOD 8260B (UG/KG)							
1,1,1-TRICHLOROETHANE	120000	5 U	4 U	5 U	5 U	5 U	6 U
1,1,2,2-TETRACHLOROETHANE	410	5 U	4 U	5 U	5 U	5 U	6 U
1,1,2-TRICHLOROETHANE	730	5 U	4 U	5 U	5 U	5 U	6 U
1,1,2-TRICHLOROTRIFLUOROETHANE	560000	5 U	4 U	5 U	5 U	5 U	6 U
1,1-DICHLOROETHANE	51000	5 U	4 U	5 U	5 U	5 U	6 U
1,1-DICHLOROETHENE	200[2]	5 U	4 U	5 U	5 U	5 U	6 U
1,2,4-TRICHLOROBENZENE	65000	5 U	4 U	5 U	5 U	5 U	6 U
1,2-DIBROMO-3-CHLOROPROPANE	450	5 UJ	4 UJ	5 UJ	5 UJ	5 U	6 U
1,2-DIBROMOETHANE	6.9	5 U	4 U	5 U	5 U	5 U	6 U
1,2-DICHLOROBENZENE	37000	5 U	4 U	5 U	5 U	5 U	6 U
1,2-DICHLOROETHANE	280	5 U	4 U	5 U	5 U	5 U	6 U
1,2-DICHLOROPROPANE	340	5 U	4 U	5 U	5 U	5 U	6 U
1,3-DICHLOROBENZENE	1600	5 U	4 U	5 U	5 U	5 U	6 U
1,4-DICHLOROBENZENE	3400	5 U	4 U	5 U	5 U	5 U	6 U
2-BUTANONE	730000	5 UJ	4 UJ	5 UJ	5 UJ	5 UJ	6 UJ
2-HEXANONE		5 UJ	4 UJ	5 UJ	5 UJ	5 U	6 U
4-METHYL-2-PENTANONE	79000	5 U	4 U	5 U	5 U	5 U	6 U
ACETONE	160000	49 UJ	84 UJ	76 UJ	280 UJ	160 UJ	89 UJ
BENZENE	600	5 U	4 U	5 U	5 U	5 U	6 U
BROMODICHLOROMETHANE	820	5 U	4 U	5 U	5 U	5 U	6 U
BROMOFORM	62000	5 U	4 U	5 U	5 U	5 UJ	6 UJ
BROMOMETHANE	390	5 U	4 U	5 U	5 U	5 U	6 U
CARBON DISULFIDE	36000	2 J	4 U	5 U	5 U	5 U	6 U
CARBON TETRACHLORIDE	250	5 U	4 U	5 U	5 U	5 U	6 U
CHLOROBENZENE	15000	5 U	4 U	5 U	5 U	5 U	6 U
CHLORODIBROMOMETHANE	1100	5 U	4 U	5 U	5 U	5 U	6 U
CHLOROETHANE	3000	5 U	4 U	5 U	5 U	5 U	6 U
CHLOROFORM	360	5 U	4 U	5 U	5 U	5 U	6 U
CHLOROMETHANE	1200	5 U	4 U	5 U	5 U	5 U	6 U
CIS-1,2-DICHLOROETHENE	4300	5 U	4 U	5 U	5 U	5 U	6 U
CIS-1,3-DICHLOROPROPENE		5 U	4 U	5 U	5 U	5 U	6 U
CYCLOHEXANE	14000	5 U	4 U	5 U	5 U	5 U	6 U
DICHLORODIFLUOROMETHANE	9400	5 U	4 U	5 U	5 U	5 U	6 U
ETHYLBENZENE	8900	5 U	4 U	5 U	5 U	5 U	6 U
ISOPROPYLBENZENE	57000	5 U	4 U	5 U	5 U	5 U	3 J
METHYL ACETATE	2200000	5 UJ	4 UJ	5 UJ	5 UJ	5 U	6 U
METHYL CYCLOHEXANE	260000	5 U	4 U	5 U	5 U	5 U	18
METHYL TERT-BUTYL ETHER	62000	5 U	4 U	5 U	5 U	5 U	6 U
METHYLENE CHLORIDE	9100	11	7 J	13 J	7	5	6 U
O-XYLENE		5 U	4 U	5 U	5 U	5 U	6 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB06	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB08	SWOS-S-SB08
	SAMPLE NUMBER	SWOS-S-SB06-0507	SWOS-S-SB07-0103	SWOS-S-SB07-0103-D	SWOS-S-SB07-0305	SWOS-S-SB08-0103	SWOS-S-SB08-0507
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER		Field Dup.	Field Dup.			
	DUPLICATE			SWOS-S-SB07-0103			
PARAMETER	**PAL (1)**						
P-XYLENE		5 U	4 U	5 U	5 U	5 U	6 U
STYRENE	13000(2)	5 U	4 U	5 U	5 U	5 U	6 U
TETRACHLOROETHENE	1500	5 U	4 U	5 U	5 U	5 UJ	6 UJ
TOLUENE	52000	5 U	4 U	5 U	5 U	5 U	6 U
TOTAL XYLENES	27000	5 U	4 U	5 U	5 U	5 U	6 U
TRANS-1,2-DICHLOROETHENE	6900	5 U	4 U	5 U	5 U	5 U	6 U
TRANS-1,3-DICHLOROPROPENE		5 U	4 U	5 U	5 U	5 U	6 U
TRICHLOROETHENE	53	5 U	4 U	5 U	5 U	5 U	6 U
TRICHLOROFLUOROMETHANE	39000	5 U	4 U	5 U	5 U	5 U	6 U
VINYL CHLORIDE	20(2)	5 U	4 U	5 U	5 U	5 U	6 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)							
1,1-BIPHENYL		400 U	360 U	360 U	500 U	380 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	2900	400 U	360 U	360 U	500 U	380 U	360 U
2,4,5-TRICHLOROPHENOL	330000(2)	810 U	740 U	740 U	1000 U	760 U	730 U
2,4,6-TRICHLOROPHENOL	610	400 U	360 U	360 U	500 U	380 U	360 U
2,4-DICHLOROPHENOL	18000	400 U	360 U	360 U	500 U	380 U	360 U
2,4-DIMETHYLPHENOL	120000	400 U	360 U	360 U	500 U	380 U	360 U
2,4-DINITROPHENOL	12000	810 U	740 U	740 U	1000 U	760 U	730 U
2,4-DINITROTOLUENE	900(2)	400 U	360 U	360 U	500 U	380 U	360 U
2,6-DINITROTOLUENE	6100	400 U	360 U	360 U	500 U	380 U	360 U
2-CHLORONAPHTHALENE	490000	400 U	360 U	360 U	500 U	380 U	360 U
2-CHLOROPHENOL	6300	400 U	360 U	360 U	500 U	380 U	360 U
2-METHYLNAPHTHALENE		400 U	360 U	360 U	290 J	380 U	24000
2-METHYLPHENOL	310000	400 U	360 U	360 U	500 U	380 U	360 U
2-NITROANILINE	170	810 U	740 U	740 U	1000 U	760 U	730 U
2-NITROPHENOL		400 U	360 U	360 U	500 U	380 U	360 U
3,3'-DICHLOROBENZIDINE	1100	400 U	360 UJ	360 UJ	500 U	380 U	360 U
3-NITROANILINE		810 U	740 U	740 U	1000 U	760 U	730 U
4,6-DINITRO-2-METHYLPHENOL		810 U	740 U	740 U	1000 U	760 U	730 U
4-BROMOPHENYL PHENYL ETHER		400 U	360 U	360 U	500 U	380 U	360 U
4-CHLORO-3-METHYLPHENOL		400 U	360 U	360 U	500 U	380 U	360 U
4-CHLOROANILINE	24000	400 U	360 U	360 U	500 U	380 U	360 U
4-CHLOROPHENYL PHENYL ETHER		400 U	360 U	360 U	500 U	380 U	360 U
4-METHYLPHENOL	31000	400 U	360 U	360 U	500 U	380 U	360 U
4-NITROANILINE		810 U	740 U	740 U	1000 U	760 U	730 U
4-NITROPHENOL		810 U	740 U	740 U	1000 U	760 U	730 U
ACENAPHTHENE	43000(2)	400 U	360 U	360 U	500 U	380 U	360 U
ACENAPHTHYLENE	5600	400 U	110 J	74 J	81 J	56 J	360 U
ACETOPHENONE		400 U	360 U	360 U	500 U	380 U	360 U
ANTHRACENE	35000(2)	70 J	360 U	360 U	100 J	120 J	1600
ATRAZINE	2200	400 U	360 U	360 U	500 U	380 U	360 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB06	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB08	SWOS-S-SB08
	SAMPLE NUMBER	SWOS-S-SB06-0507	SWOS-S-SB07-0103	SWOS-S-SB07-0103-D	SWOS-S-SB07-0305	SWOS-S-SB08-0103	SWOS-S-SB08-0507
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER		Field Dup.	Field Dup.			
	DUPLICATE			SWOS-S-SB07-0103			
PARAMETER	**PAL (1)**						
BENZALDEHYDE	610000	400 U	360 U	360 U	500 U	380 U	360 U
BENZO(A)ANTHRACENE	620	180 J	110 J	83 J	520	610	92 J
BENZO(A)PYRENE	62	170 J	150 J	120 J	660	580	52 J
BENZO(B)FLUORANTHENE	620	220 J	240 J	200 J	810	920	89 J
BENZO(G,H,I)PERYLENE	800(2)	90 J	360 UJ	360 UJ	480 J	200 J	360 U
BENZO(K)FLUORANTHENE	900(2)	110 J	130 J	120 J	320 J	400	360 U
BIS(2-CHLOROETHOXY)METHANE		400 U	360 U	360 U	500 U	380 U	360 U
BIS(2-CHLOROETHYL)ETHER	210	400 U	360 U	360 U	500 U	380 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	53 J	120 J	130 J	56 J	48 J	39 J
BUTYL BENZYL PHTHALATE	1200000	400 U	360 UJ	360 U	500 U	380 U	360 U
CAPROLACTAM	3100000	400 U	360 U	360 U	500 U	380 U	360 U
CARBAZOLE	24000	400 U	360 U	360 U	500 U	380 U	360 U
CHRYSENE	400(2)	190 J	140 J	120 J	520	630	120 J
DIBENZO(A,H)ANTHRACENE	62	400 U	360 UJ	360 UJ	120 J	72 J	360 U
DIBENZOFURAN	29000	400 U	360 U	360 U	500 U	43 J	1100
DIETHYL PHTHALATE	340000(2)	400 U	360 U	360 U	500 U	380 U	360 U
DIMETHYL PHTHALATE	1900000(2)	400 U	360 U	360 U	500 U	380 U	360 U
DI-N-BUTYL PHTHALATE	610000	400 U	360 U	360 U	500 U	380 U	360 U
DI-N-OCTYL PHTHALATE	240000	400 U	360 UJ	360 UJ	500 U	380 U	360 U
FLUORANTHENE	20000(2)	390 J	160 J	120 J	680	1100	370
FLUORENE	28000(2)	400 U	41 J	360 U	500 U	380 U	360 U
HEXACHLOROBENZENE	300	400 U	360 U	360 U	500 U	380 U	360 U
HEXACHLOROBUTADIENE	6200	400 U	360 U	360 U	500 U	380 U	360 U
HEXACHLOROCYCLOPENTADIENE	37000	400 U	360 U	360 U	500 U	380 U	360 U
HEXACHLOROETHANE	35000	400 U	360 U	360 U	500 U	380 U	360 U
INDENO(1,2,3-CD)PYRENE	620	89 J	360 UJ	360 UJ	420 J	220 J	360 U
ISOPHORONE	510000	400 U	360 U	360 U	500 U	380 U	360 U
NAPHTHALENE	5600	400 U	360 U	360 U	140 J	45 J	4000
NITROBENZENE	2000	400 U	360 U	360 U	500 U	380 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	69	400 U	360 U	360 U	500 U	380 U	360 U
N-NITROSODIPHENYLAMINE	99000	400 U	360 U	360 U	500 U	380 U	360 U
PENTACHLOROPHENOL	3000	810 U	740 U	740 U	1000 U	760 U	730 U
PHENANTHRENE	40000(2)	180 J	140 J	80 J	120 J	500	3500
PHENOL	3700000	400 U	360 U	360 U	500 U	380 U	360 U
PYRENE	13000(2)	280 J	390	310 J	520	1100	420
TOTAL PAHs		1969	1611	1227	5781	6553	34243

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB06	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB08	SWOS-S-SB08
	SAMPLE NUMBER	SWOS-S-SB06-0507	SWOS-S-SB07-0103	SWOS-S-SB07-0103-D	SWOS-S-SB07-0305	SWOS-S-SB08-0103	SWOS-S-SB08-0507
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER		Field Dup.	Field Dup.			
	DUPLICATE			SWOS-S-SB07-0103			
PARAMETER	**PAL** [1]						
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)							
DIESEL RANGE ORGANICS	500[2]	400	320	480	1400	48	7200
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)							
GASOLINE RANGE ORGANICS		3.9 U	2.0 U	1.7 U	15	2.5 U	160
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)							
4,4'-DDD	2400	4 U	3.6 U	3.6 U	5 U	3.7 U	3.6 U
4,4'-DDE	1700	4 UJ	3.6 UJ	3.6 UJ	5 UJ	3.7 U	3.6 UJ
4,4'-DDT	1700	4 UJ	3.6 UJ	3.6 UJ	5 UJ	3.7 U	3.6 UJ
ALDRIN	29	2 U	1.9 U	1.9 U	2.6 U	1.9 U	1.9 U
ALPHA-BHC	90	2 U	1.9 U	1.9 U	2.6 U	1.9 U	1.9 U
ALPHA-CHLORDANE		2 U	1.9 U	1.9 U	2.6 U	1.9 U	1.9 U
BETA-BHC	320	2 UJ	1.9 UJ	1.9 UJ	2.6 UJ	1.9 U	1.9 UJ
DELTA-BHC		2 U	1.9 U	1.9 U	2.6 U	1.9 U	1.9 U
DIELDRIN	30	4 U	3.6 U	3.6 U	5 U	3.7 U	3.6 U
ENDOSULFAN I		2 U	1.9 U	1.9 U	2.6 U	1.9 U	1.9 U
ENDOSULFAN II		4 U	3.6 U	3.6 U	5 U	3.7 U	3.6 U
ENDOSULFAN SULFATE		4 UJ	3.6 UJ	3.6 UJ	5 UJ	8.8 J	3.6 UJ
ENDRIN	1800	4 UJ	3.6 UJ	3.6 UJ	5 UJ	3.7 U	3.6 UJ
ENDRIN ALDEHYDE		4 U	3.6 U	3.6 U	5 U	3.7 U	3.6 U
ENDRIN KETONE		4 UJ	3.6 UJ	3.6 UJ	5 UJ	3.7 U	3.6 UJ
GAMMA-BHC (LINDANE)	440	2 U	1.9 U	1.9 U	2.6 U	1.9 U	1.9 U
GAMMA-CHLORDANE		2 U	1.9 U	1.9 U	2.6 U	1.9 UJ	1.9 U
HEPTACHLOR	110	2 U	1.9 U	1.9 U	2.6 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	53	2 U	1.9 U	1.9 U	2.6 U	1.9 U	1.9 U
METHOXYCHLOR	31000	20 U	19 U	19 U	26 U	19 U	19 U
TOXAPHENE	440	200 U	190 U	190 U	260 U	190 U	190 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)							
AROCLOR-1016	390	40 UJ	36 UJ	36 UJ	50 UJ	37 U	36 UJ
AROCLOR-1221	220	40 UJ	36 UJ	36 UJ	50 UJ	37 U	36 UJ
AROCLOR-1232		40 UJ	36 UJ	36 UJ	50 UJ	37 U	36 UJ
AROCLOR-1242		40 UJ	36 UJ	36 UJ	50 UJ	37 U	36 UJ
AROCLOR-1248		40 UJ	36 UJ	36 UJ	50 UJ	37 U	36 UJ
AROCLOR-1254		40 UJ	36 UJ	36 UJ	50 UJ	37 U	36 UJ
AROCLOR-1260		40 UJ	36 UJ	36 UJ	50 UJ	37 U	36 UJ

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB06	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB07	SWOS-S-SB08	SWOS-S-SB08
	SAMPLE NUMBER	SWOS-S-SB06-0507	SWOS-S-SB07-0103	SWOS-S-SB07-0103-D	SWOS-S-SB07-0305	SWOS-S-SB08-0103	SWOS-S-SB08-0507
	SAMPLE DATE	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05	03/15/05
	QC IDENTIFIER		Field Dup.	Field Dup.			
	DUPLICATE			SWOS-S-SB07-0103			
PARAMETER	**PAL (1)**						
METALS BY METHOD 6010B (MG/KG)							
ALUMINUM	7600	10500	12400	11000	13000	13600	9620
ANTIMONY	3.1	0.34 UJ	0.51 UJ	0.35 UJ	0.44 UJ	0.12 UJ	0.25 UJ
ARSENIC	0.39	5.4 J	5.3 J	4.2 J	9.7 J	7.8 J	5.8 J
BARIUM	540	17.3 J	20.5 J	17.1 J	146 J	23.4 J	50.6 J
BERYLLIUM	0.4(2)	0.32 J	0.29 J	0.26 J	0.43 J	0.33 J	0.33 J
CADMIUM	3.7	0.014 UJ	0.0050 UJ	0.0049 UJ	1.3 J	0.0053 UJ	0.0049 UJ
CALCIUM		1340	2030	1830	3760	2020	1710
CHROMIUM	30	11.3 J	15.3 J	13.0 J	10.5 J	13.6 J	10.1 J
COBALT	900	9.7 J	16.3 J	12.7 J	8.1 J	12.4 J	8.0 J
COPPER	310	27.6	37.1	32.6	29.6	35.3	64.1
IRON	2300	28800	39900	31400	25000	48100	24200
LEAD	150(2)	33.8 J	33.7 J	30.3 J	1400	46.2 J	54.5 J
MAGNESIUM		2790	3830	3500	2820	3610	2790
MANGANESE	180	286	582	477	389	433	371
NICKEL	160	15.4 J	21.9 J	19.0 J	17.7 J	19.2 J	12.8 J
POTASSIUM		325	476	426	367	312	333
SELENIUM	39	4.2 J	4.7 J	4.1 J	3.9 J	4.5 J	3.8 J
SILVER	39	0.021 UJ	0.017 UJ	0.017 UJ	0.024 UJ	0.018 UJ	0.017 UJ
SODIUM		69.6	48.8	47.4	71.3	50.8	74.1
THALLIUM	0.52	2.5 J	3.0 J	2.7 J	3.7 J	R	2.4 J
VANADIUM	55	17.7 J	21.7 J	20.8 J	19.2 J	22.2 J	15.6 J
ZINC	2300	75.3	65.2 J	59.3 J	622	90.2 J	58.9 J
METALS BY METHOD 7471A (MG/KG)							
MERCURY	2.3	0.055	0.022	0.022	0.052	0.16	0.071

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB09	SWOS-S-SB09	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB11
	SAMPLE NUMBER	SWOS-S-SB09-0103	SWOS-S-SB09-0709	SWOS-S-SB10-0103	SWOS-S-SB10-0103-D	SWOS-S-SB10-0305	SWOS-S-SB11-0103
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB10-0103		
PARAMETER	**PAL [1]**						
VOLATILES BY METHOD 8260B (UG/KG)							
1,1,1-TRICHLOROETHANE	120000	4 U	4 U	5 U	5 U	4 U	4 U
1,1,2,2-TETRACHLOROETHANE	410	4 UJ	4 UJ	5 UJ	5 UJ	4 UJ	4 UJ
1,1,2-TRICHLOROETHANE	730	4 U	4 U	5 U	5 U	4 U	4 U
1,1,2-TRICHLOROTRIFLUOROETHANE	560000	4 U	4 U	5 U	5 U	4 U	4 U
1,1-DICHLOROETHANE	51000	4 U	4 U	5 U	5 U	4 U	4 U
1,1-DICHLOROETHENE	200[2]	4 U	4 U	5 U	5 U	4 U	4 U
1,2,4-TRICHLOROBENZENE	65000	4 UJ	4 UJ	5 UJ	5 UJ	4 UJ	4 UJ
1,2-DIBROMO-3-CHLOROPROPANE	450	4 UJ	4 UJ	5 UJ	5 UJ	4 UJ	4 UJ
1,2-DIBROMOETHANE	6.9	4 U	4 U	5 UJ	5 U	4 U	4 U
1,2-DICHLOROBENZENE	37000	4 UJ	4 UJ	5 UJ	5 UJ	4 UJ	4 UJ
1,2-DICHLOROETHANE	280	4 U	4 U	5 U	5 U	4 U	4 U
1,2-DICHLOROPROPANE	340	4 U	4 U	5 U	5 U	4 U	4 U
1,3-DICHLOROBENZENE	1600	4 UJ	4 UJ	5 UJ	5 UJ	4 UJ	4 UJ
1,4-DICHLOROBENZENE	3400	4 UJ	4 UJ	5 UJ	5 UJ	4 UJ	4 UJ
2-BUTANONE	730000	4 U	4 U	5 U	5 UJ	4 U	4 UJ
2-HEXANONE		4 UJ	4 UJ	5 UJ	5 U	4 UJ	4 UJ
4-METHYL-2-PENTANONE	79000	4 U	4 U	5 U	5 U	4 U	4 UJ
ACETONE	160000	18 U	82 U	450 UJ	140 UJ	65 U	130 UJ
BENZENE	600	4 U	4 U	5 U	5 U	4 U	4 U
BROMODICHLOROMETHANE	820	4 U	4 U	5 U	5 U	4 U	4 U
BROMOFORM	62000	4 U	4 U	5 UJ	5 U	4 U	4 U
BROMOMETHANE	390	4 U	4 U	5 U	5 U	4 U	4 U
CARBON DISULFIDE	36000	4 U	4 U	5 U	5 U	4 U	4 U
CARBON TETRACHLORIDE	250	4 U	4 U	5 U	5 U	4 U	4 U
CHLOROBENZENE	15000	4 U	4 U	5 UJ	5 U	4 U	4 U
CHLORODIBROMOMETHANE	1100	4 U	4 U	5 U	5 U	4 U	4 U
CHLOROETHANE	3000	4 U	4 U	5 U	5 U	4 U	4 U
CHLOROFORM	360	4 U	4 U	5 U	5 U	4 U	4 U
CHLOROMETHANE	1200	4 U	4 U	5 U	5 U	4 U	4 U
CIS-1,2-DICHLOROETHENE	4300	4 U	4 U	5 U	5 U	4 U	4 U
CIS-1,3-DICHLOROPROPENE		4 U	4 U	5 U	5 U	4 U	4 U
CYCLOHEXANE	14000	4 U	4 U	5 U	5 U	4 U	4 U
DICHLORODIFLUOROMETHANE	9400	4 U	4 U	5 U	5 U	4 U	4 U
ETHYLBENZENE	8900	4 U	4 U	5 UJ	5 U	4 U	4 U
ISOPROPYLBENZENE	57000	4 U	4 U	5 UJ	5 U	4 U	4 U
METHYL ACETATE	2200000	4 U	4 U	5 U	5 U	4 U	4 U
METHYL CYCLOHEXANE	260000	4 U	4 U	5 U	5 U	4 U	4 U
METHYL TERT-BUTYL ETHER	62000	4 U	4 U	5 U	5 U	4 U	4 U
METHYLENE CHLORIDE	9100	9 U	12 U	12 U	9 U	13 U	10 U
O-XYLENE		4 U	4 U	5 UJ	5 U	4 U	4 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB09	SWOS-S-SB09	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB11
	SAMPLE NUMBER	SWOS-S-SB09-0103	SWOS-S-SB09-0709	SWOS-S-SB10-0103	SWOS-S-SB10-0103-D	SWOS-S-SB10-0305	SWOS-S-SB11-0103
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB10-0103		
PARAMETER	**PAL (1)**						
P-XYLENE		4 U	4 U	5 UJ	5 U	4 U	4 U
STYRENE	13000(2)	4 U	4 U	5 UJ	5 U	4 U	4 U
TETRACHLOROETHENE	1500	4 U	4 U	5 UJ	5 U	4 U	4 U
TOLUENE	52000	4 U	4 U	5 U	5 U	4 U	4 U
TOTAL XYLENES	27000	4 U	4 U	5 UJ	5 U	4 U	4 U
TRANS-1,2-DICHLOROETHENE	6900	4 U	4 U	5 U	5 U	4 U	4 U
TRANS-1,3-DICHLOROPROPENE		4 U	4 U	5 U	5 U	4 U	4 UJ
TRICHLOROETHENE	53	4 U	4 U	5 U	5 U	4 U	4 U
TRICHLOROFLUOROMETHANE	39000	4 U	4 U	5 U	5 U	4 U	4 U
VINYL CHLORIDE	20(2)	4 U	4 U	5 U	5 U	4 U	4 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)							
1,1-BIPHENYL		370 U	370 U	370 U	380 U	350 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	2900	370 U	370 U	370 U	380 U	350 U	360 U
2,4,5-TRICHLOROPHENOL	330000(2)	750 U	750 U	750 U	760 U	720 U	740 U
2,4,6-TRICHLOROPHENOL	610	370 U	370 U	370 U	380 U	350 U	360 U
2,4-DICHLOROPHENOL	18000	370 U	370 U	370 U	380 U	350 U	360 U
2,4-DIMETHYLPHENOL	120000	370 U	370 U	370 U	380 U	350 U	360 U
2,4-DINITROPHENOL	12000	750 U	750 U	750 U	760 U	720 U	740 UJ
2,4-DINITROTOLUENE	900(2)	370 U	370 U	370 U	380 U	350 U	360 U
2,6-DINITROTOLUENE	6100	370 U	370 U	370 U	380 U	350 U	360 U
2-CHLORONAPHTHALENE	490000	370 U	370 U	370 U	380 U	350 U	360 U
2-CHLOROPHENOL	6300	370 U	370 U	370 U	380 U	350 U	360 U
2-METHYLNAPHTHALENE		370 U	370 U	370 U	380 U	350 U	360 U
2-METHYLPHENOL	310000	370 U	370 U	370 U	380 U	350 U	360 U
2-NITROANILINE	170	750 U	750 U	750 U	760 U	720 U	740 U
2-NITROPHENOL		370 U	370 U	370 U	380 U	350 U	360 U
3,3'-DICHLOROBENZIDINE	1100	370 U	370 U	370 U	380 U	350 U	360 U
3-NITROANILINE		750 U	750 U	750 U	760 U	720 U	740 U
4,6-DINITRO-2-METHYLPHENOL		750 U	750 U	750 U	760 U	720 U	740 UJ
4-BROMOPHENYL PHENYL ETHER		370 U	370 U	370 U	380 U	350 U	360 U
4-CHLORO-3-METHYLPHENOL		370 U	370 U	370 U	380 U	350 U	360 U
4-CHLOROANILINE	24000	370 U	370 U	370 U	380 U	350 U	360 U
4-CHLOROPHENYL PHENYL ETHER		370 U	370 U	370 U	380 U	350 U	360 U
4-METHYLPHENOL	31000	370 U	370 U	370 U	380 U	350 U	360 U
4-NITROANILINE		750 U	750 U	750 U	760 U	720 U	740 U
4-NITROPHENOL		750 U	750 U	750 U	760 U	720 U	740 U
ACENAPHTHENE	43000(2)	370 U	370 U	370 U	380 U	360 U	370 U
ACENAPHTHYLENE	5600	370 U	370 U	370 U	380 U	350 U	360 U
ACETOPHENONE		370 U	370 U	370 U	380 U	350 U	360 U
ANTHRACENE	35000(2)	370 U	370 U	92 J	79 J	350 U	42 J
ATRAZINE	2200	370 U	370 U	370 U	380 U	350 U	360 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB09	SWOS-S-SB09	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB11
	SAMPLE NUMBER	SWOS-S-SB09-0103	SWOS-S-SB09-0709	SWOS-S-SB10-0103	SWOS-S-SB10-0103-D	SWOS-S-SB10-0305	SWOS-S-SB11-0103
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB10-0103		
PARAMETER	**PAL (1)**						
BENZALDEHYDE	610000	370 U	370 U	370 U	380 U	350 U	360 U
BENZO(A)ANTHRACENE	620	43 J	370 U	320 J	300 J	97 J	240 J
BENZO(A)PYRENE	62	39 J	370 U	290 J	290 J	90 J	230 J
BENZO(B)FLUORANTHENE	620	53 J	370 U	460	400	120 J	350 J
BENZO(G,H,I)PERYLENE	800(2)	370 U	370 U	87 J	130 J	39 J	80 J
BENZO(K)FLUORANTHENE	900(2)	370 U	370 U	200 J	180 J	56 J	140 J
BIS(2-CHLOROETHOXY)METHANE		370 U	370 U	370 U	380 U	350 U	360 U
BIS(2-CHLOROETHYL)ETHER	210	370 U	370 U	370 U	380 U	350 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	58 J	59 J	70 J	44 J	47 J	53 J
BUTYL BENZYL PHTHALATE	1200000	370 U	370 U	370 U	380 U	350 U	360 U
CAPROLACTAM	3100000	370 U	370 U	370 U	380 U	350 U	360 U
CARBAZOLE	24000	370 U	370 U	48 J	48 J	350 U	360 U
CHRYSENE	400(2)	370 U	370 U	320 J	310 J	94 J	220 J
DIBENZO(A,H)ANTHRACENE	62	370 U	370 U	370 U	380 U	350 U	360 UJ
DIBENZOFURAN	29000	370 U	370 U	370 U	380 U	350 U	360 U
DIETHYL PHTHALATE	340000(2)	370 U	370 U	370 U	380 U	350 U	360 U
DIMETHYL PHTHALATE	1900000(2)	370 U	370 U	370 U	380 U	350 U	360 U
DI-N-BUTYL PHTHALATE	610000	370 U	370 U	370 U	380 U	350 U	360 U
DI-N-OCTYL PHTHALATE	240000	370 U	370 U	370 U	380 U	350 U	360 U
FLUORANTHENE	20000(2)	81 J	370 U	700	680	210 J	400
FLUORENE	28000(2)	370 U	370 U	51 J	52 J	350 U	360 U
HEXACHLOROBENZENE	300	370 U	370 U	370 U	380 U	350 U	360 U
HEXACHLOROBUTADIENE	6200	370 U	370 U	370 U	380 U	350 U	360 U
HEXACHLOROCYCLOPENTADIENE	37000	370 U	370 U	370 U	380 U	350 U	360 U
HEXACHLOROETHANE	35000	370 U	370 U	370 U	380 U	350 U	360 U
INDENO(1,2,3-CD)PYRENE	620	370 U	370 U	99 J	120 J	40 J	79 J
ISOPHORONE	510000	370 U	370 U	370 U	380 U	350 U	360 U
NAPHTHALENE	5600	370 U	370 U	370 U	380 U	350 U	360 U
NITROBENZENE	2000	370 U	370 U	370 U	380 U	350 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	69	370 U	370 U	370 U	380 U	350 U	360 U
N-NITROSODIPHENYLAMINE	99000	370 U	370 U	370 U	380 U	350 U	360 U
PENTACHLOROPHENOL	3000	750 U	750 U	750 U	760 U	720 U	740 U
PHENANTHRENE	40000(2)	370 U	370 U	390	480	120 J	170 J
PHENOL	3700000	370 U	370 U	370 U	380 U	350 U	360 U
PYRENE	13000(2)	76 J	370 U	610	620	170 J	470 J
TOTAL PAHs		292		3619	3641	1036	2421

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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB09	SWOS-S-SB09	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB11
	SAMPLE NUMBER	SWOS-S-SB09-0103	SWOS-S-SB09-0709	SWOS-S-SB10-0103	SWOS-S-SB10-0103-D	SWOS-S-SB10-0305	SWOS-S-SB11-0103
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB10-0103		
PARAMETER	**PAL (1)**						
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)							
DIESEL RANGE ORGANICS	500(2)	20	15	35	44	140	45
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)							
GASOLINE RANGE ORGANICS		1.9 U	1.5 U	1.9 U	2.1 U	2.1 U	1.6 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)							
4,4'-DDD	2400	3.7 U	3.7 U	8.2	6.4	3.5 U	3.6 U
4,4'-DDE	1700	11	3.7 U	7.6	6.4	4.2 J	6
4,4'-DDT	1700	15	3.7 U	4.6	3.6 J	3.5 U	11 J
ALDRIN	29	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U
ALPHA-BHC	90	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U
ALPHA-CHLORDANE		1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U
BETA-BHC	320	1.9 U	1.9 U	1.9 U	4.2 J	1.8 U	1.9 U
DELTA-BHC		1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U
DIELDRIN	30	3.7 U	3.7 U	3.7 U	3.8 U	3.5 U	3.6 U
ENDOSULFAN I		1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U
ENDOSULFAN II		3.7 U	3.7 U	3.7 U	3.8 U	3.5 U	3.6 U
ENDOSULFAN SULFATE		3.7 U	3.7 U	3.7 U	3.8 U	3.5 U	3.6 U
ENDRIN	1800	3.7 U	3.7 U	3.7 U	3.8 U	3.5 U	3.6 U
ENDRIN ALDEHYDE		3.7 U	3.7 U	3.7 U	3.8 U	3.5 U	3.6 U
ENDRIN KETONE		3.7 U	3.7 U	3.7 U	3.8 U	3.5 U	3.6 U
GAMMA-BHC (LINDANE)	440	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U
GAMMA-CHLORDANE		1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U
HEPTACHLOR	110	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U
HEPTACHLOR EPOXIDE	53	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U
METHOXYCHLOR	31000	19 U	19 U	19 U	19 U	18 U	19 U
TOXAPHENE	440	190 U	190 U	190 U	190 U	180 U	190 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)							
AROCLOR-1016	390	37 U	37 U	37 U	38 U	35 U	36 U
AROCLOR-1221	220	37 U	37 U	37 U	38 U	35 U	36 U
AROCLOR-1232		37 U	37 U	37 U	38 U	35 U	36 U
AROCLOR-1242		37 U	37 U	37 U	38 U	35 U	36 U
AROCLOR-1248		37 U	37 U	37 U	38 U	35 U	36 U
AROCLOR-1254		37 U	37 U	37 U	38 U	35 U	36 U
AROCLOR-1260		37 U	37 U	37 U	38 U	35 U	36 U

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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB09	SWOS-S-SB09	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB10	SWOS-S-SB11
	SAMPLE NUMBER	SWOS-S-SB09-0103	SWOS-S-SB09-0709	SWOS-S-SB10-0103	SWOS-S-SB10-0103-D	SWOS-S-SB10-0305	SWOS-S-SB11-0103
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB10-0103		
PARAMETER	**PAL (1)**						
METALS BY METHOD 6010B (MG/KG)							
ALUMINUM	7600	8950 J	8200 J	9530 J	9930 J	8470 J	10900 J
ANTIMONY	3.1	0.40 UJ	0.33 UJ	0.37 UJ	0.27 UJ	0.11 UJ	0.053 UJ
ARSENIC	0.39	6.6 J	5.8 J	5.3 J	5.6 J	6.1 J	4.6 J
BARIUM	540	21.1 J	22.6 J	22.8 J	24.2 J	18.3 J	16.3 J
BERYLLIUM	0.4(2)	0.32 J	0.34 J	0.28 J	0.29 J	0.25 J	0.30 J
CADMIUM	3.7	0.0056 UJ	0.0055 UJ	0.0054 UJ	0.0054 UJ	0.0052 UJ	0.0052 UJ
CALCIUM		1600	748	1780	1630	1080	1240
CHROMIUM	30	9.8 J	22.8	8.9 J	10.3 J	9.6 J	11.0 J
COBALT	900	9.7 J	13.0 J	7.0 J	7.1 J	9.4 J	10.7 J
COPPER	310	32.1 J	30.0 J	26.0 J	26.5 J	24.2 J	27.7 J
IRON	2300	28600	25900	26600	25300	27600	31900
LEAD	150(2)	112 J	8.3 J	42.6 J	45.7 J	17.5 J	34.1 J
MAGNESIUM		2720 J	2520 J	2560 J	2400 J	2350 J	3010 J
MANGANESE	180	332 J	331 J	295 J	285 J	321 J	466 J
NICKEL	160	15.1 J	16.0 J	11.9 J	14.6 J	13.6 J	13.8 J
POTASSIUM		444	474	344	338	448	508
SELENIUM	39	4.1 J	3.6 J	3.6 J	2.7 J	3.7 J	4.1 J
SILVER	39	0.019 UJ	0.019 UJ	0.019 UJ	0.019 UJ	0.018 UJ	0.018 UJ
SODIUM		36.1	30.3	37.6	43.4	24.6	33.4
THALLIUM	0.52	3.1 J	2.5 J	2.6 J	2.9 J	2.5 J	2.9 J
VANADIUM	55	15.8 J	14.7 J	15.6 J	16.2 J	15.8 J	14.6 J
ZINC	2300	47.9	44.1	58.6	59.9	44.1	52.0
METALS BY METHOD 7471A (MG/KG)							
MERCURY	2.3	0.013 J	0.0073 U	0.082	0.074	0.074	0.017

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB11	SWOS-S-SB12	SWOS-S-SB12	SWOS-S-SB13	SWOS-S-SB13	SWOS-S-SB14
	SAMPLE NUMBER	SWOS-S-SB11-0305	SWOS-S-SB12-0103	SWOS-S-SB12-0507	SWOS-S-SB13-0103	SWOS-S-SB13-0507	SWOS-S-SB14-0001
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL (1)**						
VOLATILES BY METHOD 8260B (UG/KG)							
1,1,1-TRICHLOROETHANE	120000	6 U	4 U	4 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	410	6 UJ	4 UJ	4 UJ	5 U	5 UJ	5 UJ
1,1,2-TRICHLOROETHANE	730	6 U	4 U	4 U	5 U	5 U	5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	560000	6 U	4 U	4 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	51000	6 U	4 U	4 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	200(2)	6 U	4 U	4 U	5 U	5 U	5 U
1,2,4-TRICHLOROBENZENE	65000	6 UJ	4 UJ	4 UJ	5 U	5 UJ	5 UJ
1,2-DIBROMO-3-CHLOROPROPANE	450	6 UJ	4 UJ	4 UJ	5 U	5 UJ	5 UJ
1,2-DIBROMOETHANE	6.9	6 U	4 U	4 U	5 U	5 U	5 U
1,2-DICHLOROBENZENE	37000	6 UJ	4 UJ	4 UJ	5 U	5 UJ	5 UJ
1,2-DICHLOROETHANE	280	6 U	4 U	4 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	340	6 U	4 U	4 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	1600	6 UJ	4 UJ	4 UJ	5 U	5 UJ	5 UJ
1,4-DICHLOROBENZENE	3400	6 UJ	4 UJ	4 UJ	5 U	5 UJ	5 UJ
2-BUTANONE	730000	6 U	4 U	4 U	5 U	5 U	5 UJ
2-HEXANONE		6 UJ	4 UJ	4 UJ	5 UJ	5 UJ	5 U
4-METHYL-2-PENTANONE	79000	6 U	4 U	4 U	5 U	5 U	5 U
ACETONE	160000	210 U	170 UJ	88 U	240 UJ	63 U	50 UJ
BENZENE	600	6 U	4 U	5 J	5 U	1 J	5 U
BROMODICHLOROMETHANE	820	6 U	4 U	4 U	5 U	5 U	5 U
BROMOFORM	62000	6 U	4 U	4 U	5 U	5 U	5 U
BROMOMETHANE	390	6 U	4 U	4 U	5 U	5 U	5 U
CARBON DISULFIDE	36000	6 U	4 U	4 U	5 U	5 U	5 U
CARBON TETRACHLORIDE	250	6 U	4 U	4 U	5 U	5 U	5 U
CHLOROBENZENE	15000	6 U	4 U	4 U	5 U	5 U	5 U
CHLORODIBROMOMETHANE	1100	6 U	4 U	4 U	5 U	5 U	5 U
CHLOROETHANE	3000	6 U	4 U	4 U	5 U	5 U	5 U
CHLOROFORM	360	5 J	4 U	4 U	5 U	5 U	5 U
CHLOROMETHANE	1200	6 U	4 U	4 U	5 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	4300	6 U	4 U	4 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE		6 U	4 U	4 U	5 U	5 U	5 U
CYCLOHEXANE	14000	6 U	4 U	4 U	5 U	5 U	5 U
DICHLORODIFLUOROMETHANE	9400	6 U	4 U	4 U	5 U	5 U	5 U
ETHYLBENZENE	8900	6 U	4 U	4 U	5 U	5 U	5 U
ISOPROPYLBENZENE	57000	6 U	4 U	270 J	5 U	210 J	5 U
METHYL ACETATE	2200000	6 U	4 U	4 U	5 U	5 U	5 U
METHYL CYCLOHEXANE	260000	6 U	4 U	4 U	5 U	5 U	5 U
METHYL TERT-BUTYL ETHER	62000	6 U	4 U	4 U	5 U	5 U	5 U
METHYLENE CHLORIDE	9100	18 U	14 U	12 U	12 U	12 U	16 U
O-XYLENE		6 U	4 U	4 U	5 U	5 U	5 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB11	SWOS-S-SB12	SWOS-S-SB12	SWOS-S-SB13	SWOS-S-SB13	SWOS-S-SB14
	SAMPLE NUMBER	SWOS-S-SB11-0305	SWOS-S-SB12-0103	SWOS-S-SB12-0507	SWOS-S-SB13-0103	SWOS-S-SB13-0507	SWOS-S-SB14-0001
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** [(1)]						
P-XYLENE		6 U	4 U	4 U	5 U	5 U	5 U
STYRENE	13000[(2)]	6 U	4 U	4 U	2 J	5 U	5 U
TETRACHLOROETHENE	1500	6 U	4 U	4 U	5 U	5 U	5 U
TOLUENE	52000	6 U	4 U	1 J	5 U	5 U	5 U
TOTAL XYLENES	27000	6 U	4 U	4 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	6900	6 U	4 U	4 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE		6 U	4 U	4 U	5 U	5 U	5 U
TRICHLOROETHENE	53	6 U	4 U	4 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	39000	6 U	4 U	4 U	5 U	5 U	5 U
VINYL CHLORIDE	20[(2)]	6 U	4 U	4 U	5 U	5 U	5 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)							
1,1-BIPHENYL		370 U	380 U	370 U	360 U	420 U	79 J
2,2'-OXYBIS(1-CHLOROPROPANE)	2900	370 U	380 U	370 U	360 U	420 U	390 U
2,4,5-TRICHLOROPHENOL	330000[(2)]	750 U	770 U	760 U	740 U	860 U	800 U
2,4,6-TRICHLOROPHENOL	610	370 U	380 U	370 U	360 U	420 U	390 U
2,4-DICHLOROPHENOL	18000	370 U	380 U	370 U	360 U	420 U	390 U
2,4-DIMETHYLPHENOL	120000	370 U	380 U	370 U	360 U	420 U	390 U
2,4-DINITROPHENOL	12000	750 U	770 U	760 U	740 U	860 U	800 U
2,4-DINITROTOLUENE	900[(2)]	370 U	380 U	370 U	360 U	420 U	390 U
2,6-DINITROTOLUENE	6100	370 U	380 U	370 U	360 U	420 U	390 U
2-CHLORONAPHTHALENE	490000	370 U	380 U	370 U	360 U	420 U	390 U
2-CHLOROPHENOL	6300	370 U	380 U	370 U	360 U	420 U	390 U
2-METHYLNAPHTHALENE		370 U	41 J	31000	89 J	16000	510
2-METHYLPHENOL	310000	370 U	380 U	370 U	360 U	420 U	390 U
2-NITROANILINE	170	750 U	770 U	760 U	740 U	860 U	800 U
2-NITROPHENOL		370 U	380 U	370 U	360 U	420 U	390 U
3,3'-DICHLOROBENZIDINE	1100	370 U	380 U	370 U	360 U	420 U	390 U
3-NITROANILINE		750 U	770 U	760 U	740 U	860 U	800 UJ
4,6-DINITRO-2-METHYLPHENOL		750 U	770 U	760 U	740 U	860 U	800 U
4-BROMOPHENYL PHENYL ETHER		370 U	380 U	370 U	360 U	420 U	390 U
4-CHLORO-3-METHYLPHENOL		370 U	380 U	370 U	360 U	420 U	390 U
4-CHLOROANILINE	24000	370 U	380 U	370 U	360 U	420 U	390 U
4-CHLOROPHENYL PHENYL ETHER		370 U	380 U	370 U	360 U	420 U	390 U
4-METHYLPHENOL	31000	370 U	380 U	370 U	360 U	420 U	73 J
4-NITROANILINE		750 U	770 U	760 U	740 U	860 U	800 U
4-NITROPHENOL		750 U	770 U	760 U	740 U	860 U	800 U
ACENAPHTHENE	43000[(2)]	38 J	380 U	1900	360 U	1500	840
ACENAPHTHYLENE	5600	370 U	380 U	370 U	360 U	420 U	44 J
ACETOPHENONE		370 U	380 U	370 U	360 U	420 U	390 U
ANTHRACENE	35000[(2)]	140 J	47 J	370 U	48 J	420 U	1300
ATRAZINE	2200	370 U	380 U	370 U	360 U	420 U	390 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB11	SWOS-S-SB12	SWOS-S-SB12	SWOS-S-SB13	SWOS-S-SB13	SWOS-S-SB14
	SAMPLE NUMBER	SWOS-S-SB11-0305	SWOS-S-SB12-0103	SWOS-S-SB12-0507	SWOS-S-SB13-0103	SWOS-S-SB13-0507	SWOS-S-SB14-0001
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** [(1)]						
BENZALDEHYDE	610000	370 U	380 U	370 U	360 U	420 U	390 U
BENZO(A)ANTHRACENE	620	380	180 J	42 J	140 J	84 J	2300
BENZO(A)PYRENE	62	320 J	210 J	370 U	140 J	420 U	1700
BENZO(B)FLUORANTHENE	620	450	300 J	370 U	230 J	61 J	2500
BENZO(G,H,I)PERYLENE	800[(2)]	120 J	87 J	370 U	41 J	420 U	840
BENZO(K)FLUORANTHENE	900[(2)]	190 J	140 J	370 U	84 J	420 U	900
BIS(2-CHLOROETHOXY)METHANE		370 U	380 U	370 U	360 U	420 U	390 U
BIS(2-CHLOROETHYL)ETHER	210	370 U	380 U	370 U	360 U	420 U	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	59 J	66 J	53 J	61 J	56 J	40 J
BUTYL BENZYL PHTHALATE	1200000	370 U	380 U	370 U	360 U	420 U	390 U
CAPROLACTAM	3100000	370 U	380 U	370 U	360 U	420 U	390 U
CARBAZOLE	24000	64 J	380 U	370 U	360 U	420 U	980 J
CHRYSENE	400[(2)]	370 J	210 J	49 J	140 J	110 J	2200
DIBENZO(A,H)ANTHRACENE	62	370 U	380 U	370 U	360 UJ	420 U	230 J
DIBENZOFURAN	29000	370 U	380 U	1500	360 U	1300	540
DIETHYL PHTHALATE	340000[(2)]	370 U	380 U	370 U	360 U	420 U	390 U
DIMETHYL PHTHALATE	1900000[(2)]	370 U	380 U	370 U	360 U	420 U	390 U
DI-N-BUTYL PHTHALATE	610000	370 U	380 U	370 U	360 U	420 U	390 U
DI-N-OCTYL PHTHALATE	240000	370 U	380 U	370 U	360 UJ	420 U	390 U
FLUORANTHENE	20000[(2)]	890	380	190 J	220 J	300 J	5900
FLUORENE	28000[(2)]	53 J	380 U	2300	360 U	2000	870
HEXACHLOROBENZENE	300	370 U	380 U	370 U	360 U	420 U	390 U
HEXACHLOROBUTADIENE	6200	370 U	380 U	370 U	360 U	420 U	390 U
HEXACHLOROCYCLOPENTADIENE	37000	370 U	380 U	370 U	360 U	420 U	390 U
HEXACHLOROETHANE	35000	370 U	380 U	370 U	360 U	420 U	390 U
INDENO(1,2,3-CD)PYRENE	620	130 J	88 J	370 U	43 J	420 U	770
ISOPHORONE	510000	370 U	380 U	370 U	360 U	420 U	390 U
NAPHTHALENE	5600	370 U	380 U	5800	42 J	3000	1600
NITROBENZENE	2000	370 U	380 U	370 U	360 U	420 U	390 U
N-NITROSO-DI-N-PROPYLAMINE	69	370 U	380 U	370 U	360 U	420 U	390 U
N-NITROSODIPHENYLAMINE	99000	370 U	380 U	370 U	360 U	420 U	390 U
PENTACHLOROPHENOL	3000	750 U	770 U	760 U	740 U	860 U	800 U
PHENANTHRENE	40000[(2)]	740	210 J	4800	170 J	3600	6200
PHENOL	3700000	370 U	380 U	370 U	360 U	420 U	48 J
PYRENE	13000[(2)]	790	420	410	350 J	530	5500
TOTAL PAHs		4611	2313	46491	1737	27185	34204

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB11	SWOS-S-SB12	SWOS-S-SB12	SWOS-S-SB13	SWOS-S-SB13	SWOS-S-SB14
	SAMPLE NUMBER	SWOS-S-SB11-0305	SWOS-S-SB12-0103	SWOS-S-SB12-0507	SWOS-S-SB13-0103	SWOS-S-SB13-0507	SWOS-S-SB14-0001
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** [(1)]						
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)							
DIESEL RANGE ORGANICS	500[(2)]	26	130	4500	110	5000	140
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)							
GASOLINE RANGE ORGANICS		1.4 U	87 U	110	4.4 U	87	1.8 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)							
4,4'-DDD	2400	3.7 U	3.8 U	3.8 U	3.6 U	4.2 U	3.9 U
4,4'-DDE	1700	3.7 U	5.2	3.8 U	4.7	4.2 U	17
4,4'-DDT	1700	3.7 U	3.8 U	3.8 U	3.6 U	4.2 U	16
ALDRIN	29	1.9 U	2 U	1.9 U	1.9 U	2.2 U	2 U
ALPHA-BHC	90	1.9 U	2 U	1.9 U	1.9 U	2.2 U	2 U
ALPHA-CHLORDANE		1.9 U	2 U	1.9 U	1.9 U	2.2 U	2 U
BETA-BHC	320	1.9 U	2 U	1.9 U	1.9 U	2.2 U	R
DELTA-BHC		1.9 U	2 U	1.9 U	1.9 U	2.2 U	2 U
DIELDRIN	30	3.7 U	3.8 U	3.8 U	3.6 U	4.2 U	3.9 U
ENDOSULFAN I		1.9 U	2 U	1.9 U	1.9 U	2.2 U	2 U
ENDOSULFAN II		3.7 U	3.8 U	3.8 U	3.6 U	4.2 U	3.9 U
ENDOSULFAN SULFATE		3.7 U	3.8 U	3.8 U	3.6 U	4.2 U	R
ENDRIN	1800	3.7 U	3.8 U	3.8 U	3.6 U	4.2 U	3.9 U
ENDRIN ALDEHYDE		3.7 U	3.8 U	3.8 U	3.6 U	4.2 U	3.9 U
ENDRIN KETONE		3.7 U	3.8 U	3.8 U	3.6 U	4.2 U	3.9 U
GAMMA-BHC (LINDANE)	440	1.9 U	2 U	1.9 U	1.9 U	2.2 U	2 U
GAMMA-CHLORDANE		1.9 U	2 U	1.9 U	1.9 U	2.2 U	2 U
HEPTACHLOR	110	1.9 U	2 U	1.9 U	1.9 U	2.2 U	2 U
HEPTACHLOR EPOXIDE	53	1.9 U	2 U	1.9 U	1.9 U	2.2 U	2 U
METHOXYCHLOR	31000	19 U	20 U	19 U	19 U	22 U	20 U
TOXAPHENE	440	190 U	200 U	190 U	190 U	220 U	200 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)							
AROCLOR-1016	390	37 U	38 U	38 U	36 U	42 U	39 U
AROCLOR-1221	220	37 U	38 U	38 U	36 U	42 U	39 U
AROCLOR-1232		37 U	38 U	38 U	36 U	42 U	39 U
AROCLOR-1242		37 U	38 U	38 U	36 U	42 U	39 U
AROCLOR-1248		37 U	38 U	38 U	36 U	42 U	39 U
AROCLOR-1254		37 U	38 U	38 U	36 U	42 U	39 U
AROCLOR-1260		37 U	38 U	38 U	36 U	42 U	39 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB11	SWOS-S-SB12	SWOS-S-SB12	SWOS-S-SB13	SWOS-S-SB13	SWOS-S-SB14
	SAMPLE NUMBER	SWOS-S-SB11-0305	SWOS-S-SB12-0103	SWOS-S-SB12-0507	SWOS-S-SB13-0103	SWOS-S-SB13-0507	SWOS-S-SB14-0001
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL (1)**						
METALS BY METHOD 6010B (MG/KG)							
ALUMINUM	7600	12600 J	8010 J	7010 J	10400 J	7590 J	8320 J
ANTIMONY	3.1	0.15 UJ	0.27 UJ	0.058 UJ	0.15 UJ	0.058 UJ	0.16 UJ
ARSENIC	0.39	8.4 J	4.5 J	4.8 J	8.7 J	3.3 J	5.3 J
BARIUM	540	14.7 J	19.1 J	16.5 J	18.9 J	21.4 J	23.6 J
BERYLLIUM	0.4(2)	0.30 J	0.28 J	0.27 J	0.31 J	0.17 J	0.25 J
CADMIUM	3.7	0.038 UJ	0.046 UJ	0.0057 UJ	0.0080 UJ	0.64 J	0.026 UJ
CALCIUM		1020	2040	836	1760	745	2170
CHROMIUM	30	13.4 J	8.2 J	7.3 J	11.6 J	6.4	7.9
COBALT	900	10.7 J	7.0 J	8.4 J	9.8 J	7.5 J	6.1 J
COPPER	310	34.3 J	24.3 J	20.6 J	32.2 J	13.5 J	24.2 J
IRON	2300	38500	21500	21500	31500	9340	14800
LEAD	150(2)	33.6 J	42.4 J	5.9 J	44.2 J	12.8 J	35.5 J
MAGNESIUM		3090 J	2120 J	1930 J	3180 J	1320 J	1870 J
MANGANESE	180	257 J	245 J	289 J	320 J	133 J	239 J
NICKEL	160	16.1 J	11.7 J	12.2 J	17.2 J	6.6 J	10.2 J
POTASSIUM		313	309	408	400	259	421
SELENIUM	39	4.5 J	3.0 J	3.1 J	3.8 J	2.0 J	3.0 J
SILVER	39	0.018 UJ	0.018 UJ	0.020 UJ	0.018 UJ	0.020 UJ	0.019 UJ
SODIUM		31.1	41.6	41.7	54	63.2	43.5
THALLIUM	0.52	R	2.2 J	2.8 J	2.5 J	2.7 J	2.8 J
VANADIUM	55	15.5 J	13.4 J	12.9 J	15.8 J	13.0 J	15.1 J
ZINC	2300	87.3	57.0	31.2	77.8	75.4	52.3
METALS BY METHOD 7471A (MG/KG)							
MERCURY	2.3	0.020	0.061	0.0065 U	0.042	0.12	0.054

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15
	SAMPLE NUMBER	SWOS-S-SB14-0102	SWOS-S-SB14-0204	SWOS-S-SB15-0001	SWOS-S-SB15-0001-D	SWOS-S-SB15-0102	SWOS-S-SB15-0204
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB15-0001		
PARAMETER	**PAL [1]**						
VOLATILES BY METHOD 8260B (UG/KG)							
1,1,1-TRICHLOROETHANE	120000	5 U	6 U	5 U	3 U	7 U	7 U
1,1,2,2-TETRACHLOROETHANE	410	5 UJ	6 U	5 UJ	3 UJ	7 UJ	7 UJ
1,1,2-TRICHLOROETHANE	730	5 U	6 U	5 U	3 U	7 U	7 U
1,1,2-TRICHLOROTRIFLUOROETHANE	560000	5 U	6 U	5 U	3 U	7 U	7 U
1,1-DICHLOROETHANE	51000	5 U	6 U	5 U	3 U	7 U	7 U
1,1-DICHLOROETHENE	200[2]	5 U	6 U	5 U	3 U	7 U	7 U
1,2,4-TRICHLOROBENZENE	65000	5 UJ	6 U	5 UJ	3 UJ	7 UJ	7 UJ
1,2-DIBROMO-3-CHLOROPROPANE	450	5 UJ	6 U	5 UJ	3 UJ	7 UJ	7 UJ
1,2-DIBROMOETHANE	6.9	5 U	6 U	5 U	3 U	7 U	7 U
1,2-DICHLOROBENZENE	37000	5 UJ	6 U	5 UJ	3 UJ	7 UJ	7 UJ
1,2-DICHLOROETHANE	280	5 U	6 U	5 U	3 U	7 U	7 U
1,2-DICHLOROPROPANE	340	5 U	6 U	5 U	3 U	7 U	7 U
1,3-DICHLOROBENZENE	1600	5 UJ	6 U	5 UJ	3 UJ	7 UJ	7 UJ
1,4-DICHLOROBENZENE	3400	5 UJ	6 U	5 UJ	3 UJ	7 UJ	7 UJ
2-BUTANONE	730000	5 UJ	6 U	5 UJ	3 UJ	7 UJ	7 UJ
2-HEXANONE		5 U	6 U	5 U	3 U	7 U	7 U
4-METHYL-2-PENTANONE	79000	5 U	6 U	5 U	3 U	7 U	7 U
ACETONE	160000	220 U	220 UJ	160 UJ	160 U	230 UJ	340 UJ
BENZENE	600	5 U	6 U	5 U	3 U	7 U	7 U
BROMODICHLOROMETHANE	820	5 U	6 U	5 U	3 U	7 U	7 U
BROMOFORM	62000	5 U	6 U	5 U	3 U	7 U	7 U
BROMOMETHANE	390	5 U	6 U	5 U	3 U	7 U	7 U
CARBON DISULFIDE	36000	5 U	6 U	5 U	3 U	7 U	7 U
CARBON TETRACHLORIDE	250	5 U	6 U	5 U	3 U	7 U	7 U
CHLOROBENZENE	15000	5 U	6 U	5 U	3 U	7 U	7 U
CHLORODIBROMOMETHANE	1100	5 U	6 U	5 U	3 U	7 U	7 U
CHLOROETHANE	3000	5 U	6 U	5 U	3 U	7 U	7 U
CHLOROFORM	360	5 U	6 U	5 U	3 U	7 U	7 U
CHLOROMETHANE	1200	5 U	6 U	5 U	3 U	7 U	7 U
CIS-1,2-DICHLOROETHENE	4300	5 U	6 U	5 U	3 U	7 U	7 U
CIS-1,3-DICHLOROPROPENE		5 U	6 U	5 U	3 U	7 U	7 U
CYCLOHEXANE	14000	5 U	6 U	5 U	3 U	7 U	7 U
DICHLORODIFLUOROMETHANE	9400	5 U	6 U	5 U	3 U	7 U	7 U
ETHYLBENZENE	8900	5 U	6 U	5 U	3 U	7 U	7 U
ISOPROPYLBENZENE	57000	5 U	6 U	5 U	3 U	7 U	7 U
METHYL ACETATE	2200000	5 U	6 U	5 U	3 U	7 U	7 U
METHYL CYCLOHEXANE	260000	5 U	6 U	5 U	3 U	7 U	7 U
METHYL TERT-BUTYL ETHER	62000	5 U	6 U	5 U	3 U	7 U	7 U
METHYLENE CHLORIDE	9100	12 U	17 U	15 U	10 U	27 U	19 U
O-XYLENE		5 U	6 U	5 U	3 U	7 U	7 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15
	SAMPLE NUMBER	SWOS-S-SB14-0102	SWOS-S-SB14-0204	SWOS-S-SB15-0001	SWOS-S-SB15-0001-D	SWOS-S-SB15-0102	SWOS-S-SB15-0204
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB15-0001		
PARAMETER	**PAL (1)**						
P-XYLENE		5 U	6 U	5 U	3 U	7 U	7 U
STYRENE	13000(2)	5 U	6 U	5 U	3 U	7 U	7 U
TETRACHLOROETHENE	1500	5 U	6 U	5 U	3 U	7 U	7 U
TOLUENE	52000	5 U	6 U	5 U	3 U	7 U	7 U
TOTAL XYLENES	27000	5 U	6 U	5 U	3 U	7 U	7 U
TRANS-1,2-DICHLOROETHENE	6900	5 U	6 U	5 U	3 U	7 U	7 U
TRANS-1,3-DICHLOROPROPENE		5 U	6 U	5 U	3 U	7 U	7 U
TRICHLOROETHENE	53	5 U	6 U	5 U	3 U	7 U	7 U
TRICHLOROFLUOROMETHANE	39000	5 U	6 U	5 U	3 U	7 U	7 U
VINYL CHLORIDE	20(2)	5 U	6 U	5 U	3 U	7 U	7 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)							
1,1-BIPHENYL		390 U	350 U	380 U	380 U	380 U	2100 U
2,2'-OXYBIS(1-CHLOROPROPANE)	2900	390 U	350 U	380 U	380 U	380 U	2100 U
2,4,5-TRICHLOROPHENOL	330000(2)	790 U	710 U	780 U	770 U	770 U	4300 U
2,4,6-TRICHLOROPHENOL	610	390 U	350 U	380 U	380 U	380 U	2100 U
2,4-DICHLOROPHENOL	18000	390 U	350 U	380 U	380 U	380 U	2100 U
2,4-DIMETHYLPHENOL	120000	390 U	350 U	380 U	380 U	380 U	2100 U
2,4-DINITROPHENOL	12000	790 U	710 U	780 U	770 U	770 U	4300 U
2,4-DINITROTOLUENE	900(2)	390 U	350 U	380 U	380 U	380 U	2100 U
2,6-DINITROTOLUENE	6100	390 U	350 U	380 U	380 U	380 U	2100 U
2-CHLORONAPHTHALENE	490000	390 U	350 U	380 U	380 U	380 U	2100 U
2-CHLOROPHENOL	6300	390 U	350 U	380 U	380 U	380 U	2100 U
2-METHYLNAPHTHALENE		390 U	350 U	380 U	380 U	380 U	2100 U
2-METHYLPHENOL	310000	390 U	350 U	380 U	380 U	380 U	2100 U
2-NITROANILINE	170	790 U	710 U	780 U	770 U	770 U	4300 U
2-NITROPHENOL		390 U	350 U	380 U	380 U	380 U	2100 U
3,3'-DICHLOROBENZIDINE	1100	390 U	350 U	380 U	380 U	380 U	2100 UJ
3-NITROANILINE		790 UJ	710 UJ	780 U	770 U	770 UJ	4300 UJ
4,6-DINITRO-2-METHYLPHENOL		790 U	710 U	780 U	770 U	770 U	4300 U
4-BROMOPHENYL PHENYL ETHER		390 U	350 U	380 U	380 U	380 U	2100 U
4-CHLORO-3-METHYLPHENOL		390 U	350 U	380 U	380 U	380 U	2100 U
4-CHLOROANILINE	24000	390 U	350 U	380 U	380 U	380 U	2100 U
4-CHLOROPHENYL PHENYL ETHER		390 U	350 U	380 U	380 U	380 U	2100 U
4-METHYLPHENOL	31000	390 U	350 U	380 U	380 U	380 U	2100 U
4-NITROANILINE		790 U	710 U	780 U	770 U	770 U	4300 U
4-NITROPHENOL		790 U	710 U	780 U	770 U	770 U	4300 U
ACENAPHTHENE	43000(2)	390 U	350 U	73 J	53 J	47 J	2200 U
ACENAPHTHYLENE	5600	390 U	350 U	380 U	380 U	380 U	2100 U
ACETOPHENONE		390 U	350 U	380 U	380 U	380 U	2100 U
ANTHRACENE	35000(2)	69 J	350 U	170 J	98 J	84 J	2100 U
ATRAZINE	2200	390 U	350 U	380 U	380 U	380 U	2100 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15
	SAMPLE NUMBER	SWOS-S-SB14-0102	SWOS-S-SB14-0204	SWOS-S-SB15-0001	SWOS-S-SB15-0001-D	SWOS-S-SB15-0102	SWOS-S-SB15-0204
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB15-0001		
PARAMETER	**PAL [1]**						
BENZALDEHYDE	610000	390 U	350 U	380 U	380 U	380 U	2100 U
BENZO(A)ANTHRACENE	620	310 J	350 U	460	280 J	300 J	680 J
BENZO(A)PYRENE	62	240 J	350 U	410	270 J	230 J	540 J
BENZO(B)FLUORANTHENE	620	320 J	350 U	630	390 J	340 J	810 J
BENZO(G,H,I)PERYLENE	800[2]	170 J	350 U	130 J	80 J	160 J	2100 UJ
BENZO(K)FLUORANTHENE	900[2]	140 J	350 U	280 J	200 J	120 J	260 J
BIS(2-CHLOROETHOXY)METHANE		390 U	350 U	380 U	380 U	380 U	2100 U
BIS(2-CHLOROETHYL)ETHER	210	390 U	350 U	380 U	380 U	380 U	2100 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	63 J	49 J	81 J	97 J	100 J	2100 UJ
BUTYL BENZYL PHTHALATE	1200000	390 U	350 U	380 U	380 U	380 U	410 J
CAPROLACTAM	3100000	390 U	350 U	380 U	380 U	380 U	2100 U
CARBAZOLE	24000	45 J	350 UJ	85 J	51 J	64 J	2100 UJ
CHRYSENE	400[2]	240 J	350 U	430	270 J	280 J	680 J
DIBENZO(A,H)ANTHRACENE	62	390 U	350 U	380 U	380 UJ	40 J	2100 UJ
DIBENZOFURAN	29000	390 U	350 U	51 J	380 U	380 U	2100 U
DIETHYL PHTHALATE	340000[2]	390 U	350 U	380 U	380 U	380 U	2100 U
DIMETHYL PHTHALATE	1900000[2]	390 U	350 U	380 U	380 U	380 U	2100 U
DI-N-BUTYL PHTHALATE	610000	390 U	350 U	380 U	380 U	380 U	2100 U
DI-N-OCTYL PHTHALATE	240000	390 U	350 U	380 U	380 UJ	380 U	2100 U
FLUORANTHENE	20000[2]	520	350 U	920 J	550 J	510	940 J
FLUORENE	28000[2]	390 U	350 U	83 J	46 J	41 J	2100 U
HEXACHLOROBENZENE	300	390 U	350 U	380 U	380 U	380 U	2100 U
HEXACHLOROBUTADIENE	6200	390 U	350 U	380 U	380 U	380 U	2100 U
HEXACHLOROCYCLOPENTADIENE	37000	390 U	350 U	380 U	380 U	380 U	2100 U
HEXACHLOROETHANE	35000	390 U	350 U	380 U	380 U	380 U	2100 U
INDENO(1,2,3-CD)PYRENE	620	150 J	350 U	130 J	82 J	140 J	360 J
ISOPHORONE	510000	390 U	350 U	380 U	380 U	380 U	2100 U
NAPHTHALENE	5600	390 U	350 U	65 J	380 U	380 U	2100 U
NITROBENZENE	2000	390 U	350 U	380 U	380 U	380 U	2100 U
N-NITROSO-DI-N-PROPYLAMINE	69	390 U	350 U	380 U	380 U	380 U	2100 U
N-NITROSODIPHENYLAMINE	99000	390 U	350 U	380 U	380 U	380 U	2100 U
PENTACHLOROPHENOL	3000	790 U	710 U	780 U	770 U	770 U	4300 U
PHENANTHRENE	40000[2]	320 J	350 U	700	430	400	660 J
PHENOL	3700000	390 U	350 U	380 U	380 U	380 U	2100 U
PYRENE	13000[2]	550	41 J	1000	720	580	1200 J
TOTAL PAHs		3029	41	5481	3469	3272	6130

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15
	SAMPLE NUMBER	SWOS-S-SB14-0102	SWOS-S-SB14-0204	SWOS-S-SB15-0001	SWOS-S-SB15-0001-D	SWOS-S-SB15-0102	SWOS-S-SB15-0204
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB15-0001		
PARAMETER	**PAL** [1]						
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)							
DIESEL RANGE ORGANICS	500[2]	56	97	66	52	290	550
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)							
GASOLINE RANGE ORGANICS		2.4 U	2.1 U	1.9 U	2.2 U	2.7 U	4.0 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)							
4,4'-DDD	2400	3.9 U	3.5 U	3.8 U	3.8 U	31 J	49 J
4,4'-DDE	1700	14	3.5 U	11	11	80	37
4,4'-DDT	1700	9.8	3.5 U	10 J	8.9	67	15
ALDRIN	29	2 U	1.8 U	2 U	2 U	3.9 U	2.2 U
ALPHA-BHC	90	2 U	1.8 U	2 U	2 U	3.9 U	2.2 U
ALPHA-CHLORDANE		2 U	1.8 U	2 U	2 U	8.2 J	7.4 J
BETA-BHC	320	R	1.8 U	4 J	3.8 J	R	2.2 U
DELTA-BHC		2 U	1.8 U	2 U	2 U	3.9 U	2.2 U
DIELDRIN	30	3.9 U	3.5 U	3.8 U	3.8 U	7.6 U	4.3 U
ENDOSULFAN I		2 U	1.8 U	2 U	2 U	3.9 U	2.2 U
ENDOSULFAN II		3.9 U	3.5 U	3.8 U	3.8 U	7.6 U	4.3 U
ENDOSULFAN SULFATE		3.9 U	3.5 U	3.8 U	3.8 U	7.6 UJ	4.3 UJ
ENDRIN	1800	3.9 U	3.5 U	3.8 U	3.8 U	9.8 J	4.3 U
ENDRIN ALDEHYDE		3.9 U	3.5 U	3.8 U	3.8 U	7.6 U	5.3 J
ENDRIN KETONE		3.9 U	3.5 U	3.8 U	3.8 U	7.6 UJ	R
GAMMA-BHC (LINDANE)	440	2 U	1.8 U	2 U	2 U	3.9 U	2.2 U
GAMMA-CHLORDANE		2 U	1.8 U	2 U	2 U	7.8 J	10
HEPTACHLOR	110	2 U	1.8 U	2 U	2 U	3.9 U	2.2 U
HEPTACHLOR EPOXIDE	53	2 U	1.8 U	2 U	2 U	3.9 U	2.2 U
METHOXYCHLOR	31000	20 U	18 U	20 U	20 U	39 U	22 U
TOXAPHENE	440	200 U	180 U	200 U	200 U	390 U	220 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)							
AROCLOR-1016	390	39 U	35 U	38 U	38 U	38 U	43 U
AROCLOR-1221	220	39 U	35 U	38 U	38 U	38 U	43 U
AROCLOR-1232		39 U	35 U	38 U	38 U	38 U	43 U
AROCLOR-1242		39 U	35 U	38 U	38 U	38 U	43 U
AROCLOR-1248		39 U	35 U	38 U	38 U	38 U	43 U
AROCLOR-1254		39 U	35 U	38 U	38 U	38 U	43 U
AROCLOR-1260		39 U	35 U	38 U	38 U	38 U	43 U

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NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB14	SWOS-S-SB14	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15	SWOS-S-SB15
	SAMPLE NUMBER	SWOS-S-SB14-0102	SWOS-S-SB14-0204	SWOS-S-SB15-0001	SWOS-S-SB15-0001-D	SWOS-S-SB15-0102	SWOS-S-SB15-0204
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05	03/16/05
	QC IDENTIFIER			Field Dup.	Field Dup.		
	DUPLICATE				SWOS-S-SB15-0001		
PARAMETER	**PAL (1)**						
METALS BY METHOD 6010B (MG/KG)							
ALUMINUM	7600	10400 J	3590 J	10700 J	11400 J	9850 J	8230 J
ANTIMONY	3.1	0.090 UJ	0.055 UJ	1.3 UJ	2.4 J	13.4 J	105 J
ARSENIC	0.39	8.2 J	2.4 J	9.3 J	10.1 J	9.7 J	6.9 J
BARIUM	540	21.0 J	8.1 J	25.8 J	27.3 J	70.5 J	82.1 J
BERYLLIUM	0.4(2)	0.30 J	0.17 J	0.38 J	0.38 J	0.31 J	0.25 J
CADMIUM	3.7	0.036 UJ	0.0054 UJ	0.043 UJ	0.059 UJ	0.22 J	0.82 J
CALCIUM		1780	725	2070	3050	2320	2510
CHROMIUM	30	11.6 J	3.3 J	15.1 J	13.7 J	14.4 J	14.7
COBALT	900	9.4 J	3.4 J	9.8 J	9.8 J	9.2 J	7.8 J
COPPER	310	28.5 J	11.1 J	36.0 J	35.0 J	37.5 J	50.6 J
IRON	2300	23800	8430	35700	33800	33300	16600
LEAD	150(2)	40.3 J	6.5 J	60.2 J	71.2 J	607 J	1010 J
MAGNESIUM		2710 J	1280 J	2980 J	3320 J	2650 J	2030 J
MANGANESE	180	306 J	152 J	347 J	366 J	310 J	193 J
NICKEL	160	15.6 J	5.2 J	16.8 J	16.5 J	15.6 J	14.6 J
POTASSIUM		375	334	536	533	294	273
SELENIUM	39	3.4 J	1.3 J	4.0 J	3.9 J	3.3 J	3.4 J
SILVER	39	0.019 UJ	0.019 UJ	0.021 UJ	0.017 UJ	0.019 UJ	0.021 UJ
SODIUM		49.5	27.4	46.7	50.5	44.1	45.8
THALLIUM	0.52	2.9 J	1.6 J	3.2 J	2.9 J	2.7 J	2.5 J
VANADIUM	55	16.7 J	5.7 J	18.7 J	19.1 J	20.4 J	25.4 J
ZINC	2300	64.6	21.9	88.6	83.6	220	439
METALS BY METHOD 7471A (MG/KG)							
MERCURY	2.3	0.076	0.0065 U	0.061	0.050	0.12	0.25

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB17	SWOS-S-SB17	SWOS-S-SB17
	SAMPLE NUMBER	SWOS-S-SB16-0001	SWOS-S-SB16-0102	SWOS-S-SB16-0406	SWOS-S-SB17-0001	SWOS-S-SB17-0102	SWOS-S-SB17-0102-D
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER					Field Dup.	Field Dup.
	DUPLICATE						SWOS-S-SB17-0102
PARAMETER	**PAL** [(1)]						
VOLATILES BY METHOD 8260B (UG/KG)							
1,1,1-TRICHLOROETHANE	120000	4 U	5 U	3 U	5 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	410	4 UJ	5 U	3 U	5 U	5 U	5 U
1,1,2-TRICHLOROETHANE	730	4 U	5 U	3 U	5 U	5 U	5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	560000	4 U	5 U	3 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	51000	4 U	5 U	3 U	5 U	5 U	5 U
1,1-DICHLOROETHENE	200[(2)]	4 U	5 U	3 U	5 U	5 U	5 U
1,2,4-TRICHLOROBENZENE	65000	4 UJ	5 U	3 U	5 U	5 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	450	4 UJ	5 U	3 U	5 U	5 U	5 U
1,2-DIBROMOETHANE	6.9	4 U	5 U	3 U	5 U	5 U	5 U
1,2-DICHLOROBENZENE	37000	4 UJ	5 U	3 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	280	4 U	5 U	3 U	5 U	5 U	5 U
1,2-DICHLOROPROPANE	340	4 U	5 U	3 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	1600	4 UJ	5 U	3 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	3400	4 UJ	5 U	3 U	5 U	5 U	5 U
2-BUTANONE	730000	4 UJ	5 U	3 UJ	5 UJ	5 U	5 U
2-HEXANONE		4 U	5 U	3 U	5 U	5 UJ	5 UJ
4-METHYL-2-PENTANONE	79000	4 U	5 U	3 U	5 U	5 U	5 U
ACETONE	160000	180 UJ	190 UJ	170 UJ	200 UJ	150 UJ	140 UJ
BENZENE	600	4 U	5 U	3 U	5 U	5 U	5 U
BROMODICHLOROMETHANE	820	4 U	5 U	3 U	5 U	5 U	5 U
BROMOFORM	62000	4 U	5 U	3 UJ	5 UJ	5 U	5 U
BROMOMETHANE	390	4 U	5 U	3 U	5 U	5 U	5 U
CARBON DISULFIDE	36000	4 U	5 U	3 U	5 U	5 U	5 U
CARBON TETRACHLORIDE	250	4 U	5 U	3 U	5 U	5 U	5 U
CHLOROBENZENE	15000	4 U	5 U	3 U	5 U	5 U	5 U
CHLORODIBROMOMETHANE	1100	4 U	5 U	3 U	5 U	5 U	5 U
CHLOROETHANE	3000	4 U	5 U	3 U	5 U	5 U	5 U
CHLOROFORM	360	4 U	5 U	3 U	5 U	5 U	5 U
CHLOROMETHANE	1200	4 U	5 U	3 U	5 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	4300	4 U	5 U	3 U	5 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE		4 U	5 U	3 U	5 U	5 U	5 U
CYCLOHEXANE	14000	4 U	5 U	3 U	5 U	5 U	5 U
DICHLORODIFLUOROMETHANE	9400	4 U	5 U	3 U	5 U	5 U	5 U
ETHYLBENZENE	8900	4 U	5 U	3 U	5 U	5 U	5 U
ISOPROPYLBENZENE	57000	4 U	5 U	3 U	5 U	5 U	5 U
METHYL ACETATE	2200000	4 U	5 U	3 U	5 U	5 U	5 U
METHYL CYCLOHEXANE	260000	4 U	5 U	3 U	5 U	5 U	5 U
METHYL TERT-BUTYL ETHER	62000	4 U	5 U	3 U	5 U	5 U	5 U
METHYLENE CHLORIDE	9100	14 U	16 U	8 U	9 U	11 U	14 U
O-XYLENE		4 U	5 U	3 U	5 U	5 U	5 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB17	SWOS-S-SB17	SWOS-S-SB17
	SAMPLE NUMBER	SWOS-S-SB16-0001	SWOS-S-SB16-0102	SWOS-S-SB16-0406	SWOS-S-SB17-0001	SWOS-S-SB17-0102	SWOS-S-SB17-0102-D
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER					Field Dup.	Field Dup.
	DUPLICATE						SWOS-S-SB17-0102
PARAMETER	**PAL (1)**						
P-XYLENE		4 U	5 U	3 U	5 U	5 U	5 U
STYRENE	13000(2)	4 U	5 U	3 U	5 U	5 U	5 U
TETRACHLOROETHENE	1500	4 U	5 U	3 UJ	5 UJ	5 U	5 U
TOLUENE	52000	4 U	5 U	3 U	5 U	5 U	5 U
TOTAL XYLENES	27000	4 U	5 U	3 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	6900	4 U	5 U	3 U	5 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE		4 U	5 U	3 U	5 U	5 U	5 U
TRICHLOROETHENE	53	4 U	5 U	3 U	5 U	5 U	5 U
TRICHLOROFLUOROMETHANE	39000	4 U	5 U	3 U	5 U	5 U	5 U
VINYL CHLORIDE	20(2)	4 U	5 U	3 U	5 U	5 U	5 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)							
1,1-BIPHENYL		350 U	460 U	370 U	420 U	380 U	380 U
2,2'-OXYBIS(1-CHLOROPROPANE)	2900	350 U	460 U	370 U	420 U	380 U	380 U
2,4,5-TRICHLOROPHENOL	330000(2)	700 U	930 U	750 U	850 U	760 U	760 U
2,4,6-TRICHLOROPHENOL	610	350 U	460 U	370 U	420 U	380 U	380 U
2,4-DICHLOROPHENOL	18000	350 U	460 U	370 U	420 U	380 U	380 U
2,4-DIMETHYLPHENOL	120000	350 U	460 U	370 U	420 UJ	380 U	380 U
2,4-DINITROPHENOL	12000	700 U	930 U	750 U	R	760 U	760 U
2,4-DINITROTOLUENE	900(2)	350 U	460 U	370 U	420 U	380 U	380 U
2,6-DINITROTOLUENE	6100	350 U	460 U	370 U	420 U	380 U	380 U
2-CHLORONAPHTHALENE	490000	350 U	460 U	370 U	420 U	380 U	380 U
2-CHLOROPHENOL	6300	350 U	460 U	370 U	420 U	380 U	380 U
2-METHYLNAPHTHALENE		350 U	460 U	93 J	420 U	380 U	380 U
2-METHYLPHENOL	310000	350 U	460 U	370 U	420 U	380 U	380 U
2-NITROANILINE	170	700 U	930 U	750 U	850 U	760 U	760 U
2-NITROPHENOL		350 U	460 U	370 U	420 U	380 U	380 U
3,3'-DICHLOROBENZIDINE	1100	350 UJ	460 U	370 U	420 UJ	380 U	380 U
3-NITROANILINE		700 UJ	930 UJ	750 U	850 U	760 U	760 U
4,6-DINITRO-2-METHYLPHENOL		700 U	930 U	750 U	R	760 U	760 U
4-BROMOPHENYL PHENYL ETHER		350 U	460 U	370 U	420 U	380 U	380 U
4-CHLORO-3-METHYLPHENOL		350 U	460 U	370 U	420 U	380 U	380 U
4-CHLOROANILINE	24000	350 U	460 U	370 U	420 U	380 U	380 U
4-CHLOROPHENYL PHENYL ETHER		350 U	460 U	370 U	420 U	380 U	380 U
4-METHYLPHENOL	31000	350 U	460 U	370 U	420 U	380 U	380 U
4-NITROANILINE		700 U	930 U	750 U	850 U	760 U	760 U
4-NITROPHENOL		700 U	930 U	750 U	850 U	760 U	760 U
ACENAPHTHENE	43000(2)	350 U	460 U	390	45 J	380 U	380 U
ACENAPHTHYLENE	5600	350 U	460 U	160 J	420 U	380 U	380 U
ACETOPHENONE		350 U	460 U	370 U	420 U	380 U	380 U
ANTHRACENE	35000(2)	110 J	82 J	1800	85 J	68 J	380 UJ
ATRAZINE	2200	350 U	460 U	370 U	420 U	380 U	380 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB17	SWOS-S-SB17	SWOS-S-SB17
	SAMPLE NUMBER	SWOS-S-SB16-0001	SWOS-S-SB16-0102	SWOS-S-SB16-0406	SWOS-S-SB17-0001	SWOS-S-SB17-0102	SWOS-S-SB17-0102-D
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER					Field Dup.	Field Dup.
	DUPLICATE						SWOS-S-SB17-0102
PARAMETER	**PAL (1)**						
BENZALDEHYDE	610000	350 U	460 U	370 U	420 U	380 U	380 U
BENZO(A)ANTHRACENE	620	380 J	230 J	2800	330 J	230 J	160 J
BENZO(A)PYRENE	62	300 J	180 J	2000	270 J	220 J	150 J
BENZO(B)FLUORANTHENE	620	400 J	240 J	2600	430 J	300 J	220 J
BENZO(G,H,I)PERYLENE	800(2)	200 J	120 J	920	150 J	380 UJ	380 UJ
BENZO(K)FLUORANTHENE	900(2)	190 J	99 J	990	140 J	130 J	88 J
BIS(2-CHLOROETHOXY)METHANE		350 U	460 U	370 U	420 U	380 U	380 U
BIS(2-CHLOROETHYL)ETHER	210	350 U	460 U	370 U	420 U	380 U	380 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	41 J	62 J	74 J	85 J	70 J	60 J
BUTYL BENZYL PHTHALATE	1200000	350 UJ	460 U	370 U	420 U	380 U	380 U
CAPROLACTAM	3100000	350 U	460 U	370 U	420 U	380 U	380 U
CARBAZOLE	24000	61 J	52 J	430	84 J	42 J	380 U
CHRYSENE	400(2)	360 J	210 J	2000	280 J	250 J	130 J
DIBENZO(A,H)ANTHRACENE	62	350 UJ	460 U	250 J	420 UJ	380 UJ	380 UJ
DIBENZOFURAN	29000	350 U	460 U	310 J	420 U	380 U	380 U
DIETHYL PHTHALATE	340000(2)	350 U	460 U	370 U	420 U	380 U	380 U
DIMETHYL PHTHALATE	1900000(2)	350 U	460 U	370 U	420 U	380 U	380 U
DI-N-BUTYL PHTHALATE	610000	350 U	460 U	370 U	420 U	380 U	380 U
DI-N-OCTYL PHTHALATE	240000	350 UJ	460 U	370 U	420 UJ	380 UJ	380 UJ
FLUORANTHENE	20000(2)	600	410 J	6600	580	440	230 J
FLUORENE	28000(2)	37 J	460 U	600	43 J	380 U	380 U
HEXACHLOROBENZENE	300	350 U	460 U	370 U	420 U	380 U	380 U
HEXACHLOROBUTADIENE	6200	350 U	460 U	370 U	420 U	380 U	380 U
HEXACHLOROCYCLOPENTADIENE	37000	350 U	460 U	370 U	420 U	380 U	380 U
HEXACHLOROETHANE	35000	350 U	460 U	370 U	420 UJ	380 U	380 U
INDENO(1,2,3-CD)PYRENE	620	170 J	100 J	820	140 J	110 J	90 J
ISOPHORONE	510000	350 U	460 U	370 U	420 U	380 U	380 U
NAPHTHALENE	5600	350 U	66 J	370 U	420 U	380 U	380 U
NITROBENZENE	2000	350 U	460 U	370 U	420 U	380 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	69	350 U	460 U	370 U	420 U	380 U	380 U
N-NITROSODIPHENYLAMINE	99000	350 U	460 U	370 U	420 U	380 U	380 U
PENTACHLOROPHENOL	3000	700 U	930 U	750 U	850 U	760 U	760 U
PHENANTHRENE	40000(2)	400	350 J	6200	410 J	290 J	120 J
PHENOL	3700000	350 U	460 U	370 U	420 U	380 U	380 U
PYRENE	13000(2)	700 J	390 J	5400	650	550	310 J
TOTAL PAHs		3847	2477	33623	3553	2588	1498

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB17	SWOS-S-SB17	SWOS-S-SB17
	SAMPLE NUMBER	SWOS-S-SB16-0001	SWOS-S-SB16-0102	SWOS-S-SB16-0406	SWOS-S-SB17-0001	SWOS-S-SB17-0102	SWOS-S-SB17-0102-D
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER					Field Dup.	Field Dup.
	DUPLICATE						SWOS-S-SB17-0102
PARAMETER	**PAL** [1]						
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)							
DIESEL RANGE ORGANICS	500[2]	55	47	85	68	110	150
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)							
GASOLINE RANGE ORGANICS		2.0 U	2.1 U	2	2.4	2.2	1.5
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)							
4,4'-DDD	2400	3.5 U	4.6 U	3.7 U	4.2 U	3.7 U	3.7 U
4,4'-DDE	1700	7.6	4.6 U	3.7 U	41	5.5	5.5
4,4'-DDT	1700	9 J	4.6 U	3.7 U	46	7	6.9
ALDRIN	29	1.8 U	2.4 U	1.9 U	2.2 U	1.9 U	1.9 U
ALPHA-BHC	90	1.8 U	2.4 U	1.9 U	2.2 U	1.9 U	1.9 U
ALPHA-CHLORDANE		1.8 U	2.4 U	1.9 U	3 J	1.9 U	1.9 U
BETA-BHC	320	5.1 J	4.7 J	1.9 U	2.2 U	1.9 U	1.9 U
DELTA-BHC		1.8 U	2.4 U	1.9 U	2.2 U	1.9 U	1.9 U
DIELDRIN	30	3.5 U	4.6 U	3.7 U	4.2 U	3.7 U	3.7 U
ENDOSULFAN I		1.8 U	2.4 U	1.9 U	2.2 U	1.9 U	1.9 U
ENDOSULFAN II		3.5 U	4.6 U	3.7 UJ	4.2 UJ	3.7 UJ	3.7 UJ
ENDOSULFAN SULFATE		3.5 UJ	4.6 UJ	3.7 UJ	4.2 UJ	3.7 UJ	3.7 UJ
ENDRIN	1800	3.5 U	4.6 U	3.7 U	4.2 U	3.7 U	3.7 U
ENDRIN ALDEHYDE		3.5 U	4.6 U	3.7 U	4.2 U	3.7 U	3.7 U
ENDRIN KETONE		3.5 UJ	4.6 UJ	3.7 U	4.2 U	3.7 U	3.7 U
GAMMA-BHC (LINDANE)	440	1.8 U	2.4 U	1.9 U	2.2 U	1.9 U	1.9 U
GAMMA-CHLORDANE		1.8 U	2.4 U	1.9 U	2.2 U	1.9 U	1.9 U
HEPTACHLOR	110	1.8 U	2.4 U	1.9 U	2.2 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	53	1.8 U	2.4 U	1.9 U	2.2 U	1.9 U	1.9 U
METHOXYCHLOR	31000	18 U	24 U	19 U	22 U	19 U	19 U
TOXAPHENE	440	180 U	240 U	190 U	220 U	190 U	190 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)							
AROCLOR-1016	390	35 U	46 U	37 U	42 U	37 U	37 U
AROCLOR-1221	220	35 U	46 U	37 U	42 U	37 U	37 U
AROCLOR-1232		35 U	46 U	37 U	42 U	37 U	37 U
AROCLOR-1242		35 U	46 U	37 U	42 U	37 U	37 U
AROCLOR-1248		35 U	46 U	37 U	42 U	37 U	37 U
AROCLOR-1254		35 U	46 U	37 U	42 U	37 U	37 U
AROCLOR-1260		63	46 U	37 U	42 U	37 U	37 U

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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB16	SWOS-S-SB17	SWOS-S-SB17	SWOS-S-SB17
	SAMPLE NUMBER	SWOS-S-SB16-0001	SWOS-S-SB16-0102	SWOS-S-SB16-0406	SWOS-S-SB17-0001	SWOS-S-SB17-0102	SWOS-S-SB17-0102-D
	SAMPLE DATE	03/16/05	03/16/05	03/16/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER					Field Dup.	Field Dup.
	DUPLICATE						SWOS-S-SB17-0102
PARAMETER	**PAL (1)**						
METALS BY METHOD 6010B (MG/KG)							
ALUMINUM	7600	7840 J	11600 J	11500	8340	7650	12400
ANTIMONY	3.1	0.21 UJ	0.065 UJ	0.057 UJ	0.26 UJ	0.23 UJ	0.22 UJ
ARSENIC	0.39	4.0 J	6.7 J	4.7 J	8.2 J	4.6 J	7.6 J
BARIUM	540	25.1 J	21.4 J	21.7 J	18.8 J	16.5 J	30.1 J
BERYLLIUM	0.4(2)	0.42 J	0.34 J	0.31	0.24	0.27	0.43
CADMIUM	3.7	0.012 UJ	0.0064 UJ	0.0056 UJ	0.016 UJ	0.0052 UJ	0.017 UJ
CALCIUM		1260	1560	1610	1360	1140	1790
CHROMIUM	30	6.0 J	12.1 J	13.6 J	10.0	9.6 J	14.9 J
COBALT	900	6.4 J	10.6 J	7.5 J	4.6 J	7.9 J	13.4 J
COPPER	310	18.5 J	34.6 J	55.8 J	28.5 J	26.8 J	45.5 J
IRON	2300	13100	40100	27500 J	15600 J	34400 J	42400 J
LEAD	150(2)	29.6 J	28.2 J	27.2 J	37.7 J	41.9 J	59.6 J
MAGNESIUM		1790 J	3080 J	3180 J	1480 J	2320 J	3540 J
MANGANESE	180	261 J	450 J	245 J	187 J	272 J	467 J
NICKEL	160	8.2 J	17.0 J	14.9 J	8.1 J	13.0 J	21.9 J
POTASSIUM		522	400	354 J	289 J	291 J	619 J
SELENIUM	39	2.4 J	4.3 J	3.4 J	3.0 J	3.3 J	4.4 J
SILVER	39	0.017 UJ	0.022 UJ	0.019 UJ	0.021 UJ	0.018 UJ	0.020 UJ
SODIUM		51.0	51.3	29.9	46.9	30.9	53.9
THALLIUM	0.52	3.0 J	3.4 J	2.7 J	3.2 J	R	3.5 J
VANADIUM	55	13.2 J	17.1 J	18.1 J	16.7 J	14.0 J	23.7 J
ZINC	2300	45.3	60.9	63.8 J	54.2 J	66.2 J	121 J
METALS BY METHOD 7471A (MG/KG)							
MERCURY	2.3	0.042	0.070	0.057	0.065	0.034	0.035

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB17	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB19	SWOS-S-SB19
	SAMPLE NUMBER	SWOS-S-SB17-0406	SWOS-S-SB18-0001	SWOS-S-SB18-0102	SWOS-S-SB18-0406	SWOS-S-SB19-0001	SWOS-S-SB19-0102
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL (1)**						
VOLATILES BY METHOD 8260B (UG/KG)							
1,1,1-TRICHLOROETHANE	120000	4 U	5 U	4 U	4 U	5 U	5 U
1,1,2,2-TETRACHLOROETHANE	410	4 U	5 U	4 U	4 UJ	5 U	5 U
1,1,2-TRICHLOROETHANE	730	4 U	5 U	4 U	4 U	5 U	5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	560000	4 U	5 U	4 U	4 U	5 U	5 U
1,1-DICHLOROETHANE	51000	4 U	5 U	4 U	4 U	5 U	5 U
1,1-DICHLOROETHENE	200(2)	4 U	5 U	4 U	4 U	5 U	5 U
1,2,4-TRICHLOROBENZENE	65000	4 U	5 U	4 U	4 UJ	5 U	5 U
1,2-DIBROMO-3-CHLOROPROPANE	450	4 U	5 U	4 U	4 UJ	5 U	5 U
1,2-DIBROMOETHANE	6.9	4 U	5 U	4 U	4 U	5 U	5 U
1,2-DICHLOROBENZENE	37000	4 U	5 U	4 U	4 UJ	5 U	5 U
1,2-DICHLOROETHANE	280	4 U	5 U	4 U	4 U	5 U	5 U
1,2-DICHLOROPROPANE	340	4 U	5 U	4 U	4 U	5 U	5 U
1,3-DICHLOROBENZENE	1600	4 U	5 U	4 U	4 UJ	5 U	5 U
1,4-DICHLOROBENZENE	3400	4 U	5 U	4 U	4 UJ	5 U	5 U
2-BUTANONE	730000	4 U	5 U	4 U	4 U	5 U	5 U
2-HEXANONE		4 UJ	5 UJ	4 UJ	4 UJ	5 UJ	5 UJ
4-METHYL-2-PENTANONE	79000	4 U	5 U	4 U	4 U	5 U	5 U
ACETONE	160000	130 UJ	150 UJ	290 UJ	44 UJ	550 UJ	130 UJ
BENZENE	600	4 U	5 U	4 U	4 U	5 U	5 U
BROMODICHLOROMETHANE	820	4 U	5 U	4 U	4 U	5 U	5 U
BROMOFORM	62000	4 U	5 U	4 U	4 U	5 U	5 U
BROMOMETHANE	390	4 U	5 U	4 U	4 U	5 U	5 U
CARBON DISULFIDE	36000	4 U	5 U	4 U	4 U	5 U	5 U
CARBON TETRACHLORIDE	250	4 U	5 U	4 U	4 U	5 U	5 U
CHLOROBENZENE	15000	4 U	5 U	4 U	4 U	5 U	5 U
CHLORODIBROMOMETHANE	1100	4 U	5 U	4 U	4 U	5 U	5 U
CHLOROETHANE	3000	4 U	5 U	4 U	4 U	5 U	5 U
CHLOROFORM	360	4 U	5 U	4 U	4 U	5 U	5 U
CHLOROMETHANE	1200	4 U	5 U	4 U	4 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	4300	4 U	5 U	4 U	4 U	5 U	5 U
CIS-1,3-DICHLOROPROPENE		4 U	5 U	4 U	4 U	5 U	5 U
CYCLOHEXANE	14000	4 U	5 U	4 U	4 U	5 U	5 U
DICHLORODIFLUOROMETHANE	9400	4 U	5 U	4 U	4 U	5 U	5 U
ETHYLBENZENE	8900	4 U	5 U	4 U	4 U	5 U	5 U
ISOPROPYLBENZENE	57000	4 U	5 U	4 U	18 J	5 U	5 U
METHYL ACETATE	2200000	4 U	5 U	4 U	4 U	5 U	5 U
METHYL CYCLOHEXANE	260000	4 U	5 U	4 U	30 J	5 U	5 U
METHYL TERT-BUTYL ETHER	62000	4 U	5 U	4 U	4 U	5 U	5 U
METHYLENE CHLORIDE	9100	13 U	12 U	4 U	10 U	8 U	13 U
O-XYLENE		4 U	5 U	4 U	4 U	5 U	5 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB17	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB19	SWOS-S-SB19
	SAMPLE NUMBER	SWOS-S-SB17-0406	SWOS-S-SB18-0001	SWOS-S-SB18-0102	SWOS-S-SB18-0406	SWOS-S-SB19-0001	SWOS-S-SB19-0102
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** [(1)]						
P-XYLENE		4 U	5 U	4 U	4 U	5 U	5 U
STYRENE	13000[(2)]	4 U	5 U	4 U	4 U	5 U	5 U
TETRACHLOROETHENE	1500	4 U	5 U	4 U	4 U	5 U	5 U
TOLUENE	52000	4 U	5 U	4 U	4 U	5 U	5 U
TOTAL XYLENES	27000	4 U	5 U	4 U	4 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	6900	4 U	5 U	4 U	4 U	5 U	5 U
TRANS-1,3-DICHLOROPROPENE		4 U	5 U	4 U	4 U	5 U	5 U
TRICHLOROETHENE	53	4 U	5 U	4 U	4 U	5 U	5 U
TRICHLOROFLUOROMETHANE	39000	1 J	5 U	4 U	4 U	1 J	5 U
VINYL CHLORIDE	20[(2)]	4 U	5 U	4 U	4 U	5 U	5 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)							
1,1-BIPHENYL		370 U	400 U	390 U	380 U	380 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	2900	370 U	400 U	390 U	380 U	380 U	360 U
2,4,5-TRICHLOROPHENOL	330000[(2)]	750 U	810 U	790 U	780 U	770 U	740 U
2,4,6-TRICHLOROPHENOL	610	370 U	400 U	390 U	380 U	380 U	360 U
2,4-DICHLOROPHENOL	18000	370 U	400 U	390 U	380 U	380 U	360 U
2,4-DIMETHYLPHENOL	120000	370 U	400 U	390 U	380 U	380 U	360 U
2,4-DINITROPHENOL	12000	750 U	810 U	790 U	780 U	770 U	740 U
2,4-DINITROTOLUENE	900[(2)]	370 U	400 U	390 U	380 U	380 U	360 U
2,6-DINITROTOLUENE	6100	370 U	400 U	390 U	380 U	380 U	360 U
2-CHLORONAPHTHALENE	490000	370 U	400 U	390 U	380 U	380 U	360 U
2-CHLOROPHENOL	6300	370 U	400 U	390 U	380 U	380 U	360 U
2-METHYLNAPHTHALENE		370 U	400 U	390 U	380 U	380 U	360 U
2-METHYLPHENOL	310000	370 U	400 U	390 U	380 U	380 U	360 U
2-NITROANILINE	170	750 U	810 U	790 U	780 U	770 U	740 U
2-NITROPHENOL		370 U	400 U	390 U	380 U	380 U	360 U
3,3'-DICHLOROBENZIDINE	1100	370 U	400 U	390 U	380 U	380 U	360 U
3-NITROANILINE		750 U	810 U	790 U	780 U	770 U	740 U
4,6-DINITRO-2-METHYLPHENOL		750 U	810 U	790 U	780 U	770 U	740 U
4-BROMOPHENYL PHENYL ETHER		370 U	400 U	390 U	380 U	380 U	360 U
4-CHLORO-3-METHYLPHENOL		370 U	400 U	390 U	380 U	380 U	360 U
4-CHLOROANILINE	24000	370 U	400 U	390 U	380 U	380 U	360 U
4-CHLOROPHENYL PHENYL ETHER		370 U	400 U	390 U	380 U	380 U	360 U
4-METHYLPHENOL	31000	370 U	400 U	390 U	380 U	380 U	360 U
4-NITROANILINE		750 U	810 U	790 U	780 U	770 U	740 U
4-NITROPHENOL		750 U	810 U	790 U	780 U	770 U	740 U
ACENAPHTHENE	43000[(2)]	370 U	400 U	390 U	390 U	380 U	370 U
ACENAPHTHYLENE	5600	370 U	400 U	390 U	380 U	380 U	360 U
ACETOPHENONE		370 U	400 U	390 U	380 U	380 U	360 U
ANTHRACENE	35000[(2)]	370 U	74 J	390 U	1000 J	44 J	360 U
ATRAZINE	2200	370 U	400 U	390 U	380 U	380 U	360 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB17	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB19	SWOS-S-SB19
	SAMPLE NUMBER	SWOS-S-SB17-0406	SWOS-S-SB18-0001	SWOS-S-SB18-0102	SWOS-S-SB18-0406	SWOS-S-SB19-0001	SWOS-S-SB19-0102
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** [(1)]						
BENZALDEHYDE	610000	370 U	400 U	390 U	380 U	380 U	360 U
BENZO(A)ANTHRACENE	620	370 U	250 J	110 J	380 U	270 J	160 J
BENZO(A)PYRENE	62	370 U	200 J	100 J	380 U	250 J	240 J
BENZO(B)FLUORANTHENE	620	370 U	300 J	130 J	380 U	320 J	290 J
BENZO(G,H,I)PERYLENE	800[(2)]	370 U	120 J	71 J	380 U	380 UJ	190 J
BENZO(K)FLUORANTHENE	900[(2)]	370 U	110 J	50 J	380 U	140 J	120 J
BIS(2-CHLOROETHOXY)METHANE		370 U	400 U	390 U	380 U	380 U	360 U
BIS(2-CHLOROETHYL)ETHER	210	370 U	400 U	390 U	380 U	380 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	60 J	51 J	54 J	380 U	63 J	66 J
BUTYL BENZYL PHTHALATE	1200000	370 U	400 U	390 U	380 U	380 U	360 U
CAPROLACTAM	3100000	370 U	400 U	390 U	380 U	380 U	360 U
CARBAZOLE	24000	370 U	400 U	390 U	380 U	380 U	360 U
CHRYSENE	400[(2)]	370 U	220 J	94 J	380 U	240 J	130 J
DIBENZO(A,H)ANTHRACENE	62	370 U	400 U	390 U	380 U	380 UJ	360 U
DIBENZOFURAN	29000	370 U	400 U	390 U	380 U	380 U	360 U
DIETHYL PHTHALATE	340000[(2)]	370 U	400 U	390 U	380 U	380 U	360 U
DIMETHYL PHTHALATE	1900000[(2)]	370 U	400 U	390 U	380 U	380 U	360 U
DI-N-BUTYL PHTHALATE	610000	370 U	400 U	390 U	380 U	380 U	360 U
DI-N-OCTYL PHTHALATE	240000	370 U	400 U	390 U	380 U	380 UJ	360 U
FLUORANTHENE	20000[(2)]	64 J	440	160 J	84 J	420	300 J
FLUORENE	28000[(2)]	370 U	400 U	390 U	1700 J	380 U	360 U
HEXACHLOROBENZENE	300	370 U	400 U	390 U	380 U	380 U	360 U
HEXACHLOROBUTADIENE	6200	370 U	400 U	390 U	380 U	380 U	360 U
HEXACHLOROCYCLOPENTADIENE	37000	370 U	400 U	390 U	380 U	380 U	360 U
HEXACHLOROETHANE	35000	370 U	400 U	390 U	380 U	380 U	360 U
INDENO(1,2,3-CD)PYRENE	620	370 U	100 J	390 U	380 U	380 UJ	150 J
ISOPHORONE	510000	370 U	400 U	390 U	380 U	380 U	360 U
NAPHTHALENE	5600	370 U	400 U	390 U	380 U	380 U	360 U
NITROBENZENE	2000	370 U	400 U	390 U	380 U	380 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	69	370 U	400 U	390 U	380 U	380 U	360 U
N-NITROSODIPHENYLAMINE	99000	370 U	400 U	390 U	380 U	380 U	360 U
PENTACHLOROPHENOL	3000	750 U	810 U	790 U	780 U	770 U	740 U
PHENANTHRENE	40000[(2)]	370 U	280 J	78 J	2500 J	200 J	56 J
PHENOL	3700000	370 U	400 U	390 U	380 U	380 U	360 U
PYRENE	13000[(2)]	55 J	410	190 J	680	620	350 J
TOTAL PAHs		119	2504	983	5964	2504	1986

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB17	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB19	SWOS-S-SB19
	SAMPLE NUMBER	SWOS-S-SB17-0406	SWOS-S-SB18-0001	SWOS-S-SB18-0102	SWOS-S-SB18-0406	SWOS-S-SB19-0001	SWOS-S-SB19-0102
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** [(1)]						
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)							
DIESEL RANGE ORGANICS	500[(2)]	21	94	74	3900	55	51
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)							
GASOLINE RANGE ORGANICS		1.9	1.9	1.4 U	110	2.4	1.5
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)							
4,4'-DDD	2400	3.7 U	4 U	39 U	3.8 U	3.8 U	3.7 U
4,4'-DDE	1700	3.7 U	25	290	3.8 U	23	4.8
4,4'-DDT	1700	3.7 U	23	250	3.8 U	24	5.9
ALDRIN	29	1.9 U	2.1 U	20 U	2 U	2 U	1.9 U
ALPHA-BHC	90	1.9 U	2.1 U	20 U	2 U	2 U	1.9 U
ALPHA-CHLORDANE		1.9 U	2.1 U	20 U	2 U	2 U	1.9 U
BETA-BHC	320	1.9 U	2.1 U	20 U	5.4 J	4.8 J	1.9 U
DELTA-BHC		1.9 U	2.1 U	20 U	2 U	2 U	1.9 U
DIELDRIN	30	3.7 U	4 U	39 U	3.8 U	3.8 U	3.7 U
ENDOSULFAN I		1.9 U	2.1 U	20 U	2 U	2 U	1.9 U
ENDOSULFAN II		3.7 UJ	4 U	39 U	3.8 U	3.8 U	3.7 U
ENDOSULFAN SULFATE		3.7 UJ	4 U	39 U	3.8 U	3.8 U	3.7 U
ENDRIN	1800	3.7 U	4 U	39 U	3.8 U	3.8 U	3.7 U
ENDRIN ALDEHYDE		3.7 U	4 U	39 U	3.8 U	3.8 U	3.7 U
ENDRIN KETONE		3.7 U	4 U	39 U	3.8 U	3.8 U	3.7 U
GAMMA-BHC (LINDANE)	440	1.9 U	2.1 U	20 U	2 U	2 U	1.9 U
GAMMA-CHLORDANE		1.9 U	2.1 U	20 U	2 U	2 U	1.9 U
HEPTACHLOR	110	1.9 U	2.1 U	20 U	2 U	2 U	1.9 U
HEPTACHLOR EPOXIDE	53	1.9 U	2.1 U	20 U	2 U	2 U	1.9 U
METHOXYCHLOR	31000	19 U	21 U	200 U	20 U	20 U	19 U
TOXAPHENE	440	190 U	210 U	2000 U	200 U	200 U	190 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)							
AROCLOR-1016	390	37 U	40 U	39 U	38 U	38 U	37 U
AROCLOR-1221	220	37 U	40 U	39 U	38 U	38 U	37 U
AROCLOR-1232		37 U	40 U	39 U	38 U	38 U	37 U
AROCLOR-1242		37 U	40 U	39 U	38 U	38 U	37 U
AROCLOR-1248		37 U	40 U	39 U	38 U	38 U	37 U
AROCLOR-1254		37 U	40 U	39 U	38 U	38 U	37 U
AROCLOR-1260		37 U	40 U	39 U	38 U	38 U	37 U

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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB17	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB18	SWOS-S-SB19	SWOS-S-SB19
	SAMPLE NUMBER	SWOS-S-SB17-0406	SWOS-S-SB18-0001	SWOS-S-SB18-0102	SWOS-S-SB18-0406	SWOS-S-SB19-0001	SWOS-S-SB19-0102
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER						
	DUPLICATE						
PARAMETER	**PAL** (1)						
METALS BY METHOD 6010B (MG/KG)							
ALUMINUM	7600	9080	11000	11600	18600	9680	11300
ANTIMONY	3.1	0.54 UJ	0.060 UJ	0.49 UJ	0.14 UJ	0.19 UJ	0.26 UJ
ARSENIC	0.39	6.3 J	6.5 J	8.4 J	7.0 J	6.0 J	10.0 J
BARIUM	540	18.3 J	28.7 J	28.7 J	7.9 J	24.3 J	22.6 J
BERYLLIUM	0.4(2)	0.36	0.32	0.48	0.42	0.27	0.36
CADMIUM	3.7	0.0057 UJ	0.015 UJ	0.0058 UJ	0.0056 UJ	0.034 UJ	0.0053 UJ
CALCIUM		991	1790	1620	2300	1520	1480
CHROMIUM	30	28.0	10.8 J	12.9 J	18.7 J	9.7 J	11.7 J
COBALT	900	8.9 J	7.4 J	10.9 J	17.1 J	7.0 J	12.0 J
COPPER	310	30.2 J	32.5 J	41.1 J	44.4 J	32.0 J	37.1 J
IRON	2300	25600 J	25200 J	36200 J	58500 J	26600 J	35800 J
LEAD	150(2)	76.5 J	44.1 J	71.1 J	13.1 J	41.5 J	25.7 J
MAGNESIUM		2430 J	2150 J	2810 J	5910 J	2180 J	3480 J
MANGANESE	180	336 J	280 J	410 J	348 J	345 J	433 J
NICKEL	160	14.4 J	12.1 J	18.1 J	27.8 J	11.3 J	18.2 J
POTASSIUM		379 J	436 J	329 J	308 J	401 J	546 J
SELENIUM	39	3.7 J	3.2 J	5.3 J	5.0 J	2.8 J	3.8 J
SILVER	39	0.02 UJ	0.020 UJ	0.020 UJ	0.019 UJ	0.018 UJ	0.018 UJ
SODIUM		45.9	53.7	52.8	28.5	47.5	60.9
THALLIUM	0.52	3.0 J	3.7 J	3.2 J	R	3.5 J	3.1 J
VANADIUM	55	15.6 J	19.4 J	22.4 J	25.8 J	17.7 J	19.3 J
ZINC	2300	48.7 J	82.2 J	79.1 J	83.3 J	60.6 J	80.6 J
METALS BY METHOD 7471A (MG/KG)							
MERCURY	2.3	0.015	0.060	0.045	0.0074 U	0.051	0.027

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
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APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB19	SWOS-S-SB20	SWOS-S-SB20	SWOS-S-SB20
	SAMPLE NUMBER	SWOS-S-SB19-0608	SWOS-S-SB20-0001	SWOS-S-SB20-0102	SWOS-S-SB20-0204
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER				
	DUPLICATE				
PARAMETER	**PAL [1]**				
VOLATILES BY METHOD 8260B (UG/KG)					
1,1,1-TRICHLOROETHANE	120000	4 U	4 U	5 U	4 U
1,1,2,2-TETRACHLOROETHANE	410	4 U	4 U	5 U	4 U
1,1,2-TRICHLOROETHANE	730	4 U	4 U	5 U	4 U
1,1,2-TRICHLOROTRIFLUOROETHANE	560000	4 U	4 U	5 U	4 U
1,1-DICHLOROETHANE	51000	4 U	4 U	5 U	4 U
1,1-DICHLOROETHENE	200[2]	4 U	4 U	5 U	4 U
1,2,4-TRICHLOROBENZENE	65000	4 U	4 U	5 U	4 U
1,2-DIBROMO-3-CHLOROPROPANE	450	4 U	4 U	5 U	4 U
1,2-DIBROMOETHANE	6.9	4 U	4 U	5 U	4 U
1,2-DICHLOROBENZENE	37000	4 U	4 U	5 U	4 U
1,2-DICHLOROETHANE	280	4 U	4 U	5 U	4 U
1,2-DICHLOROPROPANE	340	4 U	4 U	5 U	4 U
1,3-DICHLOROBENZENE	1600	4 U	4 U	5 U	4 U
1,4-DICHLOROBENZENE	3400	4 U	4 U	5 U	4 U
2-BUTANONE	730000	4 U	4 U	5 U	4 U
2-HEXANONE		4 UJ	4 UJ	5 UJ	4 UJ
4-METHYL-2-PENTANONE	79000	4 U	4 U	5 U	4 U
ACETONE	160000	6 UJ	4 UJ	31 UJ	14 UJ
BENZENE	600	4 U	4 U	5 U	4 U
BROMODICHLOROMETHANE	820	4 U	4 U	5 U	4 U
BROMOFORM	62000	4 U	4 U	5 U	4 U
BROMOMETHANE	390	4 U	4 U	5 U	4 U
CARBON DISULFIDE	36000	4 U	4 U	5 U	4 U
CARBON TETRACHLORIDE	250	4 U	4 U	5 U	4 U
CHLOROBENZENE	15000	4 U	4 U	5 U	4 U
CHLORODIBROMOMETHANE	1100	4 U	4 U	5 U	4 U
CHLOROETHANE	3000	4 U	4 U	5 U	4 U
CHLOROFORM	360	4 U	4 U	5 U	4 U
CHLOROMETHANE	1200	4 U	4 U	5 U	4 U
CIS-1,2-DICHLOROETHENE	4300	4 U	4 U	5 U	4 U
CIS-1,3-DICHLOROPROPENE		4 U	4 U	5 U	4 U
CYCLOHEXANE	14000	4 U	4 U	5 U	4 U
DICHLORODIFLUOROMETHANE	9400	4 U	4 U	5 U	4 U
ETHYLBENZENE	8900	4 U	4 U	5 U	4 U
ISOPROPYLBENZENE	57000	4 U	4 U	5 U	4 U
METHYL ACETATE	2200000	4 U	4 U	5 U	4 U
METHYL CYCLOHEXANE	260000	4 U	4 U	5 U	4 U
METHYL TERT-BUTYL ETHER	62000	4 U	4 U	5 U	4 U
METHYLENE CHLORIDE	9100	10 U	9 U	13 U	9 U
O-XYLENE		4 U	4 U	5 U	4 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB19	SWOS-S-SB20	SWOS-S-SB20	SWOS-S-SB20
	SAMPLE NUMBER	SWOS-S-SB19-0608	SWOS-S-SB20-0001	SWOS-S-SB20-0102	SWOS-S-SB20-0204
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER				
	DUPLICATE				
PARAMETER	**PAL [1]**				
P-XYLENE		4 U	4 U	5 U	4 U
STYRENE	13000[2]	4 U	4 U	5 U	4 U
TETRACHLOROETHENE	1500	4 U	4 U	5 U	4 U
TOLUENE	52000	4 U	4 U	5 U	4 U
TOTAL XYLENES	27000	4 U	4 U	5 U	4 U
TRANS-1,2-DICHLOROETHENE	6900	4 U	4 U	5 U	4 U
TRANS-1,3-DICHLOROPROPENE		4 U	4 U	5 U	4 U
TRICHLOROETHENE	53	4 U	4 U	5 U	4 U
TRICHLOROFLUOROMETHANE	39000	4 U	4 U	5 U	4 U
VINYL CHLORIDE	20[2]	4 U	4 U	5 U	4 U
SEMIVOLATILES BY METHOD 8270C (UG/KG)					
1,1-BIPHENYL		370 U	370 U	360 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)	2900	370 U	370 U	360 U	360 U
2,4,5-TRICHLOROPHENOL	330000[2]	760 U	750 U	740 U	740 U
2,4,6-TRICHLOROPHENOL	610	370 U	370 U	360 U	360 U
2,4-DICHLOROPHENOL	18000	370 U	370 U	360 U	360 U
2,4-DIMETHYLPHENOL	120000	370 U	370 U	360 U	360 U
2,4-DINITROPHENOL	12000	760 U	750 U	740 U	740 U
2,4-DINITROTOLUENE	900[2]	370 U	370 U	360 U	360 U
2,6-DINITROTOLUENE	6100	370 U	370 U	360 U	360 U
2-CHLORONAPHTHALENE	490000	370 U	370 U	360 U	360 U
2-CHLOROPHENOL	6300	370 U	370 U	360 U	360 U
2-METHYLNAPHTHALENE		370 U	370 U	360 U	360 U
2-METHYLPHENOL	310000	370 U	370 U	360 U	360 U
2-NITROANILINE	170	760 U	750 U	740 U	740 U
2-NITROPHENOL		370 U	370 U	360 U	360 U
3,3'-DICHLOROBENZIDINE	1100	370 U	370 U	360 U	360 U
3-NITROANILINE		760 U	750 U	740 U	740 U
4,6-DINITRO-2-METHYLPHENOL		760 U	750 U	740 U	740 U
4-BROMOPHENYL PHENYL ETHER		370 U	370 U	360 U	360 U
4-CHLORO-3-METHYLPHENOL		370 U	370 U	360 U	360 U
4-CHLOROANILINE	24000	370 U	370 U	360 U	360 U
4-CHLOROPHENYL PHENYL ETHER		370 U	370 U	360 U	360 U
4-METHYLPHENOL	31000	370 U	370 U	360 U	360 U
4-NITROANILINE		760 U	750 U	740 U	740 U
4-NITROPHENOL		760 U	750 U	740 U	740 U
ACENAPHTHENE	43000[2]	380 U	370 U	360 U	370 U
ACENAPHTHYLENE	5600	370 U	370 U	360 U	360 U
ACETOPHENONE		370 U	370 U	360 U	360 U
ANTHRACENE	35000[2]	370 U	59 J	360 UJ	360 U
ATRAZINE	2200	370 U	370 U	360 U	360 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB19	SWOS-S-SB20	SWOS-S-SB20	SWOS-S-SB20
	SAMPLE NUMBER	SWOS-S-SB19-0608	SWOS-S-SB20-0001	SWOS-S-SB20-0102	SWOS-S-SB20-0204
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER				
	DUPLICATE				
PARAMETER	**PAL [1]**				
BENZALDEHYDE	610000	370 U	370 U	360 U	360 U
BENZO(A)ANTHRACENE	620	370 U	190 J	80 J	360 U
BENZO(A)PYRENE	62	370 U	200 J	120 J	360 U
BENZO(B)FLUORANTHENE	620	370 U	300 J	190 J	360 U
BENZO(G,H,I)PERYLENE	800[2]	370 U	370 UJ	360 UJ	360 U
BENZO(K)FLUORANTHENE	900[2]	370 U	120 J	91 J	360 U
BIS(2-CHLOROETHOXY)METHANE		370 U	370 U	360 U	360 U
BIS(2-CHLOROETHYL)ETHER	210	370 U	370 U	360 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	35000	65 J	160 J	130 J	50 J
BUTYL BENZYL PHTHALATE	1200000	370 U	370 U	360 U	360 U
CAPROLACTAM	3100000	370 U	370 U	360 U	360 U
CARBAZOLE	24000	370 U	68 J	360 U	360 U
CHRYSENE	400[2]	370 U	250 J	120 J	360 U
DIBENZO(A,H)ANTHRACENE	62	370 U	370 UJ	360 UJ	360 U
DIBENZOFURAN	29000	370 U	370 U	360 U	360 U
DIETHYL PHTHALATE	340000[2]	370 U	370 U	360 U	360 U
DIMETHYL PHTHALATE	1900000[2]	370 U	370 U	360 U	360 U
DI-N-BUTYL PHTHALATE	610000	370 U	370 U	360 U	360 U
DI-N-OCTYL PHTHALATE	240000	370 U	370 UJ	360 UJ	360 U
FLUORANTHENE	20000[2]	370 U	420	170 J	360 U
FLUORENE	28000[2]	370 U	370 U	360 U	360 U
HEXACHLOROBENZENE	300	370 U	370 U	360 U	360 U
HEXACHLOROBUTADIENE	6200	370 U	370 U	360 U	360 U
HEXACHLOROCYCLOPENTADIENE	37000	370 U	370 U	360 U	360 U
HEXACHLOROETHANE	35000	370 U	370 U	360 U	360 U
INDENO(1,2,3-CD)PYRENE	620	370 U	110 J	77 J	360 U
ISOPHORONE	510000	370 U	370 U	360 U	360 U
NAPHTHALENE	5600	370 U	370 U	360 U	360 U
NITROBENZENE	2000	370 U	370 U	360 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	69	370 U	370 U	360 U	360 U
N-NITROSODIPHENYLAMINE	99000	370 U	370 U	360 U	360 U
PENTACHLOROPHENOL	3000	760 U	750 U	740 U	740 U
PHENANTHRENE	40000[2]	370 U	350 J	82 J	360 U
PHENOL	3700000	370 U	370 U	360 U	360 U
PYRENE	13000[2]	370 U	550	260 J	360 U
TOTAL PAHs			2549	1190	

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB19	SWOS-S-SB20	SWOS-S-SB20	SWOS-S-SB20
	SAMPLE NUMBER	SWOS-S-SB19-0608	SWOS-S-SB20-0001	SWOS-S-SB20-0102	SWOS-S-SB20-0204
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER				
	DUPLICATE				
PARAMETER	**PAL** [(1)]				
PETROLEUM HYDROCARBONS BY METHOD ETPH (MG/KG)					
DIESEL RANGE ORGANICS	500[(2)]	28	54	190	23
PETROLEUM HYDROCARBONS BY METHOD GRO (MG/KG)					
GASOLINE RANGE ORGANICS		2.1 U	1.4	1.9	1.3 U
PESTICIDES/PCBS BY METHOD 8081A (UG/KG)					
4,4'-DDD	2400	3.8 U	3.7 U	3.6 U	3.7 U
4,4'-DDE	1700	3.8 U	21	3.6 U	3.7 U
4,4'-DDT	1700	3.8 U	14	3.6 U	3.7 U
ALDRIN	29	1.9 U	1.9 U	1.9 U	1.9 U
ALPHA-BHC	90	1.9 U	1.9 U	1.9 U	1.9 U
ALPHA-CHLORDANE		1.9 U	1.9 U	1.9 U	1.9 U
BETA-BHC	320	1.9 U	1.9 U	1.9 U	1.9 U
DELTA-BHC		1.9 U	1.9 U	1.9 U	1.9 U
DIELDRIN	30	3.8 U	3.7 U	3.6 U	3.7 U
ENDOSULFAN I		1.9 U	1.9 U	1.9 U	1.9 U
ENDOSULFAN II		3.8 U	3.7 U	3.6 U	3.7 U
ENDOSULFAN SULFATE		3.8 U	3.7 U	3.6 U	3.7 U
ENDRIN	1800	3.8 U	3.7 U	3.6 U	3.7 U
ENDRIN ALDEHYDE		3.8 U	3.7 U	3.6 U	3.7 U
ENDRIN KETONE		3.8 U	3.7 U	3.6 U	3.7 U
GAMMA-BHC (LINDANE)	440	1.9 U	1.9 U	1.9 U	1.9 U
GAMMA-CHLORDANE		1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR	110	1.9 U	1.9 U	1.9 U	1.9 U
HEPTACHLOR EPOXIDE	53	1.9 U	1.9 U	1.9 U	1.9 U
METHOXYCHLOR	31000	19 U	19 U	19 U	19 U
TOXAPHENE	440	190 U	190 U	190 U	190 U
PESTICIDES/PCBS BY METHOD 8082 (UG/KG)					
AROCLOR-1016	390	38 U	37 U	36 U	37 U
AROCLOR-1221	220	38 U	37 U	36 U	37 U
AROCLOR-1232		38 U	37 U	36 U	37 U
AROCLOR-1242		38 U	37 U	36 U	37 U
AROCLOR-1248		38 U	37 U	36 U	37 U
AROCLOR-1254		38 U	37 U	36 U	37 U
AROCLOR-1260		38 U	37 U	36 U	37 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D1

SUMMARY OF ANALYTICAL RESULTS - SOIL
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	SWOS-S-SB19	SWOS-S-SB20	SWOS-S-SB20	SWOS-S-SB20
	SAMPLE NUMBER	SWOS-S-SB19-0608	SWOS-S-SB20-0001	SWOS-S-SB20-0102	SWOS-S-SB20-0204
	SAMPLE DATE	03/17/05	03/17/05	03/17/05	03/17/05
	QC IDENTIFIER				
	DUPLICATE				
PARAMETER	**PAL (1)**				
METALS BY METHOD 6010B (MG/KG)					
ALUMINUM	7600	9570	3230	9180	8120
ANTIMONY	3.1	0.26 UJ	0.052 UJ	0.054 UJ	0.12 UJ
ARSENIC	0.39	8.1 J	1.6 J	4.1 J	4.2 J
BARIUM	540	15.2 J	11.1 J	23.9 J	19.7 J
BERYLLIUM	0.4(2)	0.39	0.23	0.31	0.24
CADMIUM	3.7	0.0053 UJ	0.0051 UJ	0.0053 UJ	0.0054 UJ
CALCIUM		1230	507	1050	660
CHROMIUM	30	13.5 J	1.1 J	11.8 J	11.1 J
COBALT	900	14.7 J	1.5 J	8.3 J	5.3 J
COPPER	310	40.0 J	5.7 J	27.5 J	17.3 J
IRON	2300	43600 J	5640 J	24900 J	23200 J
LEAD	150(2)	12.0 J	4.9 J	21.7 J	6.4 J
MAGNESIUM		3120 J	465 J	2460 J	2190 J
MANGANESE	180	435 J	121 J	250 J	205 J
NICKEL	160	23.7 J	1.7 J	13.9 J	12.3 J
POTASSIUM		510 J	456 J	434 J	414 J
SELENIUM	39	4.8 J	0.90 UJ	3.7 J	2.6 J
SILVER	39	0.018 UJ	0.018 UJ	0.018 UJ	0.019 UJ
SODIUM		55.8	33.8	93.3	95.6
THALLIUM	0.52	R	1.8 J	3.1 J	3.2 J
VANADIUM	55	16.2 J	3.9 J	18.1 J	16.2 J
ZINC	2300	54.8 J	20.8 J	50.9 J	29.4 J
METALS BY METHOD 7471A (MG/KG)					
MERCURY	2.3	0.0081 J	0.0072 U	0.031	0.0070 U

(1) EPA Region IX PRGs for residential use soils adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified.
(2) Rhode Island Direct Exposure Criteria for Residential Soils.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D2

SUMMARY OF ANALYTICAL RESULTS - GROUNDWATER
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05
	SAMPLE NUMBER	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05-D
	SAMPLE DATE	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05
	QC IDENTIFIER						Field Dup.	Field Dup.
	DUPLICATE							SWOS-A-MW05
PARAMETER	**PAL [1]**							
VOLATILES BY METHOD 8260B (UG/L)								
1,1,1-TRICHLOROETHANE	320	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-TETRACHLOROETHANE	0.055	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROETHANE	0.2	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-TRICHLOROTRIFLUOROETHANE	5900	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHANE	81	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-DICHLOROETHENE	7[2]	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
1,2,4-TRICHLOROBENZENE	19	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DIBROMO-3-CHLOROPROPANE	0.048	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DIBROMOETHANE	0.00076	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROBENZENE	37	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROETHANE	0.12	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-DICHLOROPROPANE	0.16	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-DICHLOROBENZENE	0.55	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-DICHLOROBENZENE	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-BUTANONE	190	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U
2-HEXANONE		5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-METHYL-2-PENTANONE	16	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ACETONE	61	5 UJ	420 J	5 UJ	5 UJ	5 UJ	130 J	130 J
BENZENE	0.34	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
BROMODICHLOROMETHANE	0.18	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
BROMOFORM	8.5	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
BROMOMETHANE	0.87	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CARBON DISULFIDE	100	0.5 U	2.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CARBON TETRACHLORIDE	0.17	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROBENZENE	11	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLORODIBROMOMETHANE	0.13	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROETHANE	4.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CHLOROFORM	0.62	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
CHLOROMETHANE	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,2-DICHLOROETHENE	6.1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CIS-1,3-DICHLOROPROPENE		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
CYCLOHEXANE	3500	0.5 U	0.5 U	0.5 U	0.5 U	0.36 J	0.5 U	0.5 U
DICHLORODIFLUOROMETHANE	39	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ETHYLBENZENE	2.9	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ISOPROPYLBENZENE	66	0.5 U	0.5 U	0.5 U	0.5 U	1.2	0.5 U	0.5 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D2

SUMMARY OF ANALYTICAL RESULTS - GROUNDWATER
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05
	SAMPLE NUMBER	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05-D
	SAMPLE DATE	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05
	QC IDENTIFIER						Field Dup.	Field Dup.
	DUPLICATE							SWOS-A-MW05
PARAMETER	**PAL [(1)]**							
METHYL ACETATE	610	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
METHYL TERT-BUTYL ETHER	13	0.5 U	1	0.53	0.5 U	0.36 J	0.5 U	0.5 U
METHYLENE CHLORIDE	4.3	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
O-XYLENE		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
P-XYLENE		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
STYRENE	160	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TETRACHLOROETHENE	0.66	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOLUENE	72	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOTAL XYLENES	21	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRANS-1,2-DICHLOROETHENE	12	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
TRANS-1,3-DICHLOROPROPENE		0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
TRICHLOROETHENE	0.028	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TRICHLOROFLUOROMETHANE	130	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VINYL CHLORIDE	0.02	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
SEMIVOLATILES BY METHOD 8270C (UG/L)								
1,1-BIPHENYL	30	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.27	10 U	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ
2,4,5-TRICHLOROPHENOL	360	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2,4,6-TRICHLOROPHENOL	0.36	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DICHLOROPHENOL	11	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	73	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-DINITROPHENOL	7.3	20 U	20 U	20 U	20 UJ	20 UJ	20 U	20 UJ
2,4-DINITROTOLUENE	7.3	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,6-DINITROTOLUENE	3.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-CHLORONAPHTHALENE	49	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-CHLOROPHENOL	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-METHYLNAPHTHALENE		10 U	2 J	10 U	10 U	5 J	10 U	10 U
2-METHYLPHENOL	180	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-NITROANILINE	0.1	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2-NITROPHENOL		10 U	10 U	10 U	10 U	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	0.15	10 U	10 U	10 U	10 U	10 R	10 U	10 U
3-NITROANILINE		20 U	20 U	20 U	20 UJ	20 UJ	20 U	20 UJ
4,6-DINITRO-2-METHYLPHENOL		20 U	20 U	20 U	20 U	20 U	20 U	20 U
4-BROMOPHENYL PHENYL ETHER		10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL		10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-CHLOROANILINE	15	10 U	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D2

SUMMARY OF ANALYTICAL RESULTS - GROUNDWATER
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05
	SAMPLE NUMBER	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05-D
	SAMPLE DATE	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05
	QC IDENTIFIER						Field Dup.	Field Dup.
	DUPLICATE							SWOS-A-MW05
PARAMETER	**PAL (1)**							
4-CHLOROPHENYL PHENYL ETHER		10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-METHYLPHENOL	18	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-NITROANILINE		20 U	20 U	20 U	20 UJ	20 UJ	20 U	20 UJ
4-NITROPHENOL	29	20 U	20 U	20 U	20 U	20 U	20 U	20 U
ACENAPHTHENE	36	10 U	10 U	10 U	10 U	1 J	4 J	2 J
ACENAPHTHYLENE		10 U	10 U	10 U	10 U	10 U	1 J	1 J
ACETOPHENONE		10 U	10 U	10 U	10 U	10 U	10 U	10 U
ANTHRACENE	180	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ATRAZINE	0.3	10 U	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ
BENZALDEHYDE	360	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(A)ANTHRACENE	0.092	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(A)PYRENE	0.0092	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(B)FLUORANTHENE	0.092	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(G,H,I)PERYLENE		10 U	10 U	10 U	10 U	10 U	10 U	10 U
BENZO(K)FLUORANTHENE	0.92	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHOXY)METHANE		10 U	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	0.0098	10 U	10 U	10 U	10 U	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	10 U	3 J	10 U	10 U	10 U	10 U	10 U
BUTYL BENZYL PHTHALATE	730	10 U	10 U	10 U	10 U	10 U	10 U	10 U
CAPROLACTAM	1800	59	10 U	10 U	27	14	23	19
CARBAZOLE	3.4	10 U	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ
CHRYSENE	9.2	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	0.0092	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DIBENZOFURAN	2.4	10 U	10 U	10 U	10 U	1 J	3 J	2 J
DIETHYL PHTHALATE	2900	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DIMETHYL PHTHALATE	36000	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DI-N-BUTYL PHTHALATE	360	10 U	10 U	10 U	10 U	10 U	10 U	10 U
DI-N-OCTYL PHTHALATE	150	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FLUORANTHENE	150	10 U	10 U	10 U	10 U	10 U	10 U	10 U
FLUORENE	24	10 U	10 U	10 U	10 U	1 J	5 J	4 J
HEXACHLOROBENZENE	0.042	10 U	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROBUTADIENE	0.86	10 U	10 U	10 U	10 U	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	22	10 U	10 U	10 U	10 UJ	10 UJ	10 U	10 UJ
HEXACHLOROETHANE	4.8	10 U	10 U	10 U	10 U	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	0.092	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ISOPHORONE	71	10 U	10 U	10 U	10 U	10 U	10 U	10 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D2

SUMMARY OF ANALYTICAL RESULTS - GROUNDWATER
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05
	SAMPLE NUMBER	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05-D
	SAMPLE DATE	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05
	QC IDENTIFIER						Field Dup.	Field Dup.
	DUPLICATE							SWOS-A-MW05
PARAMETER	**PAL (1)**							
NAPHTHALENE	0.62	10 U	10 U	10 U	10 U	2 J	10 U	10 U
NITROBENZENE	0.34	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	0.0096	10 U	10 U	10 U	10 U	10 U	10 U	10 U
N-NITROSODIPHENYLAMINE	14	10 U	10 U	10 U	10 U	10 U	10 U	10 U
PENTACHLOROPHENOL	0.56	20 U	20 U	20 U	20 U	20 U	20 U	20 U
PHENANTHRENE		10 U	10 U	10 U	10 U	10 U	10 U	10 U
PHENOL	2200	10 U	10 U	10 U	10 U	10 U	10 U	10 U
PYRENE	18	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total PAHs								
PETROLEUM HYDROCARBONS BY METHOD GRO_W (MG/L)								
GASOLINE RANGE ORGANICS		0.050 U	0.050 U	0.050 U	0.050 U	0.110	0.120	0.110
PETROLEUM HYDROCARBONS BY METHOD TPH_W (MG/L)								
DIESEL RANGE ORGANICS		0.35 U	0.36	0.35 U	0.35 U	0.92	0.85	0.8
PESTICIDES/PCBS BY METHOD 8081A (UG/L)								
4,4'-DDD	0.28	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDE	0.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4,4'-DDT	0.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ALDRIN	0.004	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
ALPHA-BHC	0.011	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
ALPHA-CHLORDANE	0.19	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
BETA-BHC	0.037	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
DELTA-BHC		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
DIELDRIN	0.0042	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ENDOSULFAN I		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
ENDOSULFAN II	22	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ENDOSULFAN SULFATE		0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN	1.1	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
ENDRIN ALDEHYDE		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
ENDRIN KETONE		0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ	0.1 UJ
GAMMA-BHC (LINDANE)	0.052	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
GAMMA-CHLORDANE	0.19	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
HEPTACHLOR	0.015	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
HEPTACHLOR EPOXIDE	0.0074	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
METHOXYCHLOR	18	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TOXAPHENE	0.061	5 U	5 U	5 U	5 U	5 U	5 U	5 U

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

APPENDIX D2

SUMMARY OF ANALYTICAL RESULTS - GROUNDWATER
SURFACE WARFARE OFFICERS SCHOOL
NAVAL STATION NEWPORT, NEWPORT, RHODE ISLAND

	SAMPLE LOCATION	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05
	SAMPLE NUMBER	OFF-A-MW05	SWOS-A-MW01	SWOS-A-MW02	SWOS-A-MW03	SWOS-A-MW04	SWOS-A-MW05	SWOS-A-MW05-D
	SAMPLE DATE	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05	03/28/05
	QC IDENTIFIER						Field Dup.	Field Dup.
	DUPLICATE							SWOS-A-MW05
PARAMETER	**PAL (1)**							
PESTICIDES/PCBS BY METHOD 8082 (UG/L)								
AROCLOR-1016	0.96	1 U	1 U	1 U	1 U	1 U	1 U	1 U
AROCLOR-1221	0.034	1 U	1 U	1 U	1 U	1 U	1 U	1 U
AROCLOR-1232	0.034	1 U	1 U	1 U	1 U	1 U	1 U	1 U
AROCLOR-1242	0.034	1 U	1 U	1 U	1 U	1 U	1 U	1 U
AROCLOR-1248	0.034	1 U	1 U	1 U	1 U	1 U	1 U	1 U
AROCLOR-1254	0.034	1 U	1 U	1 U	1 U	1 U	1 U	1 U
AROCLOR-1260	0.034	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METALS BY METHOD SW6010B_W (UG/L)								
ALUMINUM	3600	48.7 U	4990	107	145	380	155	156
ANTIMONY	1.5	2.9 U	3.8 U	1.2 U	NA	5.5 U	4.0 U	2.3 UJ
ARSENIC	0.045	1.6 U	5.1 U	1.8 UJ	2.6 UJ	2.6 UJ	3.1 UJ	2.9 UJ
BARIUM	260	10	36.5	18.1	36.6	90.6	15.7	15.4
BERYLLIUM	7.3	0.15 U	0.19 J	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U
CADMIUM	1.8	0.59 U	0.10 U	0.19 UJ	NA	0.18 UJ	0.10 U	0.17 UJ
CALCIUM		83300	9840	14100	61900	NA	17500	NA
CHROMIUM	100(3)	NA	10.7	0.75 UJ	0.80 U	0.76 U	0.38 U	0.38 U
COBALT	73	0.15 U	4.6	10.3	1.7	2.9	2.1	NA
COPPER	150	6.3 U	22.5 U	7.1 UJ	9.7 UJ	9.3 UJ	6.4 UJ	6.6 UJ
IRON	1100	272 U	8820	292 U	2280 U	8090	3600	4820
LEAD	15(3)	NA	8.7	0.46 U	0.76 UJ	3.1 U	0.85 UJ	1.2 U
MAGNESIUM		20800	1820	11400	12700	12400	7770	7480
MANGANESE	88	313	151	1470	646	2740	1900	1830
NICKEL	73	3.0	9.7	10.4	2.1	19.5 B	12.3	11.8
POTASSIUM		5800	9910	5130	5090	5840	3910	3830
SELENIUM	18	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U	0.98 U
SILVER	18	0.91 U	NA	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
SODIUM		32900	9620	77200	73600	60100	56900	54900
THALLIUM	0.24	2.6 U	NA	5.5 U	3.0 U	9.3 U	8.0 U	7.0 U
VANADIUM	26	0.47 U	8.1	0.47 U	0.47 U	1.0 U	0.57 UJ	0.63 UJ
ZINC	1100	40.0 U	33.5 U	13.7 U	11.7 U	30.3 U	10.1 U	12.3 U
METALS BY METHOD SW7470A (UG/L)								
MERCURY	1.1	0.060 U	0.063 U	0.060 U	0.061 U	0.059 U	0.065 U	0.062 U

(1) EPA Region IX PRGs for Tap Water adjusted to reflect a hazard quotient of 0.1 for noncarcinogenic contaminants, unless otherwise specified..

(2) Rhode Island GB Groundwater Objectives.

(3) Federal Maximum Contaminant Lebel for drinking water.

GREY BACKGROUND - DETECTED; BLACK BACKGROUND - CRITERIA EXCEEDED; J - ESTIMATED;
NA - NOT ANALYZED; R - NOT USABLE; U - NOT DETECTED; UJ - NOT DETECTED AND ESTIMATED

MITKEM CORPORATION

"Environmental Testing For The New Millennium"

May 11, 2005

Tetra Tech NUS, Inc.
55 Jonspin Road
Wilmington, MA 01887
Attn: Ms. Lucy Guzman

RE: Client Project: CTO-25, Newport, N5339-0540, NAPL Sample
Lab Project #: D0405

Dear Ms. Guzman:

Enclosed please find the hardcopy and CD-ROM data report of the required analyses for the samples associated with the above referenced project.

If you have any questions regarding this report, please call me.

We appreciate your business.

Sincerely,

Edward A. Lawler
Laboratory Operations Manger

175 Metro Center Boulevard • Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499 • www.mitkem.com

MITKEM CORPORATION

* Data Summary Pack *

Analytical Data Package for Tetra Tech NUS, Inc.

Client Project: CTO-25, Newport, N5339-0540, NAPL Sample

SDG# MD0405

Mitkem Work Order ID: D0405

May 11, 2005

Prepared For:

Tetra Tech NUS, Inc.
55 Jonspin Road
Wilmington, MA 01887
Attn: Ms. Lucy Guzman

Prepared By:

Mitkem Corporation
175 Metro Center Boulevard
Warwick, RI 02886
(401) 732-3400

SDG Narrative

Mitkem Corporation submits the enclosed data package in response to Tetra Tech NUS Inc.'s CTO-25, Newport, N5339-0540 project. Under this deliverable, analysis results are presented for one non-aqueous phase liquid sample that was received at Mitkem on April 6, 2005 and logged in under Mitkem Work Order Number D0405. Analyses were performed per specifications in the chain of custody form following discussions with the client. Due to limitations in CLP data reporting software, client sample IDs were shortened. A table of full ID, shortened ID and laboratory ID follows this narrative.

The analyses were performed according to EPA SW-846 protocols and reported in a CLP-type format for Level 4 deliverable. Results for fuel identification (TPH-type analysis) are reported in the standard Mitkem format with all supporting raw data.

The following observation and/or deviations are observed for the following analyses:

1. Overall Observation:

This sample was received in a single jar containing a relatively small amount of multi-phase liquid. Mitkem determined that the upper layer of the liquid was oil or organic, and the lower layer was water (or miscible with water). Per discussion with the client, the upper oil layer was analyzed, initially for PCB and volatile organic compounds. As these analyses failed to identify the oil source, a qualitative total petroleum hydrocarbons-type of analysis was performed to identify the fuel product.

Where needed, manual integrations were performed to improve data quality. The corrections were reviewed and associated hardcopies generated and reported as required. Manual integrations are coded to provide the data reviewer justification for such action. The codes are labeled on the ion chromatogram signal (GC/MS signal) and chromatogram for GC based analysis as follows:

- M1 peak tailing or fronting.
- M2 peak co-elution.
- M3 rising or falling baseline.
- M4 retention time shift.
- M5 miscellaneous – under this category, the justification is explained.

The enclosed report includes the originals of all data with the exception of logbook pages and certain initial calibrations. Photocopies of logbook pages are included, with the originals maintained on file at the laboratory. The originals of initial calibrations that are shared among several cases are maintained on file at the laboratory, with photocopies included in the data package.

2. Volatile Analysis:

A 0.5 gram portion of the upper oil layer was diluted in 5 mL of methanol. A 10 uL aliquot of the methanol was diluted in 40 mL of water, and a 5 mL aliquot of this was purged and analyzed using Method 8260. The 10 uL to 40 mL ratio is expressed on the data report forms as 1.25 (rounded to 1.3) uL soil aliquot volume, and the 5 mL water purge is the default value. The analysis was performed with a batch of water samples. Most data report forms reference water method and QC limits. The sample results are presented on a medium-level soil Form 1 to reference the methanol dilution, and to report the results on a weight/volume basis.

Surrogate recovery: recoveries were within the QC limits.

Lab control sample: spike recoveries were within the QC limits in the LCS and duplicate LCS.

Sample analysis: the laboratory was particularly cautious to avoid potential overloading the instrument with organic matrix sample. A lower dilution was not performed to reduce the reporting limits. The sensitivity of the test was sufficient to rule-out gasoline as the major constituent of the oil layer in the sample. No other unusual observation was made for the analysis.

3. PCB Analysis:

A 0.3 gram aliquot of the oil layer was diluted into 5 mL of hexane, subjected to acid and sulfur clean-up and analyzed for PCBs.

Surrogate recovery: recoveries were within the QC limits for the sample, but above the upper QC limit for one surrogate on one GC column for the method blank and LCS/LCSD.

Lab control sample: spike recoveries were within the QC limits in the lab control sample and duplicate LCS.

Sample analysis: no unusual observation was made for the analysis.

4. Fuel Identification/Total Petroleum Hydrocarbons (TPH) Analysis:

Per discussion with the client, an aliquot of the methanol extract prepared for volatile organic analysis was analyzed by gas chromatography/flame ionization detection in an attempt to identify the oil source. This analysis performed should be considered qualitatively identifying the product, rather than quantitatively measuring its concentration.

This instrument is calibrated for Total Petroleum Hydrocarbons analysis, which includes extractable organics from C9 through C36. A copy of the continuing calibration verification standard is provided.

Sample analysis: the petroleum hydrocarbon patterns in the sample was identified by comparison to standards of common hydrocarbon fuels. Standards and samples were analyzed under identical conditions. This sample contained resolved and unresolved peaks in the retention time range for a typical Diesel Fuel. An overlay chromatogram is provided showing a comparison between the sample and a diesel fuel standard. The sample shows relatively fewer resolved peaks than the standard, which indicates that it is relatively more weathered than the diesel fuel standard. The internal standard peak has been identified on each chromatogram. No other unusual observation was made for the analysis.

All pages in this report have been numbered consecutively, starting with the title page and ending with a page saying only "Last Page of Data Report".

I certify that this data package is in compliance, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Edward A. Lawler
Laboratory Operations Manager
5/11/05

*Mitkem and Client Sample ID Summary Report**

Mitkem Workorder: D0405

Client Name: Tetra Tech NUS, Inc.

Mitkem Sample ID	*Reported Client Sample ID*	*Full Client Sample ID*
D0405-01A	SB18-1012	SWOS-A-SB18-1012

** If client sample ID has not been truncated, the full client sample ID is listed in the column labeled "Reported Client Sample ID"*

MITKEM CORPORATION

Analysis Report: Fuel Identification

Client: TETRA_TECH
Analysis: Method 8015M/8100M
Matrix: Soil
Extraction Date: 4/7/05

Lab ID	Client ID	Result	Analysis Date:
D0405-01A	SWOS-A-SB18-1012	see below	05/11/2005

Fuel Identification:

Sample D0405-01A, contains resolved and unresolved peaks in the retention time range for typical Diesel Fuel.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB18-1012

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) SOIL Lab Sample ID: D0405-01A

Sample wt/vol: 0.5 (g/mL) G Lab File ID: V2G7824

Level: (low/med) MED Date Received: 04/06/05

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5(mL) Soil Aliquot Volume: 1.3(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	200000	U
74-87-3	Chloromethane	200000	U
75-01-4	Vinyl Chloride	200000	U
74-83-9	Bromomethane	200000	U
75-00-3	Chloroethane	200000	U
75-69-4	Trichlorofluoromethane	200000	U
75-35-4	1,1-Dichloroethene	200000	U
67-64-1	Acetone	200000	U
75-15-0	Carbon Disulfide	200000	U
75-09-2	Methylene Chloride	200000	U
156-60-5	trans-1,2-Dichloroethene	200000	U
1634-04-4	Methyl tert-butyl ether	200000	U
75-34-3	1,1-Dichloroethane	200000	U
78-93-3	2-Butanone	200000	U
156-59-2	cis-1,2-Dichloroethene	200000	U
67-66-3	Chloroform	200000	U
71-55-6	1,1,1-Trichloroethane	200000	U
56-23-5	Carbon Tetrachloride	200000	U
107-06-2	1,2-Dichloroethane	200000	U
71-43-2	Benzene	200000	U
79-01-6	Trichloroethene	200000	U
78-87-5	1,2-Dichloropropane	200000	U
75-27-4	Bromodichloromethane	200000	U
10061-01-5	cis-1,3-Dichloropropene	200000	U
108-10-1	4-Methyl-2-pentanone	200000	U
108-88-3	Toluene	200000	U
10061-02-6	trans-1,3-Dichloropropene	200000	U
79-00-5	1,1,2-Trichloroethane	200000	U
127-18-4	Tetrachloroethene	200000	U
591-78-6	2-Hexanone	200000	U
124-48-1	Dibromochloromethane	200000	U
106-93-4	1,2-Dibromoethane	200000	U
108-90-7	Chlorobenzene	200000	U
100-41-4	Ethylbenzene	200000	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB18-1012

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) SOIL Lab Sample ID: D0405-01A

Sample wt/vol: 0.5 (g/mL) G Lab File ID: V2G7824

Level: (low/med) MED Date Received: 04/06/05

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5(mL) Soil Aliquot Volume: 1.3(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
	m,p-Xylene	200000	U
95-47-6	o-Xylene	200000	U
1330-20-7	Xylene (Total)	200000	U
100-42-5	Styrene	200000	U
75-25-2	Bromoform	200000	U
98-82-8	Isopropylbenzene	200000	U
79-34-5	1,1,2,2-Tetrachloroethane	200000	U
541-73-1	1,3-Dichlorobenzene	200000	U
106-46-7	1,4-Dichlorobenzene	200000	U
95-50-1	1,2-Dichlorobenzene	200000	U
96-12-8	1,2-Dibromo-3-chloropropane	200000	U
120-82-1	1,2,4-Trichlorobenzene	200000	U
76-13-1	1,1,2-Trichloro-1,2,2-triflu	200000	U
79-20-9	Methyl Acetate	200000	U
110-81-7	Cyclohexane	200000	U
108-87-2	Methylcyclohexane	200000	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB18-1012

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) WATER Lab Sample ID: D0405-01A

Sample wt/vol: 0.5.000 (g/mL) ~~MT~~ Lab File ID: V2G7824

Level: (low/med) LOW Date Received: 04/06/05

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5mL (uL) Soil Aliquot Volume: 1.3 (uL)

Number TICs found: 0

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/~~L~~ Kg.

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
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30.				

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

V2GLCS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) WATER Lab Sample ID: LCS-17556

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V2G7804

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	44	
74-87-3	Chloromethane	40	
75-01-4	Vinyl Chloride	40	
74-83-9	Bromomethane	56	
75-00-3	Chloroethane	48	
75-69-4	Trichlorofluoromethane	63	
75-35-4	1,1-Dichloroethene	53	
67-64-1	Acetone	64	
75-15-0	Carbon Disulfide	50	
75-09-2	Methylene Chloride	52	
156-60-5	trans-1,2-Dichloroethene	49	
1634-04-4	Methyl tert-butyl ether	47	
75-34-3	1,1-Dichloroethane	45	
78-93-3	2-Butanone	47	
156-59-2	cis-1,2-Dichloroethene	45	
67-66-3	Chloroform	53	
71-55-6	1,1,1-Trichloroethane	54	
56-23-5	Carbon Tetrachloride	55	
107-06-2	1,2-Dichloroethane	52	
71-43-2	Benzene	48	
79-01-6	Trichloroethene	47	
78-87-5	1,2-Dichloropropane	45	
75-27-4	Bromodichloromethane	51	
10061-01-5	cis-1,3-Dichloropropene	45	
108-10-1	4-Methyl-2-pentanone	45	
108-88-3	Toluene	48	
10061-02-6	trans-1,3-Dichloropropene	47	
79-00-5	1,1,2-Trichloroethane	48	
127-18-4	Tetrachloroethene	51	
591-78-6	2-Hexanone	50	
124-48-1	Dibromochloromethane	52	
106-93-4	1,2-Dibromoethane	47	
108-90-7	Chlorobenzene	47	
100-41-4	Ethylbenzene	47	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

V2GLCS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) WATER Lab Sample ID: LCS-17556

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V2G7804

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
----------	m,p-Xylene	99	
95-47-6	o-Xylene	50	
1330-20-7	Xylene (Total)	150	
100-42-5	Styrene	50	
75-25-2	Bromoform	56	
98-82-8	Isopropylbenzene	52	
79-34-5	1,1,2,2-Tetrachloroethane	46	
541-73-1	1,3-Dichlorobenzene	46	
106-46-7	1,4-Dichlorobenzene	47	
95-50-1	1,2-Dichlorobenzene	48	
96-12-8	1,2-Dibromo-3-chloropropane	51	
120-82-1	1,2,4-Trichlorobenzene	44	
76-13-1	1,1,2-Trichloro-1,2,2-triflu	55	
79-20-9	Methyl Acetate	58	
110-81-7	Cyclohexane	41	
108-87-2	Methylcyclohexane	45	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

V2GLCSD

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) WATER Lab Sample ID: LCSD-17556

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V2G7805

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	47	
74-87-3	Chloromethane	42	
75-01-4	Vinyl Chloride	45	
74-83-9	Bromomethane	55	
75-00-3	Chloroethane	51	
75-69-4	Trichlorofluoromethane	61	
75-35-4	1,1-Dichloroethene	54	
67-64-1	Acetone	62	
75-15-0	Carbon Disulfide	50	
75-09-2	Methylene Chloride	52	
156-60-5	trans-1,2-Dichloroethene	48	
1634-04-4	Methyl tert-butyl ether	49	
75-34-3	1,1-Dichloroethane	49	
78-93-3	2-Butanone	50	
156-59-2	cis-1,2-Dichloroethene	47	
67-66-3	Chloroform	54	
71-55-6	1,1,1-Trichloroethane	53	
56-23-5	Carbon Tetrachloride	55	
107-06-2	1,2-Dichloroethane	53	
71-43-2	Benzene	48	
79-01-6	Trichloroethene	48	
78-87-5	1,2-Dichloropropane	48	
75-27-4	Bromodichloromethane	54	
10061-01-5	cis-1,3-Dichloropropene	46	
108-10-1	4-Methyl-2-pentanone	50	
108-88-3	Toluene	49	
10061-02-6	trans-1,3-Dichloropropene	51	
79-00-5	1,1,2-Trichloroethane	52	
127-18-4	Tetrachloroethene	51	
591-78-6	2-Hexanone	50	
124-48-1	Dibromochloromethane	52	
106-93-4	1,2-Dibromoethane	49	
108-90-7	Chlorobenzene	48	
100-41-4	Ethylbenzene	47	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

V2GLCSD

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) WATER Lab Sample ID: LCSD-17556

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V2G7805

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
----------	m,p-Xylene	100	
95-47-6	o-Xylene	50	
1330-20-7	Xylene (Total)	150	
100-42-5	Styrene	51	
75-25-2	Bromoform	57	
98-82-8	Isopropylbenzene	50	
79-34-5	1,1,2,2-Tetrachloroethane	49	
541-73-1	1,3-Dichlorobenzene	46	
106-46-7	1,4-Dichlorobenzene	46	
95-50-1	1,2-Dichlorobenzene	48	
96-12-8	1,2-Dibromo-3-chloropropane	54	
120-82-1	1,2,4-Trichlorobenzene	44	
76-13-1	1,1,2-Trichloro-1,2,2-triflu	56	
79-20-9	Methyl Acetate	64	
110-81-7	Cyclohexane	44	
108-87-2	Methylcyclohexane	43	

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SB18-1012

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Matrix: (soil/water) OIL Lab Sample ID: D0405-01A

Sample wt/vol: 0.3 (g/mL) G Lab File ID: E3E8924F

% Moisture: 0 decanted: (Y/N) N Date Received: 04/06/05

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted: 04/29/05

Concentrated Extract Volume: 5000(uL) Date Analyzed: 04/29/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	1600	U
11104-28-2	Aroclor-1221	1600	U
11141-16-5	Aroclor-1232	1600	U
53469-21-9	Aroclor-1242	1600	U
12672-29-6	Aroclor-1248	1600	U
11097-69-1	Aroclor-1254	1600	U
11096-82-5	Aroclor-1260	1600	U

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

P3RLCS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Matrix: (soil/water) OIL Lab Sample ID: LCS-17898

Sample wt/vol: 0.5 (g/mL) G Lab File ID: E3E8922F

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted:04/29/05

Concentrated Extract Volume: 5000(uL) Date Analyzed: 04/29/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	11000	
11104-28-2	Aroclor-1221	990	U
11141-16-5	Aroclor-1232	990	U
53469-21-9	Aroclor-1242	990	U
12672-29-6	Aroclor-1248	990	U
11097-69-1	Aroclor-1254	990	U
11096-82-5	Aroclor-1260	12000	

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

P3RLCSD

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Matrix: (soil/water) OIL Lab Sample ID: LCSD-17898

Sample wt/vol: 0.5 (g/mL) G Lab File ID: E3E8923F

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted: 04/29/05

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 04/29/05

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	11000	
11104-28-2	Aroclor-1221	990	U
11141-16-5	Aroclor-1232	990	U
53469-21-9	Aroclor-1242	990	U
12672-29-6	Aroclor-1248	990	U
11097-69-1	Aroclor-1254	990	U
11096-82-5	Aroclor-1260	12000	

2A
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

	EPA SAMPLE NO.	SMC1 #	SMC2 (DCE) #	SMC3 (TOL) #	OTHER (BFB) #	TOT OUT
01	VBLK2G	109	95	100	99	0
02	V2GLCS	106	92	100	110	0
03	V2GLCSD	107	98	100	110	0
04	SB18-1012	108	94	102	96	0
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		QC LIMITS
SMC1	= Dibromofluoromethane	(78-117)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(62-124)
SMC3 (TOL)	= Toluene-d8	(81-116)
OTHER(BFB)	= Bromofluorobenzene	(74-126)

Column to be used to flag recovery values

* Values outside of contract required QC limits

FORM 2
OIL PCB SURROGATE RECOVERY

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

GC Column(1): DB-1707 ID: 0.53 (mm) GC Column(2): DB-608 ID: 0.53 (mm)

	CLIENT SAMPLE NO.	TCX 1 %REC #	TCX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #	OTHER (1)	OTHER (2)	TOT OUT
01	PBLK3R	158*	100	104	102			1
02	P3RLCS	154*	100	106	104			1
03	P3RLCSD	150*	100	105	102			1
04	SB18-1012	69	82	124	90			0
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ADVISORY
QC LIMITS

S1 (TCX) = Tetrachloro-m-xylene (42-147)
S2 (DCB) = Decachlorobiphenyl (29-155)

Column to be used to flag recovery values
* Values outside of QC limits
D Surrogate diluted out

FORM II PCB

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix Spike - Sample No.: V2GLCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	50		44	88	48-135
Chloromethane	50		40	80	60-118
Vinyl Chloride	50		40	80	65-113
Bromomethane	50		56	112	73-122
Chloroethane	50		48	96	72-118
Trichlorofluoromethane	50		63	126	68-129
1,1-Dichloroethene	50		53	106	67-121
Acetone	50		64	128	38-161
Carbon Disulfide	50		50	100	53-137
Methylene Chloride	50		52	104	59-132
trans-1,2-Dichloroethen	50		49	98	71-124
Methyl tert-butyl ether	50		47	94	75-123
1,1-Dichloroethane	50		45	90	83-116
2-Butanone	50		47	94	64-139
cis-1,2-Dichloroethene	50		45	90	83-120
Chloroform	50		53	106	89-118
1,1,1-Trichloroethane	50		54	108	81-122
Carbon Tetrachloride	50		55	110	79-125
1,2-Dichloroethane	50		52	104	83-123
Benzene	50		48	96	81-120
Trichloroethene	50		47	94	77-121
1,2-Dichloropropane	50		45	90	81-116
Bromodichloromethane	50		51	102	90-114
cis-1,3-Dichloropropene	50		45	90	78-119
4-Methyl-2-pentanone	50		45	90	57-138
Toluene	50		48	96	81-121
trans-1,3-Dichloroprope	50		47	94	85-118
1,1,2-Trichloroethane	50		48	96	44-159

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix Spike - Sample No.: V2GLCS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Tetrachloroethene	50		51	102	73-121
2-Hexanone	50		50	100	53-145
Dibromochloromethane	50		52	104	80-124
1,2-Dibromoethane	50		47	94	80-124
Chlorobenzene	50		47	94	82-118
Ethylbenzene	50		47	94	80-122
Xylene (Total)	150		150	100	81-121
Styrene	50		50	100	77-128
Bromoform	50		56	112	77-130
Isopropylbenzene	50		52	104	58-148
1,1,2,2-Tetrachloroetha	50		46	92	76-125
1,3-Dichlorobenzene	50		46	92	80-116
1,4-Dichlorobenzene	50		47	94	80-114
1,2-Dichlorobenzene	50		48	96	81-116
1,2-Dibromo-3-chloropro	50		51	102	71-126
1,2,4-Trichlorobenzene	50		44	88	67-114
Methyl Acetate	50		58	116	70-130
Cyclohexane	50		41	82	70-130
Methylcyclohexane	50		45	90	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix Spike - Sample No.: V2GLCS

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	50	47	94	6	40	48-135
Chloromethane	50	42	84	5	40	60-118
Vinyl Chloride	50	45	90	12	40	65-113
Bromomethane	50	55	110	2	40	73-122
Chloroethane	50	51	102	6	40	72-118
Trichlorofluoromethane	50	61	122	3	40	68-129
1,1-Dichloroethene	50	54	108	2	40	67-121
Acetone	50	62	124	3	40	38-161
Carbon Disulfide	50	50	100	0	40	53-137
Methylene Chloride	50	52	104	0	40	59-132
trans-1,2-Dichloroethen	50	48	96	2	40	71-124
Methyl tert-butyl ether	50	49	98	4	40	75-123
1,1-Dichloroethane	50	49	98	8	40	83-116
2-Butanone	50	50	100	6	40	64-139
cis-1,2-Dichloroethene	50	47	94	4	40	83-120
Chloroform	50	54	108	2	40	89-118
1,1,1-Trichloroethane	50	53	106	2	40	81-122
Carbon Tetrachloride	50	55	110	0	40	79-125
1,2-Dichloroethane	50	53	106	2	40	83-123
Benzene	50	48	96	0	40	81-120
Trichloroethene	50	48	96	2	40	77-121
1,2-Dichloropropane	50	48	96	6	40	81-116
Bromodichloromethane	50	54	108	6	40	90-114
cis-1,3-Dichloropropene	50	46	92	2	40	78-119
4-Methyl-2-pentanone	50	50	100	10	40	57-138
Toluene	50	49	98	2	40	81-121
trans-1,3-Dichloroprope	50	51	102	8	40	85-118
1,1,2-Trichloroethane	50	52	104	8	40	44-159

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

COMMENTS: _____

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix Spike - Sample No.: V2GLCS

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Tetrachloroethene	50	51	102	0	40	73-121
2-Hexanone	50	50	100	0	40	53-145
Dibromochloromethane	50	52	104	0	40	80-124
1,2-Dibromoethane	50	49	98	4	40	80-124
Chlorobenzene	50	48	96	2	40	82-118
Ethylbenzene	50	47	94	0	40	80-122
Xylene (Total)	150	150	100	0	40	81-121
Styrene	50	51	102	2	40	77-128
Bromoform	50	57	114	2	40	77-130
Isopropylbenzene	50	50	100	4	40	58-148
1,1,2,2-Tetrachloroetha	50	49	98	6	40	76-125
1,3-Dichlorobenzene	50	46	92	0	40	80-116
1,4-Dichlorobenzene	50	46	92	2	40	80-114
1,2-Dichlorobenzene	50	48	96	0	40	81-116
1,2-Dibromo-3-chloropro	50	54	108	6	40	71-126
1,2,4-Trichlorobenzene	50	44	88	0	40	67-114
Methyl Acetate	50	64	128	10	40	70-130
Cyclohexane	50	44	88	7	40	70-130
Methylcyclohexane	50	43	86	4	40	70-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 47 outside limits
Spike Recovery: 0 out of 94 outside limits

COMMENTS: _____

FORM 3
OIL PCB LAB CONTROL SAMPLE

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Matrix Spike - Sample No.: P3RLCS

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC. LIMITS REC.
Aroclor-1016	10000		11000	110	69-117
Aroclor-1260	10000		12000	120	68-126

COMPOUND	SPIKE ADDED (ug/Kg)	LCSD CONCENTRATION (ug/Kg)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Aroclor-1016	10000	11000	110	0	40	69-117
Aroclor-1260	10000	12000	120	0	40	68-126

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 2 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

FORM III PCB

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK2G

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Lab File ID: V2G7803 Lab Sample ID: MB-17556

Date Analyzed: 04/07/05 Time Analyzed: 1225

GC Column: DB-624 ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: V2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V2GLCS	LCS-17556	V2G7804	1302
02	V2GLCSD	LCSD-17556	V2G7805	1327
03	SB18-1012	D0405-01A	V2G7824	2211
04				
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COMMENTS:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK2G

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) WATER Lab Sample ID: MB-17556

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V2G7803

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
78-93-3	2-Butanone	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	1	J
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK2G

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) WATER Lab Sample ID: MB-17556

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V2G7803

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
----------	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
76-13-1	1,1,2-Trichloro-1,2,2-Triflu	5	U
79-20-9	Methyl Acetate	5	U
110-81-7	Cyclohexane	5	U
108-87-2	Methylcyclohexane	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK2G

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Matrix: (soil/water) WATER Lab Sample ID: MB-17556

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V2G7803

Level: (low/med) LOW Date Received: _____

% Moisture: not dec. _____ Date Analyzed: 04/07/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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30.				

FORM 4
PCB METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

PBLK3R

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Lab Sample ID: MB-17898 Lab File ID: E3E8921F

Matrix (soil/water) OIL Extraction: (SepF/Cont/Sonc) OTHER

Sulfur Cleanup (Y/N) Y Date Extracted: 04/29/05

Date Analyzed (1): 04/29/05 Date Analyzed (2): 04/29/05

Time Analyzed (1): 1708 Time Analyzed (2): 1708

Instrument ID (1): E3 Instrument ID (2): E3

GC Column (1): DB-1707 ID: 0.53(mm) GC Column (2): DB-608 ID: 0.53(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
01	P3RLCS	LCS-17898	04/29/05	04/29/05
02	P3RLCSD	LCSD-17898	04/29/05	04/29/05
03	SB18-1012	D0405-01A	04/29/05	04/29/05
04				
05				
06				
07				
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COMMENTS:

FORM IV PCB

FORM 1
PCB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

PBLK3R

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Matrix: (soil/water) OIL Lab Sample ID: MB-17898

Sample wt/vol: 0.5 (g/mL) G Lab File ID: E3E8921F

% Moisture: 0 decanted: (Y/N) N Date Received: _____

Extraction: (SepF/Cont/Sonc) OTHER Date Extracted: 04/29/05

Concentrated Extract Volume: 5000 (uL) Date Analyzed: 04/29/05

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___ Sulfur Cleanup: (Y/N) Y

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
12674-11-2	Aroclor-1016	990	U
11104-28-2	Aroclor-1221	990	U
11141-16-5	Aroclor-1232	990	U
53469-21-9	Aroclor-1242	990	U
12672-29-6	Aroclor-1248	990	U
11097-69-1	Aroclor-1254	990	U
11096-82-5	Aroclor-1260	990	U

FORM I PCB

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Lab File ID (Standard): V2G7801 Date Analyzed: 04/07/05

Instrument ID: V2 Time Analyzed: 1051

GC Column: DB-624 ID: 0.25 (mm) Heated Purge: (Y/N) N

		IS1 AREA #	RT #	IS2(CBZ) AREA #	RT #	IS3(DCB) AREA #	RT #
	12 HOUR STD	1060757	6.60	702760	10.32	384981	13.19
	UPPER LIMIT	2121514	7.10	1405520	10.82	769962	13.69
	LOWER LIMIT	530379	6.10	351380	9.82	192491	12.69
	EPA SAMPLE NO.						
01	VBLK2G	1130660	6.61	758918	10.32	333024	13.19
02	V2GLCS	1061551	6.61	695754	10.32	379247	13.19
03	V2GLCSD	1043930	6.61	700981	10.32	369699	13.19
04	SB18-1012	1116230	6.61	746074	10.33	347471	13.20
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22							

IS1 = Fluorobenzene
IS2 (CBZ) = Chlorobenzene-d5
IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = - 50% of internal standard area
RT UPPER LIMIT = + 0.50 minutes of internal standard RT
RT LOWER LIMIT = - 0.50 minutes of internal standard RT

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

FORM 8
PCB ANALYTICAL SEQUENCE

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

GC Column: DB-1707 ID: 0.53 (mm) Init. Calib. Date(s): 04/21/05 04/22/05

Instrument ID: E3

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
TCX: 8.57 DCB: 21.22

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TCX RT #	DCB RT #
01	AR1221EL3	AR1221EL3	04/21/05	1916	8.57	21.23
02	AR1232EL3	AR1232EL3	04/21/05	1943	8.57	21.23
03	AR1242EL1	AR1242EL1	04/21/05	2009	8.57	21.23
04	AR1242EL2	AR1242EL2	04/21/05	2035	8.57	21.23
05	AR1242EL3	AR1242EL3	04/21/05	2102	8.57	21.23
06	AR1242EL4	AR1242EL4	04/21/05	2128	8.57	21.23
07	AR1242EL5	AR1242EL5	04/21/05	2154	8.57	21.22
08	AR1248EL1	AR1248EL1	04/21/05	2221	8.56	21.22
09	AR1248EL2	AR1248EL2	04/21/05	2247	8.56	21.22
10	AR1248EL3	AR1248EL3	04/21/05	2313	8.57	21.22
11	AR1248EL4	AR1248EL4	04/21/05	2340	8.56	21.22
12	AR1248EL5	AR1248EL5	04/22/05	0006	8.56	21.22
13	AR1254EL5	AR1254EL1	04/22/05	0032	8.56	21.22
14	AR1254EL2	AR1254EL2	04/22/05	0059	8.56	21.22
15	AR1254EL3	AR1254EL3	04/22/05	0125	8.56	21.22
16	AR1254EL4	AR1254EL4	04/22/05	0151	8.56	21.22
17	AR1254EL5	AR1254EL5	04/22/05	0218	8.56	21.22
18	AR1660EL1	AR1660EL1	04/22/05	0244	8.56	21.22
19	AR1660EL2	AR1660EL2	04/22/05	0310	8.56	21.22
20	AR1660EL3	AR1660EL3	04/22/05	0337	8.56	21.22
21	AR1660EL4	AR1660EL4	04/22/05	0403	8.56	21.22
22	AR1660EL5	AR1660EL5	04/22/05	0429	8.57	21.22
23	AR1660ER	AR1660ER	04/29/05	1544	8.55	21.19
24	PBLK3R	MB-17898	04/29/05	1708	8.55	21.20
25	P3RLCS	LCS-17898	04/29/05	1734	8.55	21.20
26	P3RLCSD	LCSD-17898	04/29/05	1800	8.55	21.20
27	SB18-1012	D0405-01A	04/29/05	1827	8.57	21.20
28	AR1660ES	AR1660ES	04/29/05	2251	8.54	21.18
29						
30						
31						
32						

QC LIMITS
TCX = Tetrachloro-m-xylene (+/- 0.05 MINUTES)
DCB = Decachlorobiphenyl (+/- 0.10 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

FORM VIII PCB

FORM 8
PCB ANALYTICAL SEQUENCE

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

GC Column: DB-608 ID: 0.53 (mm) Init. Calib. Date(s): 04/21/05 04/22/05

Instrument ID: E3

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

MEAN SURROGATE RT FROM INITIAL CALIBRATION
TCX: 6.55 DCB: 18.08

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TCX RT #	DCB RT #
01	AR1221EL3	AR1221EL3	04/21/05	1916	6.55	18.08
02	AR1232EL3	AR1232EL3	04/21/05	1943	6.55	18.08
03	AR1242EL1	AR1242EL1	04/21/05	2009	6.55	18.08
04	AR1242EL2	AR1242EL2	04/21/05	2035	6.55	18.08
05	AR1242EL3	AR1242EL3	04/21/05	2102	6.55	18.08
06	AR1242EL4	AR1242EL4	04/21/05	2128	6.55	18.08
07	AR1242EL5	AR1242EL5	04/21/05	2154	6.55	18.08
08	AR1248EL1	AR1248EL1	04/21/05	2221	6.54	18.07
09	AR1248EL2	AR1248EL2	04/21/05	2247	6.54	18.08
10	AR1248EL3	AR1248EL3	04/21/05	2313	6.55	18.08
11	AR1248EL4	AR1248EL4	04/21/05	2340	6.55	18.08
12	AR1248EL5	AR1248EL5	04/22/05	0006	6.55	18.08
13	AR1254EL5	AR1254EL1	04/22/05	0032	6.55	18.07
14	AR1254EL2	AR1254EL2	04/22/05	0059	6.55	18.07
15	AR1254EL3	AR1254EL3	04/22/05	0125	6.55	18.07
16	AR1254EL4	AR1254EL4	04/22/05	0151	6.55	18.07
17	AR1254EL5	AR1254EL5	04/22/05	0218	6.55	18.08
18	AR1660EL1	AR1660EL1	04/22/05	0244	6.55	18.07
19	AR1660EL2	AR1660EL2	04/22/05	0310	6.55	18.07
20	AR1660EL3	AR1660EL3	04/22/05	0337	6.55	18.07
21	AR1660EL4	AR1660EL4	04/22/05	0403	6.55	18.08
22	AR1660EL5	AR1660EL5	04/22/05	0429	6.55	18.08
23	AR1660ER	AR1660ER	04/29/05	1544	6.54	18.07
24	PBLK3R	MB-17898	04/29/05	1708	6.54	18.07
25	P3RLCS	LCS-17898	04/29/05	1734	6.54	18.07
26	P3RLCSD	LCSD-17898	04/29/05	1800	6.54	18.07
27	SB18-1012	D0405-01A	04/29/05	1827	6.58	18.07
28	AR1660ES	AR1660ES	04/29/05	2251	6.53	18.06
29						
30						
31						
32						

QC LIMITS
TCX = Tetrachloro-m-xylene (+/- 0.05 MINUTES)
DCB = Decachlorobiphenyl (+/- 0.10 MINUTES)

Column used to flag retention time values with an asterisk.
* Values outside of QC limits.

FORM VIII PCB

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Lab File ID: V2G7700 BFB Injection Date: 04/04/05

Instrument ID: V2 BFB Injection Time: 1420

GC Column: DB-624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	21.9
75	30.0 - 60.0% of mass 95	51.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.1
173	Less than 2.0% of mass 174	0.3 (0.4)1
174	50.0 - 100.0% of mass 95	89.1
175	5.0 - 9.0% of mass 174	6.6 (7.5)1
176	95.0 - 101.0% of mass 174	88.4 (99.2)1
177	5.0 - 9.0% of mass 176	6.2 (7.0)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD0502C	VSTD0502C	V2G7701	04/04/05	1523
02	VSTD0052C	VSTD0052C	V2G7702	04/04/05	1554
03	VSTD2002C	VSTD2002C	V2G7703	04/04/05	1622
04	VSTD1002C	VSTD1002C	V2G7704	04/04/05	1649
05	VSTD0202C	VSTD0202C	V2G7705	04/04/05	1717
06					
07					
08					
09					
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12					
13					
14					
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16					
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22					

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Lab File ID: V2G7800 BFB Injection Date: 04/07/05

Instrument ID: V2 BFB Injection Time: 1023

GC Column: DB-624 ID: 0.25 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.7
75	30.0 - 60.0% of mass 95	53.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.3 (0.3)1
174	50.0 - 100.0% of mass 95	88.1
175	5.0 - 9.0% of mass 174	6.9 (7.8)1
176	95.0 - 101.0% of mass 174	85.7 (97.2)1
177	5.0 - 9.0% of mass 176	5.4 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD0502G	VSTD0502G	V2G7801	04/07/05	1051
02	VBLK2G	MB-17556	V2G7803	04/07/05	1225
03	V2GLCS	LCS-17556	V2G7804	04/07/05	1302
04	V2GLCSD	LCSD-17556	V2G7805	04/07/05	1327
05	SB18-1012	D0405-01A	V2G7824	04/07/05	2211
06					
07					
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6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Instrument ID: V2 Calibration Date(s): 04/04/05 04/04/05

Heated Purge: (Y/N) N Calibration Time(s): 1523 1717

GC Column: DB-624 ID: 0.25 (mm)

LAB FILE ID: RRF5 =V2G7702 RRF20 =V2G7705
RRF50 =V2G7701 RRF100=V2G7704 RRF200=V2G7703

COMPOUND	RRF5	RRF20	RRF50	RRF100	RRF200	$\overline{RRF}$	% RSD
Dichlorodifluoromethane	0.300	0.296	0.314	0.300	0.320	0.306	3.4
Chloromethane *	0.296	0.265	0.279	0.250	0.284	0.275	6.4*
Vinyl Chloride	0.300	0.286	0.293	0.285	0.284	0.290	2.3
Bromomethane	0.289	0.244	0.235	0.231	0.229	0.246	10.2
Chloroethane	0.182	0.161	0.158	0.165	0.163	0.166	5.7
Trichlorofluoromethane	0.602	0.598	0.614	0.532	0.560	0.581	5.9
1,1-Dichloroethene	0.273	0.287	0.280	0.287	0.289	0.283	2.4
Acetone	0.300	0.204	0.271	0.216	0.232	0.245	16.3
Carbon Disulfide	0.758	0.743	0.725	0.761	0.770	0.751	2.3
Methylene Chloride	0.387	0.360	0.344	0.352	0.356	0.360	4.5
trans-1,2-Dichloroethene	0.368	0.364	0.337	0.337	0.329	0.347	5.1
Methyl tert-butyl ether	1.039	0.966	0.928	0.946	0.952	0.966	4.4
1,1-Dichloroethane *	0.605	0.617	0.584	0.602	0.606	0.603	2.0*
2-Butanone	0.204	0.160	0.166	0.163	0.170	0.173	10.3
cis-1,2-Dichloroethene	0.389	0.342	0.341	0.341	0.341	0.351	6.0
Chloroform	0.733	0.642	0.634	0.666	0.671	0.669	5.8
1,1,1-Trichloroethane	0.615	0.602	0.564	0.594	0.606	0.596	3.2
Carbon Tetrachloride	0.513	0.534	0.537	0.554	0.568	0.541	3.9
1,2-Dichloroethane	0.695	0.665	0.642	0.663	0.672	0.667	2.9
Benzene	1.094	1.021	0.996	1.018	1.007	1.027	3.8
Trichloroethene	0.353	0.344	0.337	0.336	0.340	0.342	2.0
1,2-Dichloropropane	0.270	0.260	0.251	0.264	0.265	0.262	2.7
Bromodichloromethane	0.499	0.479	0.467	0.491	0.504	0.488	3.1
cis-1,3-Dichloropropene	0.530	0.479	0.478	0.496	0.512	0.499	4.4
4-Methyl-2-pentanone	0.266	0.238	0.234	0.262	0.274	0.255	6.9
Toluene	1.111	1.087	1.054	1.104	1.107	1.093	2.2
trans-1,3-Dichloropropene	0.501	0.492	0.491	0.506	0.529	0.504	3.0
1,1,2-Trichloroethane	0.283	0.275	0.265	0.275	0.274	0.274	2.4
Tetrachloroethene	0.381	0.389	0.358	0.374	0.378	0.376	3.0
2-Hexanone	0.163	0.170	0.244	0.271	0.301	0.230	26.6
Dibromochloromethane	0.597	0.581	0.540	0.563	0.595	0.575	4.1
1,2-Dibromoethane	0.536	0.491	0.480	0.490	0.508	0.501	4.4
Chlorobenzene *	1.244	1.134	1.094	1.132	1.125	1.146	5.0*
Ethylbenzene	0.559	0.557	0.537	0.547	0.551	0.550	1.6
m,p-Xylene	0.683	0.668	0.656	0.658	0.657	0.664	1.8
o-Xylene	0.636	0.678	0.636	0.657	0.660	0.653	2.7
Xylene (Total)	0.668	0.671	0.649	0.658	0.658	0.661	1.3

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Instrument ID: V2 Calibration Date(s): 04/04/05 04/04/05

Heated Purge: (Y/N) N Calibration Time(s): 1523 1717

GC Column: DB-624 ID: 0.25 (mm)

LAB FILE ID: RRF5 =V2G7702 RRF20 =V2G7705
RRF50 =V2G7701 RRF100=V2G7704 RRF200=V2G7703

COMPOUND	RRF5	RRF20	RRF50	RRF100	RRF200	$\overline{RRF}$	% RSD
Styrene	1.053	1.096	1.104	1.167	1.171	1.118	4.5
Bromoform *	0.323	0.384	0.377	0.407	0.432	0.385	10.5*
Isopropylbenzene	1.373	1.425	1.422	1.452	1.501	1.435	3.3
1,1,2,2-Tetrachloroethane *	1.136	1.032	1.005	0.980	0.972	1.025	6.5*
1,3-Dichlorobenzene	1.732	1.673	1.612	1.636	1.659	1.662	2.7
1,4-Dichlorobenzene	1.890	1.779	1.733	1.790	1.773	1.793	3.3
1,2-Dichlorobenzene	1.704	1.678	1.671	1.681	1.661	1.679	1.0
1,2-Dibromo-3-chloropropane	0.148	0.204	0.206	0.208	0.225	0.198	14.8
1,2,4-Trichlorobenzene	0.945	0.904	0.866	0.932	0.968	0.923	4.3
1,1,2-Trichloro-1,2,2-triflu	0.293	0.302	0.306	0.310	0.320	0.306	3.3
Methyl Acetate	0.196	0.188	0.208	0.214	0.222	0.206	6.6
Cyclohexane	0.310	0.324	0.297	0.323	0.336	0.318	4.7
Methylcyclohexane	0.253	0.267	0.254	0.271	0.282	0.265	4.6
Dibromofluoromethane	0.382	0.380	0.370	0.392	0.378	0.380	2.1
1,2-Dichloroethane-d4	0.081	0.074	0.073	0.074	0.071	0.075	5.2
Toluene-d8	1.357	1.290	1.300	1.345	1.287	1.316	2.5
Bromofluorobenzene	0.512	0.511	0.527	0.550	0.531	0.526	3.1

* Compounds with required minimum RRF and maximim %RSD values.
All other compounds must meet a minimim RRF of 0.010.

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Instrument ID: V2 Calibration Date: 04/07/05 Time: 1051

Lab File ID: V2G7801 Init. Calib. Date(s): 04/04/05 04/04/05

Heated Purge: (Y/N) N Init. Calib. Times: 1523 1717

GC Column: DB-624 ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D	
Dichlorodifluoromethane	0.306	0.286	0.01	6.5	20.0	
Chloromethane	0.275	0.223	0.1	18.9	20.0	
Vinyl Chloride	0.290	0.250	0.01	13.8	20.0	
Bromomethane	0.246	0.272	0.01	10.6	20.0	
Chloroethane	0.166	0.177	0.01	6.6	20.0	
Trichlorofluoromethane	0.581	0.824	0.01	41.8	20.0	<-
1,1-Dichloroethene	0.283	0.309	0.01	9.2	20.0	
Acetone	0.245	0.294	0.01	20.0	20.0	
Carbon Disulfide	0.751	0.800	0.01	6.5	20.0	
Methylene Chloride	0.360	0.386	0.01	7.2	20.0	
trans-1,2-Dichloroethene	0.347	0.352	0.01	1.4	20.0	
Methyl tert-butyl ether	0.966	0.920	0.01	4.8	20.0	
1,1-Dichloroethane	0.603	0.592	0.1	1.8	20.0	
2-Butanone	0.173	0.165	0.01	4.6	20.0	
cis-1,2-Dichloroethene	0.351	0.318	0.01	9.4	20.0	
Chloroform	0.669	0.734	0.01	9.7	20.0	
1,1,1-Trichloroethane	0.596	0.679	0.01	13.9	20.0	
Carbon Tetrachloride	0.541	0.611	0.01	12.9	20.0	
1,2-Dichloroethane	0.667	0.722	0.01	8.2	20.0	
Benzene	1.027	0.976	0.01	5.0	20.0	
Trichloroethene	0.342	0.311	0.01	9.1	20.0	
1,2-Dichloropropane	0.262	0.232	0.01	11.4	20.0	
Bromodichloromethane	0.488	0.528	0.01	8.2	20.0	
cis-1,3-Dichloropropene	0.499	0.437	0.01	12.4	20.0	
4-Methyl-2-pentanone	0.255	0.211	0.01	17.2	20.0	
Toluene	1.093	1.040	0.01	4.8	20.0	
trans-1,3-Dichloropropene	0.504	0.487	0.01	3.4	20.0	
1,1,2-Trichloroethane	0.274	0.266	0.01	2.9	20.0	
Tetrachloroethene	0.376	0.375	0.01	0.3	20.0	
2-Hexanone	0.230	0.209	0.01	9.1	20.0	
Dibromochloromethane	0.575	0.608	0.01	5.7	20.0	
1,2-Dibromoethane	0.501	0.467	0.01	6.8	20.0	
Chlorobenzene	1.146	1.122	0.3	2.1	20.0	
Ethylbenzene	0.550	0.524	0.01	4.7	20.0	
m,p-Xylene	0.664	0.670	0.01	0.9	20.0	
o-Xylene	0.653	0.646	0.01	1.1	20.0	
Xylene (Total)	0.661	0.662	0.01	0.2	20.0	

FORM 7
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD0405

Instrument ID: V2 Calibration Date: 04/07/05 Time: 1051

Lab File ID: V2G7801 Init. Calib. Date(s): 04/04/05 04/04/05

Heated Purge: (Y/N) N Init. Calib. Times: 1523 1717

GC Column: DB-624 ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D	
Styrene	1.118	1.160	0.01	3.8	20.0	
Bromoform	0.385	0.446	0.1	15.8	20.0	
Isopropylbenzene	1.435	1.493	0.01	4.0	20.0	
1,1,2,2-Tetrachloroethane	1.025	0.922	0.3	10.0	20.0	
1,3-Dichlorobenzene	1.662	1.523	0.01	8.4	20.0	
1,4-Dichlorobenzene	1.793	1.686	0.01	6.0	20.0	
1,2-Dichlorobenzene	1.679	1.588	0.01	5.4	20.0	
1,2-Dibromo-3-chloropropane	0.198	0.210	0.01	6.1	20.0	
1,2,4-Trichlorobenzene	0.923	0.830	0.01	10.1	20.0	
1,1,2-Trichloro-1,2,2-Triflu	0.306	0.371	0.01	21.2	20.0	<-
Methyl Acetate	0.206	0.240	0.01	16.5	20.0	
Cyclohexane	0.318	0.270	0.01	15.1	20.0	
Methylcyclohexane	0.265	0.238	0.01	10.2	20.0	
Dibromofluoromethane	0.380	0.408	0.01	7.4	20.0	
1,2-Dichloroethane-d4	0.075	0.074	0.01	1.3	20.0	
Toluene-d8	1.316	1.350	0.01	2.6	20.0	
Bromofluorobenzene	0.526	0.589	0.01	12.0	20.0	

FORM 6
PCB INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date(s): 04/21/05 04/22/05

Column: DB-1707 ID: 0.53 (mm) Calibration Time(s): 1916 0429

LAB FILE ID: RF0.1: E3E8713F RF0.5: E3E8714F RF1: E3E8715F
RF2.5: E3E8716F RF5: E3E8717F

COMPOUND	RF0.1	RF0.5	RF1	RF2.5	RF5
Aroclor-1016	56420.000	41810.000	36019.000	29071.600	26208.400
(2)	136630.00	121522.00	106011.00	88022.800	78190.200
(3)	53540.000	45400.000	40649.000	35148.000	30776.200
Aroclor-1221			9520.000		
(2)			18752.000		
(3)			50803.000		
Aroclor-1232			17726.000		
(2)			34226.000		
(3)			53499.000		
Aroclor-1242	75170.000	62862.000	53854.000	45684.400	39144.600
(2)	46030.000	36630.000	33255.000	29615.200	27522.600
(3)	48550.000	32762.000	28504.000	25029.200	22593.400
Aroclor-1248	35620.000	32312.000	32363.000	28203.200	26366.400
(2)	46230.000	46666.000	46347.000	39705.200	36975.600
(3)	54890.000	51758.000	52054.000	44406.400	41487.200
Aroclor-1254	63590.000	55554.000	50511.000	43091.600	39772.000
(2)	90160.000	79600.000	73438.000	65075.200	60166.200
(3)	72610.000	67880.000	63451.000	56372.000	52342.800
Aroclor-1260	99150.000	88940.000	80314.000	69748.400	64777.200
(2)	167930.00	153894.00	142827.00	127284.00	118624.60
(3)	74360.000	71416.000	67173.000	60246.000	57055.400
Tetrachloro-m-xylene	4287000.0	3748100.0	3215000.0	2628520.0	2381420.0
Decachlorobiphenyl	1263000.0	1167100.0	1104800.0	986360.00	918540.00

FORM VI PCB

FORM 6
PCB INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date(s): 04/21/05 04/22/05

Column: DB-1707 ID: 0.53 (mm) Calibration Time(s): 1916 0429

COMPOUND	CURVE	COEFFICENTS A0	A1	%RSD OR R^2
Aroclor-1016	LINR	-0.2012575	3.871e-005	0.993
(2)	LINR	-0.1821785	1.288e-005	0.993
(3)	LINR	-0.1677060	3.255e-005	0.993
Aroclor-1221	AVRG		9520.00000	0.0
(2)	AVRG		18752.0000	0.0
(3)	AVRG		50803.0000	0.0
Aroclor-1232	AVRG		17726.0000	0.0
(2)	AVRG		34226.0000	0.0
(3)	AVRG		53499.0000	0.0
Aroclor-1242	LINR	-0.2019095	2.56e-005	0.990
(2)	LINR	-0.1174503	3.661e-005	0.998
(3)	LINR	-0.1618458	4.47e-005	0.996
Aroclor-1248	AVRG		30972.9200	11.9
(2)	AVRG		43184.7600	10.5
(3)	AVRG		48919.1200	11.6
Aroclor-1254	AVRG		50503.7200	19.0
(2)	AVRG		73687.8800	16.1
(3)	AVRG		62531.1600	13.2
Aroclor-1260	AVRG		80585.9200	17.3
(2)	AVRG		142111.920	14.0
(3)	AVRG		66050.0800	11.1
Tetrachloro-m-xylene	LINR	-3.65e-003	4.248e-007	0.994
Decachlorobiphenyl	AVRG		1087960.00	12.7

FORM VI PCB

FORM 6
PCB INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date(s): 04/21/05 04/22/05

Column: DB-608 ID: 0.53 (mm) Calibration Time(s): 1916 0429

LAB FILE ID: RF0.1: E3E8713R RF0.5: E3E8714R RF1: E3E8715R
RF2.5: E3E8716R RF5: E3E8717R

COMPOUND	RF0.1	RF0.5	RF1	RF2.5	RF5
Aroclor-1016	14340.000	13194.000	11800.000	9969.600	8822.600
(2)	50040.000	46144.000	41602.000	35530.800	31665.000
(3)	20800.000	19392.000	17215.000	14626.400	13074.200
Aroclor-1221			5231.000		
(2)			6848.000		
(3)			18536.000		
Aroclor-1232			10566.000		
(2)			20541.000		
(3)			8723.000		
Aroclor-1242	42540.000	37568.000	33825.000	29742.400	26970.000
(2)	19720.000	17270.000	15386.000	13589.200	12261.800
(3)	16630.000	15144.000	13833.000	12528.800	11541.200
Aroclor-1248	26060.000	22702.000	21671.000	18926.000	17520.400
(2)	43760.000	38474.000	36431.000	31412.800	28922.600
(3)	23380.000	20358.000	19792.000	18013.200	17094.800
Aroclor-1254	53130.000	44894.000	41303.000	36262.800	33302.800
(2)	38100.000	34324.000	32213.000	28778.800	26915.400
(3)	46290.000	39904.000	37478.000	33524.800	31468.400
Aroclor-1260	94830.000	90464.000	85734.000	77653.600	72319.000
(2)	62020.000	58054.000	55479.000	50603.200	47779.800
(3)	22890.000	21190.000	20286.000	18911.600	18495.400
Tetrachloro-m-xylene	706000.00	661500.00	623900.00	573520.00	552210.00
Decachlorobiphenyl	1105500.0	963000.00	896750.00	804060.00	770770.00

FORM VI PCB

FORM 6
PCB INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date(s): 04/21/05 04/22/05

Column: DB-608 ID: 0.53 (mm) Calibration Time(s): 1916 0429

COMPOUND	CURVE	COEFFICENT A1	%RSD OR R^2
Aroclor-1016	AVRG	11625.2400	19.4
(2)	AVRG	40996.3600	18.3
(3)	AVRG	17021.5200	18.9
Aroclor-1221	AVRG	5231.00000	0.0
(2)	AVRG	6848.00000	0.0
(3)	AVRG	18536.0000	0.0
Aroclor-1232	AVRG	10566.0000	0.0
(2)	AVRG	20541.0000	0.0
(3)	AVRG	8723.00000	0.0
Aroclor-1242	AVRG	34129.0800	18.1
(2)	AVRG	15645.4000	18.9
(3)	AVRG	13935.4000	14.5
Aroclor-1248	AVRG	21375.8800	15.6
(2)	AVRG	35800.0800	16.4
(3)	AVRG	19727.6000	12.3
Aroclor-1254	AVRG	41778.5200	18.6
(2)	AVRG	32066.2400	13.8
(3)	AVRG	37733.0400	15.4
Aroclor-1260	AVRG	84200.1200	10.9
(2)	AVRG	54787.2000	10.4
(3)	AVRG	20354.6000	8.7
Tetrachloro-m-xylene	AVRG	623426.000	10.1
Decachlorobiphenyl	AVRG	908016.000	14.8

FORM VI PCB

FORM 6
PCB INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date(s): 04/21/05 04/22/05

Column: DB-1707 ID: 0.53 (mm) Calibration Time(s): 1916 0429

LAB FILE ID: RT1: E3E8713F RT2: E3E8714F RT3: E3E8715F
RT4: E3E8716F RT5: E3E8717F

COMPOUND	RT1	RT2	RT3	RT4	RT5
Aroclor-1016	10.270	10.270	10.270	10.270	10.280
(2)	12.080	12.080	12.080	12.070	12.080
(3)	12.430	12.430	12.430	12.430	12.440
Aroclor-1221			7.940		
(2)			10.130		
(3)			10.280		
Aroclor-1232			9.760		
(2)			11.270		
(3)			12.080		
Aroclor-1242	11.270	11.260	11.260	11.270	11.260
(2)	12.440	12.440	12.440	12.440	12.430
(3)	13.480	13.480	13.480	13.480	13.470
Aroclor-1248	13.730	13.730	13.730	13.730	13.730
(2)	14.030	14.020	14.020	14.020	14.020
(3)	14.150	14.150	14.150	14.150	14.140
Aroclor-1254	14.460	14.460	14.450	14.450	14.450
(2)	15.520	15.520	15.510	15.510	15.510
(3)	15.760	15.760	15.750	15.750	15.750
Aroclor-1260	16.050	16.050	16.050	16.050	16.050
(2)	17.970	17.970	17.970	17.970	17.970
(3)	18.870	18.870	18.870	18.870	18.880
Tetrachloro-m-xylene	8.560	8.560	8.560	8.560	8.570
Decachlorobiphenyl	21.220	21.220	21.220	21.220	21.220

FORM VI PCB

FORM 6
PCB INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date(s): 04/21/05 04/22/05

Column: DB-1707 ID: 0.53 (mm) Calibration Time(s): 1916 0429

COMPOUND	MEAN RT	RT WINDOW FROM	RT WINDOW TO
Aroclor-1016	10.272	10.207	10.347
(2)	12.078	12.007	12.147
(3)	12.432	12.367	12.507
Aroclor-1221	7.940	7.867	8.007
(2)	10.130	10.057	10.197
(3)	10.280	10.210	10.350
Aroclor-1232	9.760	9.690	9.830
(2)	11.270	11.197	11.337
(3)	12.080	12.013	12.153
Aroclor-1242	11.264	11.190	11.330
(2)	12.438	12.363	12.503
(3)	13.478	13.403	13.543
Aroclor-1248	13.730	13.660	13.800
(2)	14.022	13.947	14.087
(3)	14.148	14.073	14.213
Aroclor-1254	14.454	14.383	14.523
(2)	15.514	15.443	15.583
(3)	15.754	15.683	15.823
Aroclor-1260	16.050	15.983	16.123
(2)	17.970	17.903	18.043
(3)	18.872	18.807	18.947
Tetrachloro-m-xylene	8.562	8.517	8.617
Decachlorobiphenyl	21.220	21.123	21.323

FORM VI PCB

FORM 6
PCB INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date(s): 04/21/05 04/22/05

Column: DB-608 ID: 0.53 (mm) Calibration Time(s): 1916 0429

LAB FILE ID: RT1: E3E8713R RT2: E3E8714R RT3: E3E8715R
RT4: E3E8716R RT5: E3E8717R

COMPOUND	RT1	RT2	RT3	RT4	RT5
Aroclor-1016	8.060	8.050	8.050	8.050	8.050
(2)	9.890	9.880	9.880	9.880	9.880
(3)	10.140	10.140	10.140	10.140	10.140
Aroclor-1221			5.760		
(2)			7.570		
(3)			8.060		
Aroclor-1232			8.910		
(2)			9.890		
(3)			10.150		
Aroclor-1242	9.890	9.890	9.880	9.880	9.880
(2)	11.090	11.080	11.080	11.080	11.080
(3)	11.270	11.260	11.260	11.260	11.260
Aroclor-1248	11.260	11.250	11.260	11.250	11.250
(2)	11.890	11.880	11.880	11.880	11.880
(3)	12.340	12.330	12.330	12.330	12.320
Aroclor-1254	13.080	13.080	13.080	13.070	13.070
(2)	13.570	13.560	13.560	13.550	13.550
(3)	14.450	14.450	14.450	14.450	14.450
Aroclor-1260	15.640	15.640	15.640	15.640	15.640
(2)	16.270	16.270	16.270	16.270	16.280
(3)	17.380	17.380	17.380	17.380	17.390
Tetrachloro-m-xylene	6.550	6.550	6.550	6.550	6.550
Decachlorobiphenyl	18.070	18.070	18.070	18.080	18.080

FORM 6
PCB INITIAL CALIBRATION DATA

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date(s): 04/21/05 04/22/05

Column: DB-608 ID: 0.53 (mm) Calibration Time(s): 1916 0429

COMPOUND	MEAN RT	RT WINDOW FROM	RT WINDOW TO
Aroclor-1016	8.052	7.980	8.120
(2)	9.882	9.810	9.950
(3)	10.140	10.070	10.210
Aroclor-1221	5.760	5.690	5.830
(2)	7.570	7.497	7.637
(3)	8.060	7.987	8.127
Aroclor-1232	8.910	8.843	8.983
(2)	9.890	9.820	9.960
(3)	10.150	10.077	10.217
Aroclor-1242	9.884	9.810	9.950
(2)	11.082	11.007	11.147
(3)	11.262	11.187	11.327
Aroclor-1248	11.254	11.183	11.323
(2)	11.882	11.807	11.947
(3)	12.330	12.253	12.393
Aroclor-1254	13.076	13.003	13.143
(2)	13.558	13.483	13.623
(3)	14.450	14.377	14.517
Aroclor-1260	15.640	15.573	15.713
(2)	16.272	16.207	16.347
(3)	17.382	17.320	17.460
Tetrachloro-m-xylene	6.550	6.500	6.600
Decachlorobiphenyl	18.074	17.980	18.180

FORM VI PCB

FORM 7
PCB CONTINUING CALIBRATION CHECK

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date: 04/29/05 Time: 1544

Lab File ID: E3E8919F Init. Calib. Date(s): 04/22/05 04/22/05

Init. Calib. Times: 0244 0429

GC Column: DB-1707 ID: 0.53 (mm)

COMPOUND	SAMPLE AMOUNT	CAL1 AMOUNT	CURVE	%D	MAX %d	
Aroclor-1016	1.4	1.0	LINR	40.0	15.0	<-
(2)	1.4	1.0	LINR	40.0	15.0	<-
(3)	1.4	1.0	LINR	40.0	15.0	<-
Aroclor-1260	1.0	1.0	AVRG	0.0	15.0	
(2)	1.0	1.0	AVRG	0.0	15.0	
(3)	1.0	1.0	AVRG	0.0	15.0	
Tetrachloro-m-xylene	0.030	0.020	LINR	50.0	15.0	<-
Decachlorobiphenyl	0.021	0.020	AVRG	5.0	15.0	

FORM VII PCB

FORM 7
PCB CONTINUING CALIBRATION CHECK

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date: 04/29/05 Time: 1544

Lab File ID: E3E8919R Init. Calib. Date(s): 04/22/05 04/22/05

Init. Calib. Times: 0244 0429

GC Column: DB-608 ID: 0.53 (mm)

COMPOUND	$\overline{RRF}$	RRF1	MIN RRF	%D	MAX %D
Aroclor-1016	11625.240	11115.000	0.01	4.4	15.0
(2)	40996.360	40443.000	0.01	1.3	15.0
(3)	17021.520	16777.000	0.01	1.4	15.0
Aroclor-1260	84200.120	84862.000	0.01	0.8	15.0
(2)	54787.200	55604.000	0.01	1.5	15.0
(3)	20354.600	20852.000	0.01	2.4	15.0
Tetrachloro-m-xylene	623426.00	571600.00	0.01	8.3	15.0
Decachlorobiphenyl	908016.00	903300.00	0.01	0.5	15.0

FORM VII PCB

FORM 7
PCB CONTINUING CALIBRATION CHECK

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date: 04/29/05 Time: 2251

Lab File ID: E3E8934F Init. Calib. Date(s): 04/22/05 04/22/05

Init. Calib. Times: 0244 0429

GC Column: DB-1707 ID: 0.53 (mm)

COMPOUND	SAMPLE AMOUNT	CAL1 AMOUNT	CURVE	%D	MAX %d	
Aroclor-1016	1.3	1.0	LINR	30.0	15.0	<-
(2)	1.3	1.0	LINR	30.0	15.0	<-
(3)	1.3	1.0	LINR	30.0	15.0	<-
Aroclor-1260	0.96	1.0	AVRG	4.0	15.0	
(2)	0.96	1.0	AVRG	4.0	15.0	
(3)	0.96	1.0	AVRG	4.0	15.0	
Tetrachloro-m-xylene	0.029	0.020	LINR	45.0	15.0	<-
Decachlorobiphenyl	0.020	0.020	AVRG	0.0	15.0	

FORM 7
PCB CONTINUING CALIBRATION CHECK

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Instrument ID: E3 Calibration Date: 04/29/05 Time: 2251

Lab File ID: E3E8934R Init. Calib. Date(s): 04/22/05 04/22/05

Init. Calib. Times: 0244 0429

GC Column: DB-608 ID: 0.53 (mm)

COMPOUND	$\overline{RRF}$	RRF1	MIN RRF	%D	MAX %D
Aroclor-1016	11625.240	10761.000	0.01	7.4	15.0
(2)	40996.360	39119.000	0.01	4.6	15.0
(3)	17021.520	16172.000	0.01	5.0	15.0
Aroclor-1260	84200.120	80839.000	0.01	4.0	15.0
(2)	54787.200	52204.000	0.01	4.7	15.0
(3)	20354.600	19714.000	0.01	3.1	15.0
Tetrachloro-m-xylene	623426.00	550850.00	0.01	11.6	15.0
Decachlorobiphenyl	908016.00	853000.00	0.01	6.0	15.0

FORM 10
PCB IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.

P3RLCS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Lab Sample ID: LCS-17898 Date(s) Analyzed: 04/29/05 04/29/05

Instrument ID (1): E3 Instrument ID (2): E3

GC Column(1): DB-1707 ID: 0.53(mm) GC Column(2): DB-608 ID: 0.53(mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	%D
Aroclor-1016 COLUMN 1	1	10.26	10.21	10.35	16000		
	2	12.06	12.01	12.15	15000		
	3	12.42	12.37	12.51	15000		
	4						
	5					15000	
COLUMN 2	1	8.05	7.98	8.12	11000		
	2	9.88	9.81	9.95	11000		
	3	10.13	10.07	10.21	11000		
	4						
	5					11000	30.8
Aroclor-1260 COLUMN 1	1	16.03	15.98	16.12	12000		
	2	17.95	17.90	18.04	11000		
	3	18.86	18.81	18.95	12000		
	4						
	5					12000	
COLUMN 2	1	15.63	15.57	15.71	12000		
	2	16.27	16.21	16.35	12000		
	3	17.38	17.32	17.46	12000		
	4						
	5					12000	0.0
COLUMN 1	1						
	2						
	3						
	4						
	5						
COLUMN 2	1						
	2						
	3						
	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

FORM 10
PCB IDENTIFICATION SUMMARY
FOR MULTICOMPONENT ANALYTES

CLIENT SAMPLE NO.

P3RLCSD

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: D0405

Lab Sample ID: LCSD-17898 Date(s) Analyzed: 04/29/05 04/29/05

Instrument ID (1): E3 Instrument ID (2): E3

GC Column(1): DB-1707 ID: 0.53 (mm) GC Column(2): DB-608 ID: 0.53 (mm)

ANALYTE	PEAK	RT	RT WINDOW FROM	RT WINDOW TO	CONCENTRATION	MEAN CONCENTRATION	%D
Aroclor-1016 COLUMN 1	1	10.26	10.21	10.35	16000		
	2	12.06	12.01	12.15	16000		
	3	12.42	12.37	12.51	16000		
	4						
	5					16000	
Aroclor-1016 COLUMN 2	1	8.05	7.98	8.12	11000		
	2	9.87	9.81	9.95	11000		
	3	10.13	10.07	10.21	12000		
	4						
	5					11000	37.0
Aroclor-1260 COLUMN 1	1	16.03	15.98	16.12	12000		
	2	17.95	17.90	18.04	12000		
	3	18.86	18.81	18.95	12000		
	4						
	5					12000	
Aroclor-1260 COLUMN 2	1	15.63	15.57	15.71	12000		
	2	16.26	16.21	16.35	12000		
	3	17.38	17.32	17.46	12000		
	4						
	5					12000	0.0
COLUMN 1	1						
	2						
	3						
	4						
	5						
COLUMN 2	1						
	2						
	3						
	4						
	5						

At least 3 peaks are required for identification of multicomponent analytes.

APPENDIX E

SURVEY DATA

LOUIS FEDERICI and ASSOCIATES

365 Smith Street, Providence, RI 02908 Tele: 401-331-1570 Fax: 401-331-1593

land surveyors biologists planners

Tabulation of field located Soil Borings, Monitoring Wells, and Features
at The Surface Warfare Officers School (SWOS) Site at the Newport Naval Base, in Newport, RI

LFA PROJECT NUMBER = 20050407

Date Surveyed: 06/01/05
Horizontal = State of Rhode Island Grid Coordinate System (NAD1983).
Vertical = Naval Base Mean Low Water.

LFA PT. NO.	ENSR I.D.	NORTHING	EASTING	TOP OF CASE EL.	TOP OF RISER EL.	EXISTING GRADE EL.	BENCH MARK EL.
500	DRILL HOLE	156695.56	375961.59				12.86
501	PK NAIL	156830.30	375250.61				8.73
529	DRILL HOLE	156785.19	375494.86				16.22
1081	SB-05	156688.47	375510.49			11.5	
1082	SB-04	156628.13	375512.97			11.3	
1083	SB-15	156580.66	375503.06			12.0	
1084	SB-03	156616.75	375580.75			11.0	
1085	OFFTA-MW-05	156694.94	375585.64	12.50	12.40	12.5	
1086	SB-02	156693.99	375574.00			12.1	
1087	SB-01	156723.97	375574.29			12.2	
1088	MW-03/SB-06	156732.81	375512.68	11.34	11.21	11.3	
1089	SB-08	156746.42	375433.63			10.7	
1090	SB-12	156753.84	375382.55			10.4	
1091	MW-04/SB-07	156687.06	375455.04	11.28	11.06	11.3	
1092	SB-13	156686.68	375411.26			11.3	
1093	MW-05/SB-18	156765.41	375338.51	10.32	10.21	10.3	
1094	SB-17	156784.48	375279.86			10.2	
1095	SB-14	156573.58	375310.95			12.7	
1262	MW-ENSR-1	156774.48	375450.68	10.46	9.82	10.5	
1263	MW-ENSR-2	156811.38	375246.13	8.79	8.17	8.8	
1267	MW-ENSR-3	156870.88	375007.83	8.14	7.89	8.1	
1272	OFFTA-MW-11S	157094.84	375418.35	7.81	7.70	7.8	
1273	OFFTA-MW-11R	157106.10	375434.80	7.66	7.38	7.7	
1279	SB-11	156612.89	375651.90			12.8	
1280	OFFTA-MW-6S	156537.85	375703.70	13.72	13.53	13.3	
1281	OFFTA-MW-6R	156544.71	375724.45	14.05	13.46	13.6	
1321	MW-01/SB-09	156402.55	375621.22	12.41	12.03	12.4	
1339	SB-16	156475.73	375504.99			12.6	
1354	SB-19	156714.85	375298.76			11.5	
1446	MW-02/SB-20	156394.73	375339.84	12.20	12.01	12.2	
1567	OFFTA-MW-102	157072.25	375583.11	8.63	8.49	8.6	
1568	OFFTA-MW-2D	157034.81	375654.91	9.15	8.59	9.2	
1569	OFFTA-MW-10S	156938.68	375799.51	10.49	10.36	10.4	
1571	OFFTA-MW-1R	156829.66	375907.34	11.51	11.39	11.5	
1574	SB-10	156540.04	375566.20			10.9	

Louis Federici PLS
6/21/05
RI Reg. Number 1646

APPENDIX F

FINAL REPORT AND RISK ASSESSMENT FOR WORKER EXPOSURE AT THE SWOS SITE

U.S. NAVY ENGINEERING FIELD ACTIVITY NORTHEAST
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62472-99-D-0032
TASK ORDER NO. 0093

FINAL REPORT AND RISK ASSESSMENT FOR WORKER EXPOSURE AT THE SWOS SITE NAVAL STATION NEWPORT PORTSMOUTH, RHODE ISLAND

September 5, 2003

Prepared by

Foster Wheeler Environmental Corporation
133 Federal Street
Boston, Massachusetts 02110

Revision	Date	Prepared by	Approved by	Pages Affected
0	9/5/03	J. McIntosh	S. Leach, P.E.	All

ND03-099
9/5/03

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EXECUTIVE SUMMARY

Foster Wheeler Environmental Corporation (Foster Wheeler) has prepared this Final Report and Risk Assessment for Construction Worker Exposure at the future Surface Warfare Officer's School (SWOS) site, which is located on Coaster's Harbor Island at the Naval Station Newport (NAVSTA), Portsmouth, Rhode Island. Construction of the SWOS and associated activities are being conducted by Military Construction (MILCON). During excavation to enable utility line installation for the SWOS, oily soils were discovered. In May 2003, Foster Wheeler conducted testpitting and collected samples to assess the concentrations of total petroleum hydrocarbons (TPH) and lead at depth (3-8-ft below ground surface [bgs]). Ten samples were collected and TPH and lead concentrations at 3 testpit locations at depth ranging from 4-8-ft bgs exceeded the Rhode Island Department of Environmental Management Industrial/Commercial Criteria. To enable completion of the utility line installation for the SWOS, in July 2003, Foster Wheeler developed a Sampling Plan for the SWOS site designed to collect representative samples of the soil that the MILCON construction workers would be exposed to during utility line installation and asphalt parking lot construction. The maximum depth associated with these construction tasks would be 3-ft bgs. In July 2003, Foster Wheeler collected a total of 10 surface and 10 subsurface soil samples. All samples were analyzed for total analyte list (TAL) metals and target compound list (TCL) constituents (PCBs, VOCs, pesticides, and SVOCs). Foster Wheeler reviewed the quality of the analytical data from the July 2003 sampling event and conducted a risk assessment to determine construction worker exposure risks during utility line installation and asphalt parking lot construction, which are included herein.

The analytical data for the project was found to be acceptable. Some data qualifications were made as noted herein in the organic and inorganic fractions due to field duplicates, MS/MSD, surrogate recovery, calibration verification, and PCB/pesticide target compound identification. A number of results for 2,4-dinitrophenol were rejected due to poor recovery in the laboratory control samples.

The construction worker evaluated in the risk assessment was calculated to have an excess lifetime cancer risk (ELCR) of 2.2×10^{-7}, which is below the United States Environmental Protection Agency acceptable risk range. This risk is lower than the most stringent endpoint of the USEPA's acceptable target risk range (i.e., 10^{-6} to 10^{-4} ELCR). The construction worker evaluated in this risk assessment was calculated to have a hazard index (HI) of 0.033, which is well below the USEPA's Threshold HI of 1.0.

1.0 INTRODUCTION

1.1 General Information

Foster Wheeler Environmental Corporation (Foster Wheeler) has prepared this Final Report and Risk Assessment for Worker Exposure for individuals constructing the Surface Warfare Officer's School (SWOS) at the Naval Station Newport, Portsmouth, Rhode Island (NAVSTA). Development of this report and associated activities were conducted under the U.S. Navy Engineering Field Activities Northeast (EFANE) Remedial Action Contract (RAC) N62472-99-D-0032, Contract Task Order 93 (CTO 93). The objective of this report is to identify the locations where soil samples were collected at the SWOS site on July 28-29, 2003 to support the risk assessment attached herein, include and discuss the quality of the analytical data from the July 2003 sampling event, and describe the results of the risk assessment for future construction worker exposure at the SWOS site.

1.2 NAVSTA

NAVSTA Newport is located approximately 60 miles southwest of Boston, Massachusetts and 25 miles south of Providence, Rhode Island (see Figure 1-1). It occupies approximately 1,063 acres, with portions of the facility located in the City of Newport and Towns of Middletown and Portsmouth, Rhode Island. The facility layout is long and narrow, following the western shoreline of Aquidneck Island for nearly 6 miles facing the east passage of Narragansett Bay.

The NAVSTA Newport facility has been in use by the Navy since the Civil War. During both World Wars I and II, military activities at the facility increased significantly and the base provided housing for many service people. In subsequent years, use of the on-site facilities were slowly phased out until Newport became headquarters of the Commander-Cruiser Destroyer Force Atlantic in 1962. In April 1973, the Shore Establishment Realignment (SER) Program resulted in the reorganization of naval forces, and activity again declined.

The entire NAVSTA Newport facility was listed on the U.S. Environmental Protection Agency (USEPA) National Priorities List (NPL) of abandoned or uncontrolled hazardous waste sites in November 1989. A Federal Facilities Interagency Agreement (FFA) for NAVSTA Newport was signed by the Navy, the State of Rhode Island, and the USEPA on March 23, 1992. The FFA outlines response action requirements under the Department of Defense Installation Restoration Program (IRP) at NAVSTA Newport.

1.2.1 Surface Warfare Officer's School

A Military Construction (MILCON) project is underway at Coaster's Harbor Island, NAVSTA, which is shown on Figure 1-1. MILCON is erecting a Surface Warfare Officer's School (SWOS) at the northern end of Coaster's Harbor Island. In the process of performing soil excavation to install subsurface utility lines, oily soils were discovered in areas adjacent to Taylor Drive. The field sampling identified in Sections 1.3 and 1.4 of this report were conducted. The results of the sampling discussed in Section 1.4 were input into a risk assessment to assess the exposure risks to MILCON project construction workers so that they may continue with the installation of electrical utility lines and parking lot construction. The risk assessment is also included herein and will serve as an addendum to the construction contractor's Site Specific Health and Safety Plan.

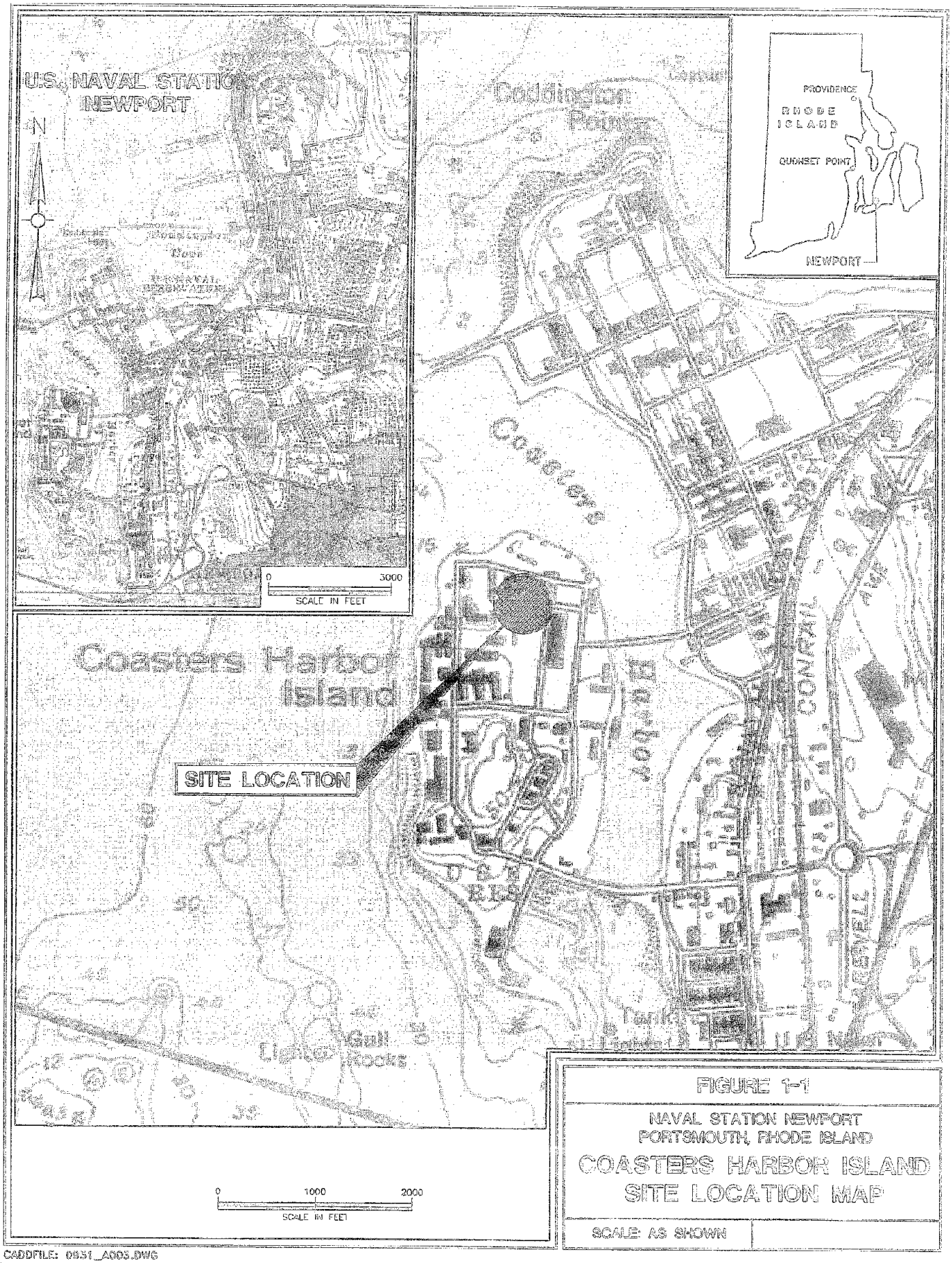


FIGURE 1-1

NAVAL STATION NEWPORT
PORTSMOUTH, RHODE ISLAND

COASTERS HARBOR ISLAND
SITE LOCATION MAP

SCALE: AS SHOWN

CADDFILE: 0831_A003.DWG

1.3 Previous Testpitting

On behalf of the Navy, on May 19, 2003, Foster Wheeler conducted testpitting in the area where the oily soils were observed. A total of five testpits were excavated. Each testpit was approximately 8 feet (ft) long by 6-ft wide. Individual testpits ranged between 4 and 8-ft in depth. Figure 1-2 shows the approximate locations of the testpits. Two samples were collected from each testpit at varying depths. Quality control/quality assurance (QA/QC) samples were also collected during the sampling effort. The samples were sent to AMRO Analytical Laboratory located in Merrimack, New Hampshire for lead and total petroleum hydrocarbon (TPH) analyses. Lead was analyzed using USEPA Method 6010B and TPH was analyzed using USEPA Method 8015B. Foster Wheeler received the analytical results on May 23, 2003.

Table 1-1 identifies the testpit sample analytical results. Table 1-1 contains a summary of the analytical results, a brief description of field conditions identified during sampling, and a qualifier describing the sample identification numbers. On May 28, 2003, the analytical results were screened against Rhode Island Department of Environmental Management (RIDEM) Industrial/Commercial Direct Exposure Criteria. As shown in Table 1-1, one sample (ID# NS-TP5-B-8) contained a lead concentration of 3,400 ppm, which exceeds the RIDEM I/C Criteria of 500 ppm. Three samples contained TPH concentrations that exceeded the RIDEM I/C Criteria of 2,500 ppm. These samples were NS-TP4-B-4, NS-TP4-B-5, and NS-TP2-B-4. The respective concentrations in these samples were 5,200 ppm, 3,300 ppm, and 12,000 ppm.

1.4 Sampling Plan Development and Deviations from the Plan

On July 21, 2003, a Final Sampling Plan to Support Construction Worker Exposure was submitted to the Navy by Foster Wheeler. The objective of the sampling effort was to collect representative data from the SWOS site to enable the development of a risk assessment for constructor worker exposure so that utility line installation and parking lot construction may be completed. Future utility installation will include electrical lines that will be installed at a maximum depth of 3 feet (ft) below ground surface (bgs). The length of the electrical lines to be installed is approximately 1,000 lineal feet (lf). The approximate locations of the subsurface electrical lines are shown on Figure 1-2. After electrical line installation, an asphalt parking lot will be constructed. Installation of the SWOS parking lot will involve regrading and reworking of the existing soil to an approximate depth of 1.5-ft bgs.

In accordance with the Final Sampling Plan (July 2003), a total of 10 surface soil and 10 subsurface soil samples were collected from ten sampling locations. One surface soil and one subsurface soil sample was collected from each location. Surface soil was taken from the 0-1.5-ft bgs interval. Subsurface soil samples were collected from the 1.5-3.0-ft bgs interval. If stained or odorous soil existed, it was preferentially collected for analyses. Field personnel used a Trimble Pro XRS hand-held Global Positioning System (GPS) field instrument to record the location of each of the 10 sample locations shown on Figure 1-2. Please refer to the Final Sampling Plan (July 2003) for information regarding the analytical methodologies and risk assessment parameters and assumptions.

1.4.1 Deviations from the Plan: Sampling Locations and Collection Methodology

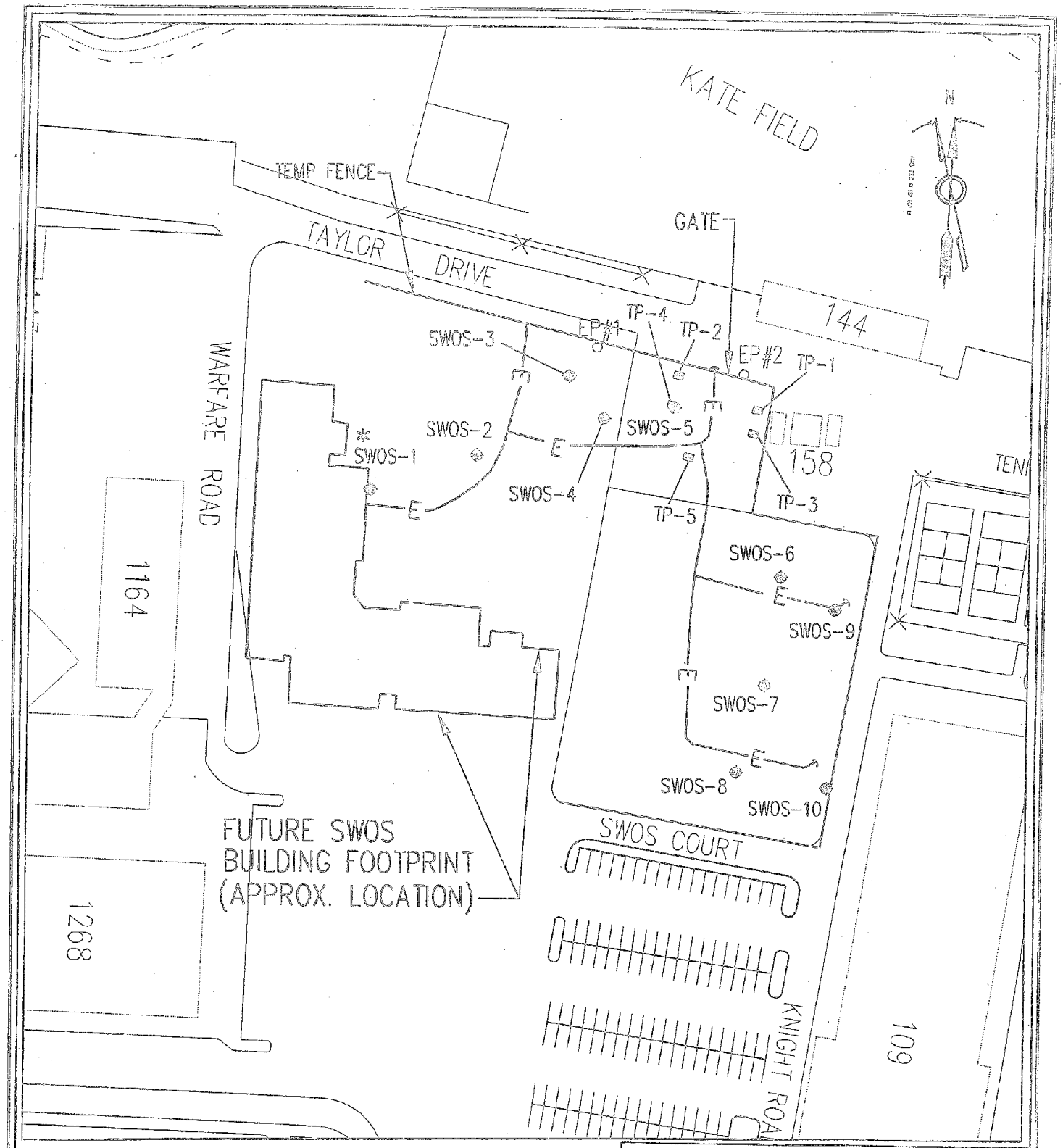
Due to existing utility line orientation and placement, construction laydown area placement, and impenetrable soil at certain locations, surface and subsurface soil sampling locations deviated slightly from those locations proposed in the Final Sampling Plan (July 2003). The actual sample locations were surveyed using the GPS unit and the approximate locations are shown on Figure 1-2.

The Final Sampling Plan (July 2003) indicated that field personnel would use a dedicated hand-held shovel to manually dig soil until a depth of 1.5-ft has been reached. Upon removal of the soil, personnel will place the excavated soil into disposable containers and would collect the VOC sample directly from the material within the disposable container. After collection of the VOC sample, the soil in the disposable container will be homogenized so that a composite sample may be collected for TAL metals, PCBs, SVOCs, and pesticides. Therefore, with the exception of the VOC samples, the plan suggested that the soil samples sent for off-site analysis would be composite sample representative of the 0-1.5-ft bgs interval. The same technique was planned for soil sample collection from the 1.5-3.0-ft interval.

The above technique was used for collection of the following four samples, sample depths are shown in parentheses:

- SWOS-8(0-1.5)
- SWOS-9(0-1.5)
- SWOS-10(0-1.5)
- SWOS-10(1.5-3)

Because the soil at the other locations was compacted as a result of MILCON-related construction activities, the soil was impenetrable using manual excavation at all other proposed sampling locations. To remedy this, on July 29, 2003, a Bobcat equipped with an auger was mobilized to the site and was used to advance each borehole to the depth of interest. A shovel was then used to collect each sample from the specified depths in accordance with the Final Sampling Plan. During sample collection, the PCB, TAL metals, pesticides, and SVOCs analyses were incorrectly noted as grab samples on the sample labels and chain-of-custody sheets when they were in fact composite samples. On July 30, 2003, the laboratory was notified of this error and noted this on the chain-of-custody for these samples.



KEY:

—E— LOCATION OF ELECTRIC LINE TO BE INSTALLED

○ ELECTRIC POLE

▫ TEST PIT LOCATION

◇ SAMPLE COLLECTION LOCATION

✳ APPROXIMATE LOCATION

NOTE:
ELECTRIC LINE LOCATION IS APPROXIMATE.

0 100 200
SCALE IN FEET

FIGURE 1-2

NAVAL STATION NEWPORT
NEWPORT, RHODE ISLAND

PREVIOUS TESTPITTING, PROPOSED ELECTRICAL LINE INSTALLATION, AND JULY 2003 SAMPLE LOCATIONS AT THE SWOS SITE

SCALE: AS SHOWN

CADDFILE: 0931_A004.DWG

Table 1-1
Testpit Subsurface Soil Analytical Results and Screen Against RIDEM I/C Criteria

SAMP_ID	PARAMETER	Care or Non-Care?	RESULT (mg/kg)	RIDEM - Industrial (ppm)	Exceed Industrial? (Y/N)	DATE ANALYZED	METHOD	LAB_ID	CAS_NO	NOTES
NS-EQPT-RIN	Lead	nc	ND	500	N	5/21/2003	SW6010B	0305152-01	7439-92-1	
	TPH		0.093	2500	N	5/21/2003	SW8015B			
NS-TP5-B-6	Lead	nc	500	500	N	5/21/2003	SW6010B	0305152-02	7439-92-1	Sample collected from Testpit 5, from the excavation base, 6-ft from soil surface.
	TPH		100	2500	N	5/22/2003	SW8015B			
NS-TP5-B-8	Lead	nc	3,400	500	Y	5/21/2003	SW6010B	0305152-03	7439-92-1	Sample collected from Testpit 5, from the excavation base, 8-ft from soil surface.
	TPH		100	2500	N	5/22/2003	SW8015B			
NS-TP4-B-4	Lead	nc	110	500	N	5/21/2003	SW6010B	0305152-04	7439-92-1	Sample collected from Testpit 4, from the excavation base, 4-ft from soil surface.
	TPH		5,200	2500	Y	5/22/2003	SW8015B			
NS-TP4-B-5	Lead	nc	85	500	N	5/21/2003	SW6010B	0305152-05	7439-92-1	Sample collected from Testpit 4, from the excavation base, 5-ft from soil surface.
	TPH		3300	2500	Y	5/22/2003	SW8015B			
NS-TP2-B-3	Lead	nc	200	500	N	5/21/2003	SW6010B	0305152-06	7439-92-1	Sample collected from Testpit 2, from the excavation base, 3-ft from soil surface.
	TPH		1800	2500	N	5/22/2003	SW8015B			
NS-TP2-B-4	Lead	nc	240	500	N	5/21/2003	SW6010B	0305152-07	7439-92-1	Sample collected from Testpit 2, from the excavation base, 4-ft from soil surface.
	TPH		12000	2500	Y	5/22/2003	SW8015B			
NS-TP1-B-4	Lead	nc	51	500	N	5/21/2003	SW6010B	0305152-08	7439-92-1	Sample collected from Testpit 1, from the excavation base, 4-ft from soil surface.
	TPH		38	2500	N	5/22/2003	SW8015B			
NS-TP1-B-4-FD	Lead	nc	45	500	N	5/21/2003	SW6010B	0305152-09	7439-92-1	Sample collected from Testpit 1, from the excavation base, 4-ft from soil surface (field duplicate).
	TPH		38	2500	N	5/22/2003	SW8015B			
NS-TP1-B-6.5	Lead	nc	170	500	N	5/22/2003	SW6010B	0305152-10	7439-92-1	Sample collected from Testpit 1, from the excavation base, 6.5-ft from soil surface.
	TPH		63	2500	N	5/22/2003	SW8015B			
NS-TP3-B-4	Lead	nc	130	500	N	5/22/2003	SW6010B	0305152-11	7439-92-1	Sample collected from Testpit 3, from the excavation base, 4-ft from soil surface.
	TPH		75	2500	N	5/22/2003	SW8015B			
NS-TP3-B-6	Lead	nc	110	500	N	5/22/2003	SW6010B	0305152-12	7439-92-1	Sample collected from Testpit 3, from the excavation base, 6-ft from soil surface.
	TPH		67	2500	N	5/22/2003	SW8015B			

2.0 QUALITY ASSURANCE/QUALITY CONTROL SOIL DATA REVIEW

A quality assurance/quality control (QA/QC) data review was performed on the results of soil samples collected at the SWOS site on July 28-29, 2003. Mitkem Corporation of Warwick, RI analyzed the samples for selected Volatile Organics (VOCs - USEPA Method 8260B), selected Semivolatile Organics (SVOCs - USEPA Method 8270C), Pesticides (USEPA Method 8081A), Polychlorinated Biphenyls (PCBs - USEPA Method 8082), and Total TAL Metals (USEPA Methods 6010B/7000). Overall, data for this project were found to be acceptable. Some data qualifications were made as noted in the organic or inorganic fractions due to field duplicates, MS/MSD, surrogate recovery, calibration verification, and PCB/Pesticide target compound identification. A number of results for 2,4-dinitrophenol were rejected due to poor recovery in the laboratory control samples. Based on this review, the qualified data are considered acceptable for project objectives.

Table 2-1 provides a list of sample numbers, dates collected, laboratory IDs, and the analyses performed.

Table 2-1
Samples Collected and Analyses Performed

Sample Number	SDG	Date Collected	LAB ID	VOC	SVOC	PAHs	PPCB	TAL Metals
SWOS-Eqpt-Rinst	B1229	7/28/03	B1229-01	X	X	X	X	X
SWOS-9(0-1.5)	B1229	7/28/03	B1229-02	X	X	X	X	X
SWOS-10(0-1.5)	B1229	7/28/03	B1229-03	X	X	X	X	X
SWOS-10(1.5-3)	B1229	7/28/03	B1229-04	X	X	X	X	X
SWOS-8(0-1.5)	B1229	7/28/03	B1229-05	X	X	X	X	X
SWOS-5(0-1.5)	B1235	7/29/03	B1235-01	X	X	X	X	X
SWOS-5(1.5-3)	B1235	7/29/03	B1235-02	X	X	X	X	X
SOWS-4(0-1..5)	B1235	7/29/03	B1235-03	X	X	X	X	X
SWOS-4(1.5-3)	B1235	7/29/03	B1235-04	X	X	X	X	X
SWOS-3(0-1.5)	B1235	7/29/03	B1235-05	X	X	X	X	X
SWOS-3(1.5-3)	B1235	7/29/03	B1235-06	X	X	X	X	X
SWOS-9(1.5-3)	B1235	7/29/03	B1235-07	X	X	X	X	X
SWOS-8(1.5-3)	B1235	7/29/03	B1235-08	X	X	X	X	X
SWOS-7(0-1.5)	B1235	7/29/03	B1235-09	X	X	X	X	X
SWOS-7(1.5-3)	B1235	7/29/03	B1235-010	X	X	X	X	X
SWOS-6(0-1.5)	B1235	7/29/03	B1235-011	X	X	X	X	X
SWOS-6(1.5-3)	B1235	7/29/03	B1235-012	X	X	X	X	X
SWOS-2(0-1.5)	B1235	7/29/03	B1235-013	X	X	X	X	X
SWOS-2(1.5-3)	B1235	7/29/03	B1235-014	X	X	X	X	X
SWOS-1(0-1.5)	B1235	7/29/03	B1235-015	X	X	X	X	X
SWOS-1(1.5-3)	B1235	7/29/03	B1235-016	X	X	X	X	X
FIELD DUP	B1235	7/29/03	B1235-017	X	X	X	X	X

2.1 Objectives

The sample results and quality control data summarized on the laboratory reporting forms were reviewed for the following QA/QC criteria:

- Holding times
- Laboratory, preparation, and trip blanks
- Field and laboratory duplicate precision
- MS/MSD recoveries and relative percent differences (RPDs)
- Surrogate standard recoveries
- Laboratory control samples
- Internal standard areas
- PCB and pesticide target compound identification

The review performed on these QA/QC criteria was limited in scope and focused on laboratory summary sheets. A more comprehensive examination of the raw data (which, for example, would be included in an USEPA Tier III data validation) was not included within the Scope of Work. For details of the analytical data review, refer to Appendix A.

3.0 RISK ASSESSMENT

3.1 Conceptual Site Model

The Conceptual Site Model (CSM) was developed to focus on a planned future construction worker at the site who would come into contact with surface and subsurface soil (down to a depth of three feet) along the planned route of the subsurface utilities in the parking lot area. Incidental ingestion, dermal absorption, and inhalation of particulates generated by the excavation/construction activity are the exposure routes associated to be evaluated relative to the soil in these areas (see Table 3-1).

3.2 Chemicals of Potential Concern

The risk assessment was performed using the surface soil and subsurface soil data collected as part of this task (see Section 1.4). Chemicals of Potential Concern (COPCs) were identified using the screening process described in Risk Assessment Guidance for Superfund (RAGS) Part A (USEPA, 1989). This COPC identification process includes the following steps.

- The analytical data for all detected chemicals were compiled and the minimum and maximum detected concentrations were tabulated in RAGS Part D (USEPA, 2001c) format.
- The frequency of detection for each detected chemical were calculated and chemicals that were detected at a very low frequency were eliminated from the COPC list. For this sampling effort, because a total of 20 samples were collected, a "very low frequency□was defined as non-detect or only 1 detected sample out of 20 in accordance with RAGS Part A (USEPA, 1989).
- The maximum detected concentration for each detected chemical was compared to a chemical-specific toxicity screening criteria. Any chemical whose maximum concentration was less than the toxicity screening criteria was eliminated from the COPC list. The toxicity screening criteria used was the Region 9 Preliminary Remediation Goals (USEPA, 2002) for residential soil based on a target carcinogenic risk of $1x10^{-6}$ and a target non-carcinogenic hazard index of 0.1.
- Essential human nutrients (calcium, iron, magnesium, potassium, and sodium), as defined in RAGS Part A (USEPA, 1989) Section 5.9.4, were eliminated from the COPC list.
- Chemicals that were detected at levels consistent with background were eliminated from the COPC list. The background soil concentrations were taken from the Kay Field/Old Fire Fighting Training Area (OFFTA) Site (Tetra Tech NUS, 2000).

The remaining chemicals, identified as COPCs, were carried through the quantitative portion of the risk assessment. Table 3-2 summarizes the COPC screening process and results.

3.3 Exposure Point Concentrations

Exposure point concentration (EPCs) were developed for each identified COPC. The 95% upper confidence limit (UCL) on the mean was calculated for each COPC using the USEPA software, Pro UCL (Version 2.1) (USEPA, 2001a). ProUCL uses a statistical test to determine if the data distribution for a COPC has a normal, lognormal, or nonparametric distribution. Based on this determination, ProUCL calculates the most technically appropriate UCL value. The minimum of the 95% UCL or the maximum detected value was taken as the EPC. Table 3-3 summarizes the EPC calculations.

TABLE 3-1

SELECTION OF EXPOSURE PATHWAYS

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil	Soil	Soil	Construction Worker	Adult	Incidental Ingestion	Quantitative	Associated with planned development activity.
						Dermal Absorption	Quantitative	
						Inhalation of Particulates	Quantitative	

TABLE 3-2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (N/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
Soil	72548	4,4-DDD	0.01	0.01	mg/kg	SWOS-9(1.5-3)	1 / 20	0.0035 - 0.0045	0.01	N/A	2.4 (ca)	N/A	N/A	N	BSL, IFD
	72559	4,4-DDE	0.0044 (J)	0.034	mg/kg	SWOS-10(1.5-3)	7 / 20	0.0035 - 0.0045	0.034	N/A	1.7 (ca)	N/A	N/A	N	BSL
	50293	4,4-DDT	0.0041	0.045	mg/kg	SWOS-10(1.5-3)	5 / 20	0.0035 - 0.0045	0.045	N/A	1.7 (ca)	N/A	N/A	N	BSL
	309002	Aldrin	0.0026 (J)	0.0026 (J)	mg/kg	SWOS-4(1.5-3)	1 / 20	0.0018 - 0.0023	0.0026	N/A	0.029 (ca)	N/A	N/A	N	BSL, IFD
	5103719	alpha-Chlordane	0.0022 (J)	0.0022 (J)	mg/kg	SWOS-9(1.5-3)	1 / 20	0.0018 - 0.0023	0.0022	N/A	1.6 (ca)	N/A	N/A	N	BSL, IFD
	5103742	gamma-Chlordane	0.0021 (J)	0.003	mg/kg	SWOS-4(1.5-3)	2 / 20	0.0018 - 0.0023	0.003	N/A	1.6 (ca)	N/A	N/A	N	BSL
	87616	1,2,3-Trichlorobenzene	0.004	0.004	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.004	N/A	N/A	N/A	N/A	N	IFD
	120821	1,2,4-Trichlorobenzene	0.003	0.003	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.003	N/A	35 (nc)	N/A	N/A	N	BSL, IFD
	95636	1,2,4-Trimethylbenzene	0.0008	0.002	mg/kg	SWOS-4(1.5-3)	3 / 20	0.0002 - 0.0008	0.002	N/A	5.2 (nc)	N/A	N/A	N	BSL
	95501	1,2-Dichlorobenzene	0.001	0.001	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.001	N/A	370 (sat)	N/A	N/A	N	BSL, IFD
	108678	1,3,5-Trimethylbenzene	0.0008	0.0009	mg/kg	SWOS-4(1.5-3)	2 / 20	0.0002 - 0.0008	0.0009	N/A	2.1 (nc)	N/A	N/A	N	BSL
	541731	1,3-Dichlorobenzene	0.001	0.001	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.001	N/A	1.6 (nc)	N/A	N/A	N	BSL, IFD
	106467	1,4-Dichlorobenzene	0.0007	0.002	mg/kg	SWOS-8(1.5-3)	2 / 20	0.0002 - 0.0008	0.002	N/A	3.4 (ca)	N/A	N/A	N	BSL
	78933	2-Butanone	0.0009 (J)	0.014	mg/kg	SWOS-2(0-1.5)	10 / 20	0.001 - 0.004	0.014	N/A	730 (nc)	N/A	N/A	N	BSL
	95498	2-Chlorotoluene	0.0006	0.0006	mg/kg	SWOS-2(1.5-3)	1 / 20	0.0002 - 0.0008	0.0006	N/A	16 (nc)	N/A	N/A	N	BSL, IFD
	591786	2-Hexanone	0.0011 (J)	0.0011 (J)	mg/kg	SWOS-1(1.5-3)-AVG	1 / 20	0.001 - 0.004	0.0011	N/A	N/A	N/A	N/A	N	IFD
	106434	4-Chlorotoluene	0.0008	0.0008	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.0008	N/A	N/A	N/A	N/A	N	IFD
	99876	4-Isopropyltoluene	0.0005	0.0008	mg/kg	SWOS-8(1.5-3)	3 / 20	0.0003 - 0.0008	0.0008	N/A	N/A	N/A	N/A	Y	FD
	71432	Benzene	0.0005	0.0005	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.0005	N/A	0.6 (ca)	N/A	N/A	N	BSL, IFD
	108861	Bromobenzene	0.0009	0.0009	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.0009	N/A	2.8 (nc)	N/A	N/A	N	BSL, IFD
	75150	Carbon Disulfide	0.0006	0.0006	mg/kg	SWOS-9(1.5-3)	1 / 20	0.0003 - 0.0008	0.0006	N/A	36 (nc)	N/A	N/A	N	BSL, IFD
	87683	Hexachlorobutadiene	0.001	0.001	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.001	N/A	9.2 (ca)	N/A	N/A	N	BSL, IFD
	74884	Iodomethane	0.0005	0.002	mg/kg	SWOS-2(1.5-3)	6 / 20	0.0003 - 0.0008	0.002	N/A	N/A	N/A	N/A	Y	FD
	108423	m,p-Xylene	0.0008	0.0008	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.0008	N/A	N/A	N/A	N/A	N	IFD
	75092	Methylene Chloride	0.0008 (J)	0.0045	mg/kg	SWOS-1(1.5-3)-AVG	17 / 20	0.001 - 0.002	0.0045	N/A	9.1 (ca)	N/A	N/A	N	BSL
	104518	n-Butylbenzene	0.001	0.001	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.001	N/A	240 (sat)	N/A	N/A	N	BSL, IFD
	91203	Naphthalene	0.0015	0.014	mg/kg	SWOS-8(1.5-3)	4 / 20	0.0002 - 0.0008	0.014	N/A	5.6 (nc)	N/A	N/A	N	BSL
	95476	o-Xylene	0.0004	0.0004	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.0004	N/A	N/A	N/A	N/A	N	IFD
	135988	sec-Butylbenzene	0.0007	0.0007	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.0007	N/A	220 (sat)	N/A	N/A	N	BSL, IFD
	100425	Styrene	0.0008	0.0008	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.0008	N/A	1,700 (sat)	N/A	N/A	N	BSL, IFD

TABLE 3-2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (NC) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
	98066	tert-Butylbenzene	0.0007	0.0007	mg/kg	SWOS-9(1.5-3)	1 / 20	0.0002 - 0.0008	0.0007	N/A	390 (est)	N/A	N/A	N	BSL, IFD
	108883	Toluene	0.0003 (J)	0.0006	mg/kg	SWOS-9(0-1.5)	4 / 20	0.0003 - 0.0008	0.0006	N/A	520 (est)	N/A	N/A	N	BSL
	75694	Trichlorofluoromethane	0.001	0.001	mg/kg	SWOS-9(1.5-3), SWOS-3(0-1.5)	2 / 20	0.0003 - 0.0008	0.001	N/A	39 (nc)	N/A	N/A	N	BSL
	1330207	Xylene (Total)	0.001	0.001	mg/kg	SWOS-8(1.5-3)	1 / 20	0.0002 - 0.0008	0.001	N/A	27 (nc)	N/A	N/A	N	BSL, IFD
	208968	Acenaphthylene	0.072 (J)	0.072 (J)	mg/kg	SWOS-3(1.5-3)	1 / 20	0.35 - 0.45	0.072	N/A	N/A	N/A	N/A	N	IFD
	120127	Anthracene	0.038 (J)	0.22 (J)	mg/kg	SWOS-3(1.5-3)	2 / 20	0.35 - 0.45	0.22	N/A	2,200 (nc)	N/A	N/A	N	BSL
	56553	Benzo(a)anthracene	0.06 (J)	0.57	mg/kg	SWOS-3(1.5-3)	16 / 20	0.39 - 0.42	0.57	N/A	0.62 (ca)	N/A	N/A	N	BSL
	50328	Benzo(a)pyrene	0.053 (J)	0.53	mg/kg	SWOS-3(1.5-3)	16 / 20	0.39 - 0.42	0.53	N/A	0.062 (ca)	N/A	N/A	Y	ASL
	205992	Benzo(b)fluoranthene	0.055 (J)	0.73	mg/kg	SWOS-3(1.5-3)	17 / 20	0.39 - 0.42	0.73	N/A	0.62 (ca)	N/A	N/A	Y	ASL
	191242	Benzo(g,h,i)perylene	0.039 (J)	0.22 (J)	mg/kg	SWOS-3(1.5-3)	11 / 20	0.35 - 0.44	0.22	N/A	N/A	N/A	N/A	Y	FD
	207089	Benzo(k)fluoranthene	0.04 (J)	0.36 (J)	mg/kg	SWOS-3(1.5-3)	15 / 20	0.38 - 0.42	0.36	N/A	6.2 (ca)	N/A	N/A	N	BSL
	86748	Carbazole	0.05 (J)	0.05 (J)	mg/kg	SWOS-3(1.5-3)	1 / 20	0.35 - 0.45	0.05	N/A	24 (ca)	N/A	N/A	N	BSL, IFD
	218019	Chrysene	0.045 (J)	0.58	mg/kg	SWOS-3(1.5-3)	17 / 20	0.39 - 0.42	0.58	N/A	62 (ca)	N/A	N/A	N	BSL
	53703	Dibenzo(a,h)anthracene	0.053 (J)	0.066 (J)	mg/kg	SWOS-3(1.5-3)	2 / 20	0.35 - 0.45	0.066	N/A	0.062 (ca)	N/A	N/A	Y	ASL
	132649	Dibenzofuran	0.045 (J)	0.045 (J)	mg/kg	SWOS-3(1.5-3)	1 / 20	0.35 - 0.45	0.045	N/A	29 (nc)	N/A	N/A	N	BSL, IFD
	206440	Fluoranthene	0.042 (J)	1.2	mg/kg	SWOS-3(1.5-3)	19 / 20	0.39	1.2	N/A	230 (nc)	N/A	N/A	N	BSL
	86737	Fluorene	0.068 (J)	0.068 (J)	mg/kg	SWOS-3(1.5-3)	1 / 20	0.35 - 0.45	0.068	N/A	270 (nc)	N/A	N/A	N	BSL, IFD
	193395	Indeno(1,2,3-cd)pyrene	0.039 (J)	0.25 (J)	mg/kg	SWOS-3(1.5-3)	9 / 20	0.35 - 0.44	0.25	N/A	0.62 (ca)	N/A	N/A	N	BSL
	85018	Phenanthrene	0.047 (J)	0.83	mg/kg	SWOS-3(1.5-3)	16 / 20	0.39 - 0.42	0.83	N/A	N/A	N/A	N/A	Y	FD
	129000	Pyrene	0.043 (J)	1	mg/kg	SWOS-3(1.5-3)	18 / 20	0.39 - 0.42	1	N/A	230 (nc)	N/A	N/A	N	BSL
	7439954	Magnesium	2020 (J)	5280 (J)	mg/kg	SWOS-1(0-1.5)	19 / 19	-	5,280	2,240	N/A	N/A	N/A	N	NUT
	7429905	Aluminum	8,840	18,000	mg/kg	SWOS-3(1.5-3)	20 / 20	-	18,000	11,900	7,600 (nc)	N/A	N/A	Y	ASL
	7440360	Antimony	0.18 (J)	2.1 (J)	mg/kg	SWOS-9(1.5-3)	8 / 20	0.14 - 0.2	2.1	0.67	3.1 (nc)	N/A	N/A	N	BSL
	7440382	Arsenic	4.3	16	mg/kg	SWOS-9(0-1.5)	20 / 20	-	16	5.55	0.39 (ca)	N/A	N/A	Y	ASL
	7440393	Barium	16.2 (J)	50.4 (J)	mg/kg	SWOS-5(1.5-3)	20 / 20	-	50.4	38.5	540 (nc)	N/A	N/A	N	BSL
	7440417	Beryllium	0.22 (J)	0.49	mg/kg	SWOS-7(0-1.5)	20 / 20	-	0.49	0.439	15 (nc)	N/A	N/A	N	BSL
	7440439	Cadmium	0.25 (J)	0.81 (J)	mg/kg	SWOS-3(1.5-3)	20 / 20	-	0.81	0.7	3.7 (nc)	N/A	N/A	N	BSL
	7440702	Calcium	401	1,910	mg/kg	SWOS-3(0-1.5)	20 / 20	-	1,910	1,220	N/A	N/A	N/A	N	NUT
	7440473	Chromium	10.6	21.7	mg/kg	SWOS-3(1.5-3)	20 / 20	-	21.7	20.2	30 (ca)	N/A	N/A	N	BSL
	7440484	Cobalt	7.3 (J)	18.1 (J)	mg/kg	SWOS-5(1.5-3)	20 / 20	-	18.1	9.01	900 (ca)	N/A	N/A	N	BSL

TABLE 3-2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration (Qualifier) (1)	Maximum Concentration (Qualifier) (1)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening (2)	Background Value (3)	Screening Toxicity Value (N/C) (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion (5)
	7440508	Copper	10.9	68.7	mg/kg	SWOS-8(0-1.5)	20 / 20	-	68.7	23.8	310 (nc)	N/A	N/A	N	BSL
	7439896	Iron	16,800	45,000	mg/kg	SWOS-3(1.5-3)	20 / 20	-	45,000	23,200	2,300 (nc)	N/A	N/A	N	NUT
	7439921	Lead	9.4 (J)	68.8 (J)	mg/kg	SWOS-7(0-1.5)	20 / 20	-	68.8	48.8	40 (nc)	N/A	N/A	Y	ASL
	7439965	Manganese	192 (J)	682 (J)	mg/kg	SWOS-6(1.5-3)	20 / 20	-	682	372	180 (nc)	N/A	N/A	Y	ASL
	7439976	Mercury	0.028 (J)	0.3	mg/kg	SWOS-6(1.5-3)	20 / 20	-	0.3	0.189	2.3 (nc)	N/A	N/A	N	BSL
	7440020	Nickel	13.2	32.1	mg/kg	SWOS-3(1.5-3)	20 / 20	-	32.1	17.4	160 (nc)	N/A	N/A	N	BSL
	7440097	Potassium	264	661.5	mg/kg	SWOS-1(1.5-3)-AVG	20 / 20	-	661.5	312	N/A	N/A	N/A	N	NUT
	7782492	Selenium	0.29	1.3	mg/kg	SWOS-2(0-1.5)	11 / 20	0.14 - 0.18	1.3	N/A	39 (nc)	N/A	N/A	N	BSL
	7440224	Silver	3.7 (J)	6.7 (J)	mg/kg	SWOS-5(1.5-3)	20 / 20	-	6.7	N/A	39 (nc)	N/A	N/A	N	BSL
	7440235	Sodium	32.9 (J)	89.7 (J)	mg/kg	SWOS-5(1.5-3)	20 / 20	-	89.7	N/A	N/A	N/A	N/A	N	NUT
	7440622	Vanadium	13.4	29.1	mg/kg	SWOS-3(1.5-3)	20 / 20	-	29.1	22.6	55 (nc)	N/A	N/A	N	BSL
	7440666	Zinc	42.6 (J)	105 (J)	mg/kg	SWOS-3(1.5-3)	20 / 20	-	105	225	2,300 (nc)	N/A	N/A	N	BSL, BKG

Footnote Instructions:

(1) J - Estimated

(2) Maximum detected concentration used for screening.

(3) Tetra Tech NUS, 2000. Background Soil Investigation for Old Fire Fighting Training Area, Naval Station Newport, Newport, Rhode Island. August. - Recommended Surface Soil Background Concentrations.

(4) USEPA, 2002. Region 9 Preliminary Remediation Goals Table. October. - ca = PRG based on carcinogenic effects; nc = PRG based on non-carcinogenic effects; sat = PRG based on soil saturation

(5) BSL = Below Screening Level; IFD = Infrequently Detected; NUT = Essential Nutrient; BKG = Background; ASL = Above Screening Level; FD = Frequently Detected

TABLE 3-3

EXPOSURE POINT CONCENTRATION SUMMARY

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean (1)	95% UCL (Distribution) (2)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic (3)	Rationale
Soil	4-Isopropyltoluene	mg/kg	0.0003	0.00044 (non-parametric)	0.0008	0.00044	mg/kg	95% Cheb	UCL < MAX
	Iodomethane	mg/kg	0.000482	0.000844 (non-parametric)	0.002	0.000844	mg/kg	95% Cheb	UCL < MAX
	Benzo(a)pyrene	mg/kg	0.164	0.216 (lognormal)	0.53	0.216	mg/kg	95% H-UCL	UCL < MAX
	Benzo(b)fluoranthene	mg/kg	0.211	0.286 (lognormal)	0.73	0.286	mg/kg	95% H-UCL	UCL < MAX
	Benzo(g,h,i)perylene	mg/kg	0.144	0.246 (non-parametric)	0.22 (J)	0.22	mg/kg	MAX	UCL > MAX
	Dibenzo(a,h)anthracene	mg/kg	0.183	0.256 (non-parametric)	0.066 (J)	0.066	mg/kg	MAX	UCL > MAX
	Phenanthrene	mg/kg	0.18	0.255 (lognormal)	0.83	0.255	mg/kg	95% H-UCL	UCL < MAX
	Aluminum	mg/kg	11,562	12,475 (lognormal)	18,000	12,475	mg/kg	95% H-UCL	UCL < MAX
	Arsenic	mg/kg	8.14	9.27 (lognormal)	16	9.27	mg/kg	95% H-UCL	UCL < MAX
	Lead	mg/kg	36.4	42 (normal)	66.8 (N*)	42	mg/kg	95% UCL	UCL < MAX
	Manganese	mg/kg	351	401 (lognormal)	682 (E)	401	mg/kg	95% H-UCL	UCL < MAX

Notes:
(1) 1/2 the detection limit was used for samples with non-detect concentrations.
(2) normal = data set is normally distributed; lognormal = data set is lognormally distributed; non-parametric = data set is neither normally nor lognormally distributed
(3) 95% Cheb = 95% Chebyshev (MVUE) UCL; 95% H-UCL = 95% UCL assuming data are lognormal; MAX = Maximum Detected Value; 95% UCL = 95% Student's t UCL

3.4 Exposure Assessment

The exposure assessment quantitatively describes the most potentially significant pathways through which the construction worker may contact contamination in the soil at the site. Equations defining the amount of chemical intake or dose received for each identified exposure pathway are shown in Table 3-4. The parameter values used in the intake equations which quantify the exposure scenarios were developed for the construction worker using USEPA risk assessment guidance (USEPA, 1989, 1995, 1996, 1997b, 1997c). An explicit effort was made to maintain a consistency of these reasonable maximum exposure assumptions with the assumptions previously made for similar assessments at other sites at NAVSTA Newport. The parameter values used in the risk assessment are shown in Table 3-4.

3.5 Toxicity Assessment

The toxicological information used in this risk assessment was based on non-carcinogenic (threshold) and carcinogenic (non-threshold) effects caused by exposure to chemicals that have been observed in humans and/or laboratory animals associated with a particular dose of that compound. The toxicological information is used in conjunction with the exposure assessment to characterize the level of risk associated with each COPC via each identified exposure pathway. Chemical-specific toxicological parameters (i.e., non-carcinogenic reference doses [RfDs]) and cancer slope factors [SFs]) were obtained from established USEPA sources according to the following hierarchy.

1. USEPA's Integrated Risk Information System (IRIS) on-line database (USEPA, 2003b).
2. Health Effects Assessment Summary Table (HEAST), (USEPA, 1997a).
3. Superfund Technical Support Center at the National Center for Environmental Assessment (NCEA).

These sources of toxicological information provide data applicable to the assessment of oral and inhalation pathways. The methodologies for evaluating dermal absorption are based on an estimation of absorbed dose while the IRIS-verified RfDs are typically based on an administered dose. Therefore, an adjustment of the oral toxicological factor to represent an absorbed rather than an administered dose is necessary to maintain consistency. Toxicological factors for the dermal absorption pathway were calculated from the oral values using an oral-to-dermal adjustment factor in accordance with USEPA protocol. The oral-to-dermal adjustment factor is based on the gastrointestinal (GI) absorption efficiencies listed in USEPA RAGS Part E, Exhibit 4.1 (USEPA, 2001b). The adjustment accounts for the absorption efficiency in the critical clinical or epidemiological study forming the basis of the published toxicity factor. The magnitude of the toxicity factor adjustment is inversely proportional to the absorption fraction in the critical study. As the absorption efficiency decreases, the difference between the absorbed dose and administered dose increases. Consistent with USEPA, 2001b, an adjustment was made when the following conditions were met:

- The toxicity value derived from the critical study was based on an administered dose (e.g., delivery in diet or by gavage) in its study design; and
- A scientifically defensible database demonstrates that the GI absorption of the chemical in question from a media (e.g., water, feed) similar to the one employed in the critical study is significantly less than 100% (i.e., <50%).

If these conditions were not met, complete (i.e., 100%) absorption was assumed and no adjustment of the oral toxicity value was made to obtain a toxicity value to be used for the dermal absorption route.

TABLE 3-4

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Incidental Ingestion	Construction Worker	Adult	Soil	CS	Chemical Concentration in Soil	Chemical-specific	mg/kg	See EPCs	Chronic Daily Intake (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	480	mg/day	(1)	CS x IR-S x FI x EF x ED x CF1
				EF	Exposure Frequency	48	days/year	(3)	BW x AT
				ED	Exposure Duration	1	year	(4)	
				BW	Body Weight	70	kg	(5)	
				CF1	Conversion Factor 1	1E-06	kg/mg	--	
				AT-N	Averaging Time (Non-Cancer)	365	days	(6)	
				AT-C	Averaging Time (Cancer)	25,550	days	(6)	
Dermal Absorption	Construction Worker	Adult	Soil	CS	Chemical Concentration in Soil	Chemical-specific	mg/kg	See EPCs	Dermally Absorbed Dose (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	7,014	cm2	(7)	CS x SA x SSAF x DABS x EV x EF x ED x CF1
				SSAF	Soil-to-Skin Adherence Factor	0.08	mg/cm2/event	(8)	BW x AT
				DABS	Dermal Absorption Factor (Solid)	Chemical-specific	unitless	(9)	
				EV	Event Frequency	1	events/day	(10)	
				EF	Exposure Frequency	48	days/year	(3)	
				ED	Exposure Duration	1	year	(4)	
				BW	Body Weight	70	kg	(5)	
				CF1	Conversion Factor 1	1E-06	kg/mg	--	
				AT-N	Averaging Time (Non-Cancer)	365	days	(6)	
				AT-C	Averaging Time (Cancer)	25,550	days	(6)	
Inhalation of Particulates	Construction Worker	Adult	Soil	CS	Chemical Concentration in Soil	Chemical-specific	mg/kg	See EPCs	Chronic Daily Intake (mg/kg-day) =
				PEF	Particulate Emission Factor from Soil	1.32E+09	m3/kg	(11)	CS x 1/PEF x IN x ET x EF x ED
				IN	Inhalation Rate	3.3	m3/hr	(5)	BW x AT
				ET	Exposure Time	8	hours/day	(12)	
				EF	Exposure Frequency	48	days/year	(3)	
				ED	Exposure Duration	1	year	(4)	
				BW	Body Weight	70	kg	(5)	
				AT-N	Averaging Time (Non-Cancer)	365	days	(6)	
				AT-C	Averaging Time (Cancer)	25,550	days	(6)	

TABLE 3-4 - *Continued*

Notes:

(1) USEPA, 1994. EPA Region I, Risk Updates. August 1994, Volume II.

(2) Professional Judgement. Fraction ingested in assumed to be 100% from source.

(3) Professional Judgement. Exposure Frequency based on 6 days per week for 8 weeks (2 months) = 48 days.

(4) Professional Judgement. 1 year of exposure.

(5) USEPA, 1997. Exposure Factors Handbook. Update to Exposure Factors Handbook. EPA/600/8-89/043 - May 1989. Office of Research and Development.

(6) USEPA, 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). EPA 540/1-89/002. Office of Emergency and Remedial Respose.

(7) Surface Area represented by hands, head, feet, forearms, and lower legs.

(8) USEPA, 1997. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Supplemental Guidance. Dermal Risk Assessment (Interim Guidance). EPA Region I.

(9) USEPA, 1995. Assessing Dermal Exposure from Soil. EPA Region III Technical Guidance Manual, EPA/903-K-95-003. December.

(10) Professional Judgement. 1 event per day.

(11) USEPA, 1996. Soil Screening Guidance. Users Guide. EPA 9355.4-23. Office of Solid Waste and Emergency Response.

(12) Professional Judgement. 8 hours per day of exposure based on an average workday.

A summary of the relevant non-cancer and cancer toxicological factors for the COPCs is presented in Tables 3-5, 3-6, 3-7, and 3-8. The toxicological factors for some surrogate chemicals were conservatively applied when other toxicological information was not available for a chemical, as noted on the tables.

The toxicities of the PAH compounds were evaluated using toxicity equivalency factors (TEFs). Benzo(a)pyrene is considered to be one of the most potent PAH carcinogens. As such, the toxicity of the other carcinogenic PAHs is typically expressed relative to the toxicity of benzo(a)pyrene through the use of a TEF. The TEF is the ratio of the toxicity of the carcinogenic PAH to the toxicity of benzo(a)pyrene. The TEFs for the carcinogenic PAHs are shown in the table below (USEPA, 1994). The slope factor used in the risk calculations for each carcinogenic PAH was the slope factor for benzo(a)pyrene multiplied by the TEF for that PAH. These calculated slope factors are shown on Table 3-7.

Detected PAHs	Toxicity Equivalency Factor
Benzo(a)pyrene	1.0
Benzo(b)fluoranthene	0.1
Dibenz(a,h)anthracene	1.0

3.6 Risk Characterization

Quantitative evaluation of risks involves combining exposure point concentrations, exposure scenarios, and toxicity values using methods defined by USEPA to calculate potential carcinogenic and non-carcinogenic risks. Potential health risks were calculated for the construction worker to assess exposures to contaminant levels in surface and subsurface soil along the planned route of the subsurface utilities in the parking lot area.

Chronic Daily Intakes (CDIs) for the construction worker were calculated for each ingestion, dermal absorption, and inhalation exposure pathway. The equations for calculating intake for each exposure pathway are shown on Table 3-4. CDIs are expressed as the amount of a chemical an individual would be exposed to per unit body weight per day (i.e., mg/kg-day). The CDIs are averaged over a lifetime (70 years) for carcinogens, and over the exposure duration for non-carcinogens (USEPA, 1989).

For non-carcinogens, exposure pathways were evaluated by comparing chemical-specific CDIs to their associated RfDs. Potential non-carcinogenic effects are evaluated as the ratio of the CDI to the RfD. The sum of all chemical-specific CDI/RfD ratios, which are referred to as Hazard Quotients (HQs), for the COPCs is called the Hazard Index (HI) and is calculated as shown below:

$$HI = \sum_{i=1}^{n} \frac{CDI_i}{RfD_i}$$

where:

CDI_i	=	Chronic daily intake for COPC i (mg/kg-day)
HI	=	Hazard Index (unitless)
n	=	Number of COPCs in each exposure medium (unitless)
RfD_i	=	Reference dose for COPC i (mg/kg-day)

An HI less than 1.0 is unlikely to be associated with adverse health effects and is therefore less likely to be of concern than an HI greater than 1.0. In addition, the effect/target organ-specific HIs were evaluated (which assumes that two chemicals that produce adverse effects on the same target organ are dose additive). Table 3-9 presents the EPC, intake value, RfD and individual hazard quotients for each exposure pathway for the construction worker.

TABLE 3-5

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units	(1)	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
4-Isopropyltoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene (2)	Chronic	3.0E-02	mg/kg-day	100%	3.0E-02	mg/kg-day	Kidney	3000	IRIS	08/25/03
Benzo(b)fluoranthene (2)	Chronic	3.0E-02	mg/kg-day	100%	3.0E-02	mg/kg-day	Kidney	3000	IRIS	08/25/03
Benzo(g,h,i)perylene (2)	Chronic	3.0E-02	mg/kg-day	100%	3.0E-02	mg/kg-day	Kidney	3000	IRIS	08/25/03
Dibenzo(a,h)anthracene (2)	Chronic	3.0E-02	mg/kg-day	100%	3.0E-02	mg/kg-day	Kidney	3000	IRIS	08/25/03
Phenanthrene (3)	Chronic	3.0E-01	mg/kg-day	100%	3.0E-01	mg/kg-day	None	3000	IRIS	08/25/03
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	3.0E-04	mg/kg-day	100%	3.0E-04	mg/kg-day	Skin	3	IRIS	08/25/03
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	1.4E-01	mg/kg-day	4%	5.6E-03	mg/kg-day	Nervous System	1	IRIS	08/25/03

Notes:

NA = Not Applicable

(1) USEPA, 2001b. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Interim.

(2) Pyrene used as a surrogate for toxicological values for benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, and dibenzo(a,h)anthracene.

(3) Anthracene used as a surrogate for toxicological values for phenanthrene.

TABLE 3-6

NON-CANCER TOXICITY DATA -- INHALATION

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
4-Isopropyltoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	5.0E-05	mg/m^3	1.4E-05	mg/kg-day	Nervous System	1000	IRIS	8/25/2003

Notes:

NA = Not Applicable

TABLE 3-7

CANCER TOXICITY DATA – ORAL/DERMAL

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units	(1)	Value	Units	(3)	Source(s)	Date(s) (MM/DD/YYYY)
4-Isopropyltoluene	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7.3E+00	$(mg/kg\text{-}day)^{-1}$	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	09/25/03
Benzo(b)fluoranthene (2)	7.3E-01	$(mg/kg\text{-}day)^{-1}$	100%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	09/25/03
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	D	IRIS	09/25/03
Dibenzo(a,h)anthracene (2)	7.3E+00	$(mg/kg\text{-}day)^{-1}$	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	09/25/03
Phenanthrene	NA	NA	NA	NA	NA	D	IRIS	09/25/03
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	(mg/kg-day)-1	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	09/25/03
Lead	NA	NA	NA	NA	NA	B2	IRIS	09/25/03
Manganese	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

(1) USEPA, 2001b. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment).

(2) Benzo(a)pyrene toxic equivalency factors applied to slope factor for benzo(b)fluoranthene, and dibenzo(a,h)anthracene.

(3) Weight of Evidence/Cancer Guideline Descriptions:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 3-8

CANCER TOXICITY DATA – INHALATION

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guideline Description (1)	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
4-Isopropyltoluene	NA	NA	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA
Aluminum	NA	NA	NA	NA	NA	NA	NA
Arsenic	4.3E+00	$(mg/m^3)^{-1}$	1.5E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	8/25/2003
Lead	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA

Notes:

(1) Weight of Evidence/Cancer Guideline Descriptions:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 3-9

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Soil	Incidental Ingestion	4-Isopropyltoluene	0.00044	mg/kg	5.7E-12	mg/kg-day	NA	NA	--	4.0E-10	mg/kg-day	NA	NA	--
				Iodomethane	0.000844	mg/kg	1.1E-11	mg/kg-day	NA	NA	--	7.6E-10	mg/kg-day	NA	NA	--
				Benzo(a)pyrene	0.216	mg/kg	2.8E-09	mg/kg-day	7.3E+00	(mg/kg-day)-1	2.0E-08	1.9E-07	mg/kg-day	3.0E-02	mg/kg-day	6.5E-06
				Benzo(b)fluoranthene	0.286	mg/kg	3.7E-09	mg/kg-day	7.3E-01	(mg/kg-day)-1	2.7E-09	2.6E-07	mg/kg-day	3.0E-02	mg/kg-day	8.6E-06
				Benzo(g,h,i)perylene	0.22	mg/kg	2.8E-09	mg/kg-day	NA	NA	--	2.0E-07	mg/kg-day	3.0E-02	mg/kg-day	6.6E-06
				Dibenzo(a,h)anthracene	0.066	mg/kg	8.5E-10	mg/kg-day	7.3E+00	(mg/kg-day)-1	6.2E-09	6.0E-08	mg/kg-day	3.0E-02	mg/kg-day	2.0E-06
				Phenanthrene	0.255	mg/kg	3.3E-09	mg/kg-day	NA	NA	--	2.3E-07	mg/kg-day	3.0E-01	mg/kg-day	7.7E-07
				Aluminum	12475	mg/kg	1.6E-04	mg/kg-day	NA	NA	--	1.1E-02	mg/kg-day	NA	NA	--
				Arsenic	9.27	mg/kg	1.2E-07	mg/kg-day	1.5E+00	(mg/kg-day)-1	1.8E-07	8.4E-06	mg/kg-day	3.0E-04	mg/kg-day	2.8E-02
				Lead	42	mg/kg	5.4E-07	mg/kg-day	NA	NA	--	3.8E-05	mg/kg-day	NA	NA	--
				Manganese	401	mg/kg	5.2E-06	mg/kg-day	NA	NA	--	3.6E-04	mg/kg-day	1.4E-01	mg/kg-day	2.6E-03
			Exp. Route Total								2.1E-07					3.0E-02
			Dermal Absorption	4-Isopropyltoluene	0.00044	mg/kg	N/A	N/A	NA	NA	--	N/A	N/A	NA	NA	--
				Iodomethane	0.000844	mg/kg	N/A	N/A	NA	NA	--	N/A	N/A	NA	NA	--
				Benzo(a)pyrene	0.216	mg/kg	4.2E-10	mg/kg-day	7.3E+00	(mg/kg-day)-1	3.1E-09	3.0E-08	mg/kg-day	3.0E-02	mg/kg-day	9.9E-07
				Benzo(b)fluoranthene	0.286	mg/kg	5.6E-10	mg/kg-day	7.3E-01	(mg/kg-day)-1	4.1E-10	3.9E-08	mg/kg-day	3.0E-02	mg/kg-day	1.3E-06
				Benzo(g,h,i)perylene	0.22	mg/kg	4.3E-10	mg/kg-day	NA	NA	--	3.0E-08	mg/kg-day	3.0E-02	mg/kg-day	1.0E-06
				Dibenzo(a,h)anthracene	0.066	mg/kg	1.3E-10	mg/kg-day	7.3E+00	(mg/kg-day)-1	9.4E-10	9.0E-09	mg/kg-day	3.0E-02	mg/kg-day	3.0E-07
				Phenanthrene	0.255	mg/kg	5.0E-10	mg/kg-day	NA	NA	--	3.5E-08	mg/kg-day	3.0E-01	mg/kg-day	1.2E-07
				Aluminum	12475	mg/kg	N/A	N/A	NA	NA	--	N/A	N/A	NA	NA	--
				Arsenic	9.27	mg/kg	4.2E-09	mg/kg-day	1.5E+00	(mg/kg-day)-1	6.3E-09	2.9E-07	mg/kg-day	3.0E-04	mg/kg-day	9.8E-04
				Lead	42	mg/kg	N/A	N/A	NA	NA	--	N/A	N/A	NA	NA	--
				Manganese	401	mg/kg	N/A	N/A	NA	NA	--	N/A	N/A	5.60E-03	mg/kg-day	--
			Exp. Route Total								1.1E-08					9.8E-04

TABLE 3-9

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Inhalation of Particulates	4-Isopropyltoluene	0.00044	mg/kg	2.4E-16	mg/kg-day	NA	NA	--	1.7E-14	mg/kg-day	NA	NA	--
				Iodomethane	0.000844	mg/kg	4.5E-16	mg/kg-day	NA	NA	--	3.2E-14	mg/kg-day	NA	NA	--
				Benzo(a)pyrene	0.216	mg/kg	1.2E-13	mg/kg-day	NA	NA	--	8.1E-12	mg/kg-day	NA	NA	--
				Benzo(b)fluoranthene	0.286	mg/kg	1.5E-13	mg/kg-day	NA	NA	--	1.1E-11	mg/kg-day	NA	NA	--
				Benzo(g,h,i)perylene	0.22	mg/kg	1.2E-13	mg/kg-day	NA	NA	--	8.3E-12	mg/kg-day	NA	NA	--
				Dibenzo(a,h)anthracene	0.066	mg/kg	3.5E-14	mg/kg-day	NA	NA	--	2.5E-12	mg/kg-day	NA	NA	--
				Phenanthrene	0.255	mg/kg	1.4E-13	mg/kg-day	NA	NA	--	9.6E-12	mg/kg-day	NA	NA	--
				Aluminum	12475	mg/kg	6.7E-09	mg/kg-day	NA	NA	--	4.7E-07	mg/kg-day	NA	NA	--
				Arsenic	9.27	mg/kg	5.0E-12	mg/kg-day	1.5E+01	(mg/kg-day)-1	7.5E-11	3.5E-10	mg/kg-day	NA	NA	--
				Lead	42	mg/kg	2.3E-11	mg/kg-day	NA	NA	--	1.3E-09	mg/kg-day	NA	NA	--
				Manganese	401	mg/kg	2.2E-10	mg/kg-day	NA	NA	--	1.5E-08	mg/kg-day	1.4E-05	mg/kg-day	1.1E-03
			Exp. Route Total								7.5E-11					1.1E-03
		Exposure Point Total									2.2E-07					3.3E-02
	Exposure Medium Total										2.2E-07					3.3E-02
Medium Total											2.2E-07					3.3E-02
										Total of Receptor Risks Across All Media	2.2E-07			Total of Receptor Hazards Across All Media		3.3E-02

The potential incremental lifetime cancer risk due to exposure to a specific carcinogenic compound is calculated by multiplying chemical-specific CDIs with their associated SFs. The sum of all chemical-specific CDI*SF products for the COPCs is called the Excess Lifetime Cancer Risk (ELCR) and is calculated as shown below:

$$ELCR = \sum_{i=1}^{n} CDI_i \cdot SF_i$$

where:

CDI_i	=	Chronic daily intake for COPC i (mg/kg-day)
ELCR	=	Excess lifetime cancer risk (unitless)
n	=	Number of COPCs in each exposure medium (unitless)
SF_i	=	Slope factor for COPC i $(mg/kg\text{-}day)^{-1}$

For the purposes of this assessment, cancer risks for exposure to multiple carcinogenic contaminants were assumed to be additive. USEPA has established that the acceptable target risk range is between $1x10^{-6}$ and $1x10^{-4}$. An ELCR below or within this range is unlikely to be associated with cancer effects and is less likely to be of concern than an ELCR exceeding this range. Table 3-9 presents the EPC, intake value, SF, and individual carcinogenic risks for each exposure pathway.

The results of the carcinogenic risk and HI calculations for each receptor are summarized on Table 3-10. Intake calculations are documented in Appendix B. The construction worker evaluated in the risk assessment was calculated to have an excess lifetime cancer risk (ELCR) of $2.2x10^{-7}$. This risk is lower than the most stringent endpoint of the USEPA's acceptable target risk range (i.e., 10^{-6} to 10^{-4} ELCR). The construction worker evaluated in this risk assessment was calculated to have a hazard index (HI) of 0.033, which is well below the USEPA's Threshold HI of 1.0.

3.7 Uncertainty Analysis

All risk assessments contain elements of uncertainty. Sources and characteristics of uncertainties are examined in this section to provide perspective for interpreting the results and level of conservatism inherent in the risk estimates and the underlying assumptions. The purpose of highlighting and discussing uncertainty is to assist in risk management decisions.

Most assumptions made in developing the risk estimates were by design biased toward health protectiveness, that is, toward overestimating rather than underestimating chemical exposure and risk. There is, therefore, a reasonable degree of certainty that actual risks to a construction worker exposed to site soil during construction will not be greater than those estimated in the risk assessment and are likely to be much lower. Specific uncertainties are highlighted below:

- The Adult Lead Model (USEPA, 2003a) was not used in this analysis to assess potential exposures to lead in soil because the duration/frequency of exposure of the construction worker to the site was less than the 90 days/year minimum required for the model to be valid. The Adult Lead Model estimates the blood lead levels in a fetus based on ingested contaminated soil lead levels by an expectant adult mother. It is highly unlikely that an expectant mother would be a construction worker installing utilities at the site. Total non-carcinogenic risks to the construction worker are not likely to be underestimated due to the lack of a detailed quantitative assessment of this COPC.

- Toxicological surrogates were used for a few of the COPCs. Use of the selected surrogates was designed to purposefully generate higher risk estimates than not considering those COPCs at all, and is conservative from that perspective. It is unknown how the toxicity of the assigned surrogates relates to the actual toxicity of the COPC that they represent.
- The background data considered for the site was the background data collected for the OFFTA, an area also within NAVSTA Newport. While the samples were not collected immediately adjacent to the SWOS parking lot area, the data would appear to be representative of background conditions in the local region. As the background data played a very limited role in this assessment (i.e., no chemicals were screened out based solely on the comparison to the background data), the impact of using these data rather than collecting additional samples closer to the site is minimal.

TABLE 3-19

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Soil	Soil	4-Isopropyltoluene	--	--	--	--	0.0E+00	NA	--	--	--	0.0E+00
			Iodomethane	--	--	--	--	0.0E+00	NA	--	--	--	0.0E+00
			Benzo(a)pyrene	2.0E-08	--	3.1E-09	--	2.3E-08	Kidney	6.5E-06	--	9.9E-07	7.5E-06
			Benzo(b)fluoranthene	2.7E-09	--	4.1E-10	--	3.1E-09	Kidney	8.6E-06	--	1.3E-06	9.9E-06
			Benzo(g,h,i)perylene	--	--	--	--	0.0E+00	Kidney	6.3E-06	--	1.0E-06	7.0E-06
			Dibenzo(a,h)anthracene	6.2E-09	--	9.4E-10	--	7.1E-09	Kidney	2.0E-06	--	3.0E-07	2.3E-06
			Phenanthrene	--	--	--	--	0.0E+00	None	7.7E-07	--	1.2E-07	8.8E-07
			Aluminum	--	--	--	--	0.0E+00	NA	--	--	--	0.0E+00
			Arsenic	1.8E-07	7.5E-11	6.3E-09	--	1.9E-07	Skin	2.3E-02	--	9.8E-04	2.3E-02
			Lead	--	--	--	--	0.0E+00	NA	--	--	--	0.0E+00
			Manganese	--	--	--	--	0.0E+00	Nervous System	2.3E-03	1.1E-03	--	3.6E-03
			Chemical Total	2.1E-07	7.5E-11	1.1E-08	0.0E+00	2.2E-07		3.0E-02	1.1E-03	9.8E-04	3.3E-02
		Exposure Point Total						2.2E-07					3.3E-02
	Exposure Medium Total							2.2E-07					3.3E-02
Medium Total								2.2E-07					3.3E-02
Receptor Total							Receptor Risk Total	2.2E-07				Receptor HI Total	3.3E-02

Total Kidney HI Across All Media =	2.7E-05
Total Skin HI Across All Media =	2.9E-02
Total Nervous System HI Across All Media =	3.6E-03

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Appendix A

Data Quality Review Details

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1.0 RESULTS

1.1 Holding Times

All analyses were performed within Method specified holding times.

1.2 Laboratory, Preparation and Trip Blanks

1.2.1 VOCs

Acetone is reported at 5 ug/Kg in the laboratory method blank for SDG B1235 and SDG B1229. All positive results for acetone in the samples of SDG B1235 and SDG B1229 less than 50 ug/Kg are qualified as non detect due to the potential false positives from laboratory contamination.

An equipment rinsate blank sample collected on 7/28/03 has a reported detection for methylene chloride (8 ug/L) and all positive results for methylene chloride should be qualified with a B for the potential of false positive results due to field cross contamination.

No trip blank samples were collected during this field event. The potential for cross contamination between samples during collecting and shipping cannot be determined. Since none of the VOC samples has very high levels of contamination reported the likelihood of cross contamination is determined to be minor there is no impact on the usability of the data.

1.2.2 SVOCs

Bis(2-ethylhexyl)phthalate is detected (89 ug/Kg) in the laboratory method blank for SDG B1235. All positive results less than 450 ug/Kg for samples in SDG B1235 are qualified as non-detect due to potential false positive results from laboratory contamination.

Bis(2-ethylhexyl)phthalate is detected (5 ug/L) in the equipment rinsate blank collected on July 28, 2003. Bis(2-ethylhexyl)phthlate is also detected in the aqueous (3 ug/L) and solid (49 ug/Kg) laboratory blank samples for SDG B1229. The equipment blank contamination is likely due to laboratory contamination and all samples with positive results for bis(2-ethylhexyl)phthalate should be qualified 'B' for blank contamination and all positive results < 250 ug/Kg should be qualified as non detect 'U' due to the potential for false positives from laboratory blank contamination.

1.3 Field and Laboratory Duplicate Precision

1.3.1 VOCs

The field duplicate (SWOS-1(1.5-3)) sample results do not meet criteria for reproducibility (<50% RPD). The RPD for detected compounds are 67% for methylene chloride, 143% for 2-butanone, and 67% for naphthalene. The results for methylene chloride, 2-butanone and naphthalane are qualified as estimated due to uncertainty in the reported results.

1.3.2 SVOCs

The field duplicate sample, SWOS-1(1.5-3), results did not meet criteria for reproducibility for fluoranthene (73.7%), pyrene (80%), benzo(a)anthracene (72.7%), chrysene (76.4%), benzo(b)fluoranthene (80.3%) and benzo(a)pyrene (78.3%). The results for these compounds in sample SWOS-1(1.5-3) should be qualified as estimated due to the uncertainty in the reported results.

1.3.3 PAHs

The field duplicate sample, SWOS-1(1.5-3), results did not meet criteria for reproducibility for pyrene (114.9%), benzo(a)anthracene (65.2%), benzo(b)fluoranthene (62.3%), benzo(k)fluoranthene (63.6%), benzo(a)pyrene (56.7%), indeno(1,2,3-cd)pyrene (68.9%), dibenz(a,h)anthracene (70.3%) and benzo(g,h,i)perylene (73.5%). The results for these compounds in sample SWOS-1(1.5-3) should be qualified as estimated due to the uncertainty in the reported results.

1.3.4 Metals

The laboratory duplicate results do not meet criteria for Lead (31.2%) and Silver (25.6%) in SDG B1235. All results for Lead and Silver in SDG B1235 are qualified as estimated due to uncertainty in the results. The results are usable for project purposes.

1.4 MS/MSD Recovery and Relative Percent Difference (RPD)

The following analytes did not meet criteria for recovery and/or reproducibility in the VOC matrix spike and matrix spike duplicate samples (SWOS-1(1.5-3)).

Table A-1
MS/MSD Recovery and Relative Percent Difference for VOCs

Compound	MS %R	MSD %R	RPD	Action
Dichlorofluoromethane	56			J
Chloromethane	123			J
Trichlorofluoromethane	62		43	J
Acetone	192	443	79	J
Methylene chloride	59			J
Methyl tert butyl ether	141	152		J
1,1-dichloroethane	123	130		J
2-butanone		200		J
Cis-1,2-dichloroethene		117		J
Bromochloromethane		135		J
Chloroform		126		J
1,2-dichloroethane		130		J
Bromodichloromethane	123			J
1,2-dichloropropane	128	139		J
Dibromomethane	128	135		J
Bromodichloromethane	120	130		J
1,1,2-trichloroethane	128	139		J
1,3-dichloropropane	144	161		J
2-hexanone	138	148		J
Dibromochloromethane	131	148		J
1,2-dibromoethane	128	135		J
1,1,1,2-tetrachloroethane	123	139		J
Bromoform		130		J
1,1,2,2-tetrachloroethane	195	217		J
Bromobenzene	126	135		J
1,2,3-trichloropropane	174	196		J
1,2-dibromo-3-chloropropane	141	152		J
Hexachlorobutadiene	44	52		J

1.4.1 SVOCs

The following analytes did not meet criteria for recovery and/or reproducibility in the SVOC matrix spike and matrix spike duplicate samples (SWOS-1(1.5-3)).

Table A-2
MS/MSD Recovery and Relative Percent Difference for SVOCs

Compound	MS %R	MSD %R	RPD	Action
4-chloro-3-methylphenol	53			J
2,4,5-trichlorophenol	51			J
2-nitroaniline	53			J
Dimethylphthalate	53			J
2,6-dinitrotoluene	58			J
4-nitrophenol	44			J
Dibenzofuran	58			J
2,4-dinitrotoluene	58		42	J
Diethylphthalate	58			J
4,6-dinitro-2-methylphenol	32			J
Dimethylphthalate		60		J
4-bromophenyl-phenylether	58	65		J
Hexachlorobenzene	63	65		J
Pentachlorophenol	12	18		J
Phenanathrene	60		49	J
di-n-butylphthalate	58	60		J
Fluoranthene	57			J
Pyrene	57		49	J
Butylbenzylphthalate	53	60		J
Bis(2-ethylhexyl)phthalate	54	61		J
di-n-octylphthalate	58			J
Benzo(b)fluoranthene	58			J
Benzo(a)pyrene	59			J
Indeno(1,2,3-cd)pyrene	53			J
Dibenzo(a,h)anthracene	48	55		J

1.4.2 PAHs

The recoveries of analytes in the MS and MSD samples for the PAH analysis were generally below criteria for all compounds. The reported results for sample SWOS-1(1.5-3) should be considered to be estimated to low bias, potential false negatives. The results are usable for project purposes.

1.4.3 Metals

Aluminum (32.7%) and Lead (68.0%) are recovered low in the matrix spike collected with the field samples. All sample results for SDG B1229 and B1235 are qualified as estimated due to potential low bias, possible false negatives, in the results due to matrix interference. The low bias does not impact the usability of the data.

1.5 Surrogate Standard Recoveries

1.5.1 VOCs

The following samples have more than one surrogate recovered outside of criteria.

Table A-3
Surrogate Standard Recoveries for VOCs

Sample	Surrogates Low	Surrogates High	Action
SWOS-4(1.5-3)	1	2	J(+)
SWOS-3(1.5-3)	0	3	J(+)
SWOS-1(1.5-3)	0	1	J(+)
SWOS-4(1.5-3)	1	2	J(+)
SWOS-3(1.5-3)	0	1	J(+)
SWOS-3(0-1.5)	0	1	J(+)
SWOS-6(0-1.5)	0	1	J(+)
SWOS-2(1.5-3)	0	1	J(+)
SWOS-10(0-1.5)	0	1	J(+)
SWOS-10(0-1.5)Re	0	1	J(+)

1.5.2 SVOCs

The following samples have more than 1 surrogate recovered outside of criteria.

Table A-4
Surrogate Standard Recoveries for SVOCs

Sample	Surrogates Low	Surrogates High	Action
SWOS-6(1.5-3)	3		J
SWOS-5(1.5-3)	2		J

1.5.3 Pesticides

The following samples have surrogates recovered outside of criteria.

Table A-5
Surrogate Standard Recoveries for Pesticides

Sample	Tetrachloro-m-xylene	Decachlorobiphenyl	Action
SWOS-5(1.5-3)		1 low	J
SWOS-4(1.5-3)		1 low	J
SWOS-3(0-1.5)		1 high	J(+)
SWOS-9(1.5-3)		2 high	J(+)
SWOS-8(1.5-3)	1 high		J(+)
SWOS-2(0-1.5)		1 high	J(+)
SWOS-1(1.5-3)		2 low	J

1.5.4 PCBs

The following samples have surrogates recovered outside of criteria.

Table A-6
Surrogate Standard Recoveries for PCBs

Sample	Tetrachloro-m-xylene	Decachlorobiphenyl	Action
SWOS-9(1.5-3)		2 high	J(+)

1.6 Laboratory Control Samples

1.6.1 VOCs

The following analytes did not meet criteria for recovery in the VOC laboratory control samples.

Table A-7
Laboratory Control Samples for VOCs

LCS	Analytes	Recovery	Limits	Action	Samples Affected
V2WLCS	Cis-1,2-dichloroethene	116		J	SWOS-8(1.5-3) SWOS-7(1.5-3) SOWS-6(0-1.5) SWOS-6(1.5-3) SWOS-2(0-1.5) SWOS-2(1.5-3) Field Dup
V2ZLCSD	1,2-dichloropropane	118		J	

1.6.2 SVOCs

The analytes in Table A-8 did not meet criteria for recovery in the SVOC laboratory control samples.

1.6.3 PAHs

Naphthalene (46%), fluorene (46%) and fluoranthene (48%) were recovered low in the laboratory control sample analyzed with the field equipment rinsate blank. The non detect results for naphthalane, fluorene and fluoranthene are considered to be estimated due to potential low bias, false negatives. The results are considered to be usable for project purposes.

1.6.4 Pesticides

The recovery of delta-BHC (31%) did not meet method criteria. The reported result for delta-BHC in sample SWOS-1(1.5-3) should be considered as estimated due to potential low bias, possible false negative. The result is usable for project purposes.

1.6.5 Metals

Silver (120.2%) was recovered above criteria for a laboratory control sample analyzed with the SDG B1235. All positive reported results for silver for samples in SDG B1235 are qualified as estimated due to the potential high bias, false positive results. The results are usable for project purposes.

Table A-8
Laboratory Control Samples for SVOCs

LCS	Analytes	Recovery	Limits	Action	Samples Affected
S4ZLCS	2-nitroaniline	59		J	SWOS-9(0-1.5)
	4-bromophenyl-phenylether	59		J	SWOS-10(0-1.5) SWOS-10(1.5-3)
	Hexachlorobenzene	65		J	SWOS-8(0-1.5)
	di-n-butylphthalate	57		J	
	Pyrene	65		J	
	Butylbnzylphthalate	54		J	
	Bis(2-ethylhexyl)phthalate	55		J	
	di-n-octylphthalate	53		J	
S2FLCS	2,4-Dinitrophenol	0		R	SWOS-2(0-1.5)
	4,6-dinitro-2-methylphenol	16		J	SWOS-7(0-1.5)
	di-n-octylphthalate	65		J	SWOS-2(1.5-3) SWOS-1(1.5-3) SWOS-8(1.5-3) SWOS-6(1.5-3) SWOS-6(0-1.5) SWOS-3(0-1.5) SWOS-3(1.5-3) SWOS-5(1.5-3) SWOS-4(1.5-3) SWOS-7(1.5-3) SWOS-1(0-1.5) SWOS-4(0-1.5) SWOS-5(0-1.5)
S2MLCS	4,6-dinitro-2-methylphenol	28		J	SWOS-9(1.5-3) SWOS-7(1.5-3) SWOS-1(0-1.5) SWOS-4(0-1.5) SWOS-5(0-1.5)
S2MLCSD	2,4-dinitrophenol	6		R	SWOS-9(1.5-3)
	4,6-dinitro-2-methylphenol	17		J	SWOS-7(1.5-3) SWOS-1(0-1.5) SWOS-4(0-1.5) SWOS-5(0-1.5)

1.7 Internal Standard Areas

1.7.1 VOCs

The following samples did not have internal standard (IS) responses that met method criteria for the VOC analysis.

Table A-9
Internal Standard Areas for VOCs

Samples	IS High (>200%)	IS Low (< 50%)	Action
SWOS-5(1.5-3)		3	J
SWOS-4(0-1.5)		1	J
SWOS-4(1.5-3)		3	J
SWOS-3(0-1.5)		2	J
SWOS-3(1.5-3)		3	J
SWOS-9(1.5-3)		2	J
SWOS-8(1.5-3)		3	J
SWOS-7(1.5-3)		2	J
SWOS-6(0-1.5)		3	J
SWOS-2(1.5-3)		3	J
SWOS-1(1.5-3)	1		J(+)
FIELD DUP	1		J(+)
SWOS-5(0-1.5)		2	J
SWOS-4(1.5-3)		3	J
SWOS-3(1.5-3)		1	J
SWOS-8(1.5-3)		3	J

1.7.2 SVOCs

The following samples did not have internal standard responses that met method criteria for the SVOC analysis.

Table A-10
Internal Standard Areas for SVOCs

Samples	IS High (>200%)	IS Low (< 50%)	Action
SWOS-4(0-1.5)		1	J
SWOS-5(0-1.5)		2	J

1.8 PCB and Pesticide Target Compound Identification

The following compounds do not meet criteria for precision between analytical column results.

Table A-11
PCB and Pesticide Target Compound identification

Sample	Analyte	% D	Action
SWOS-4(1.5-3)	Aldrin	117.5	J
SWOS-6(0-1.5)	4,4-DDE	48.3	J
SWOS-6(1.5-3)	4,4-DDE	66.7	J
SWOS-9(1.5-3)	4,4-DDE	32.2	J
	Alpha-chlordane	42.8	J
	Gamma-chlordane	41.5	J
SWOS-8(0-1.5)	4,4'-DDE	37	J

1.8.1 ICP Serial Dilutions

The serial dilution sample for SDG B1235 does not meet criteria for Barium (12.9%), Cadmium (33.6%), Cobalt (10.6%), Lead (10.8%), Magnesium (11.0%), Manganese (11.1%) and Zinc (12.9%). All results for Barium, Cadmium, Cobalt, Lead, Magnesium, Manganese and Zinc are qualified as estimated due to uncertainty in the results.

Appendix B
Intake Calculations for the Construction Worker Soil Exposures

Table: B-1
Site: SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND
Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Receptor Population: Construction Worker
Receptor Age: Adult
Exposure Route: Incidental Ingestion

INTAKE = mg/kg-day	Exposure Point Concentration in Soil	X	Soil Ingestion Rate	X	Exposure Frequency	X	Exposure Duration	X	Conversion Factor 1	X	1 / Body Weight	X	1 / Averaging Time-Cancer

Variable Symbols =	CS	IR-S	EF	ED	CF1	BW	AT-C
Parameter Values =	Site-Specific	480	48	1	1.E-06	70	25,550
Parameter Units =	mg/kg	mg/day	days/year	years	kg/mg	kg	days

Exposure Point	Chemical of Concern	Exposure Point Concentration in Soil mg/kg	Soil Ingestion Rate mg/day	Exposure Frequency days/year	Exposure Duration years	Conversion Factor 1 kg/mg	Body Weight kg	Averaging Time-Cancer days	INTAKE mg/kg-day
Soil	4-Isopropyltoluene	0.00044	480	48	1	1.E-06	70	25,550	5.7E-12
	Iodomethane	0.000844	480	48	1	1.E-06	70	25,550	1.1E-11
	Benzo(a)pyrene	0.216	480	48	1	1.E-06	70	25,550	2.8E-09
	Benzo(b)fluoranthene	0.286	480	48	1	1.E-06	70	25,550	3.7E-09
	Benzo(g,h,i)perylene	0.22	480	48	1	1.E-06	70	25,550	2.8E-09
	Dibenzo(a,h)anthracene	0.066	480	48	1	1.E-06	70	25,550	8.5E-10
	Phenanthrene	0.255	480	48	1	1.E-06	70	25,550	3.3E-09
	Aluminum	12475	480	48	1	1.E-06	70	25,550	1.6E-04
	Arsenic	9.27	480	48	1	1.E-06	70	25,550	1.2E-07
	Lead	42	480	48	1	1.E-06	70	25,550	5.4E-07
	Manganese	401	480	48	1	1.E-06	70	25,550	5.2E-06

Table: 3-2
Site: SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND
Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Receptor Population: Construction Worker
Receptor Age: Adult
Exposure Route: Dermal Absorption

INTAKE = mg/kg-day	Exposure Point Concentration in Soil	X	Skin Surface Area Available for Contact	X	Dermal Absorption Factor (Solid)	X	Soil to skin adherence factor	X	Exposure Frequency	X	Exposure Duration	X	Conversion Factor 1	X	1 / Body Weight	X	1 / Averaging Time-Cancer

Variable Symbols =	CS	SA	DABS	SSAF	EF	ED	CF1	BW	AT-C
Parameter Values =	Site-Specific	7,014	Chemical-Specific	0.08	48	1	1.E-06	70	25,550
Parameter Units =	mg/kg	cm2/day	unitless	mg/cm2	days/year	years	kg/mg	kg	days

Exposure Point	Chemical of Concern	Exposure Point Concentration in Soil mg/kg	Skin Surface Area Available for Contact cm2/day	Dermal Absorption Factor (Solid) unitless	Soil to skin adherence factor mg/cm2	Exposure Frequency days/year	Exposure Duration years	Conversion Factor 1 kg/mg	Body Weight kg	Averaging Time-Cancer days	INTAKE mg/kg-day
Soil	4-Isopropyltoluene	0.00044	7,014	N/A	0.08	48	1	1.E-06	70	25,550	N/A
	Iodomethane	0.000844	7,014	N/A	0.08	48	1	1.E-06	70	25,550	N/A
	Benzo(a)pyrene	0.216	7,014	0.13	0.08	48	1	1.E-06	70	25,550	4.2E-10
	Benzo(b)fluoranthene	0.286	7,014	0.13	0.08	48	1	1.E-06	70	25,550	5.6E-10
	Benzo(g,h,i)perylene	0.22	7,014	0.13	0.08	48	1	1.E-06	70	25,550	4.3E-10
	Dibenzo(a,h)anthracene	0.068	7,014	0.13	0.08	48	1	1.E-06	70	25,550	1.3E-10
	Phenanthrene	0.255	7,014	0.13	0.08	48	1	1.E-06	70	25,550	5.0E-10
	Aluminum	12475	7,014	N/A	0.08	48	1	1.E-06	70	25,550	N/A
	Arsenic	9.27	7,014	0.03	0.08	48	1	1.E-06	70	25,550	4.2E-09
	Lead	42	7,014	N/A	0.08	48	1	1.E-06	70	25,550	N/A
	Manganese	401	7,014	N/A	0.08	48	1	1.E-06	70	25,550	N/A

Notes:
N/A - Not Applicable

Table: B-3
Site: SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND
Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Receptor Population: Construction Worker
Receptor Age: Adult
Exposure Route: Inhalation

$$\text{INTAKE} = \text{Exposure Point Concentration in Soil} \times \frac{1}{\text{Particulate Emission Factor}} \times \text{Inhalation Rate} \times \text{Exposure Time} \times \text{Exposure Frequency} \times \text{Exposure Duration} \times \frac{1}{\text{Body Weight}} \times \frac{1}{\text{Averaging Time-Cancer}}$$

INTAKE = mg/kg-day

Variable Symbols =	CS	PEF	IN	ET	EF	ED	BW	AT-C
Parameter Values =	Site-Specific	1.32E+09	3.3	8	48	1	70	25,550
Parameter Units =	mg/kg	m3/kg	m3/hr	hour/day	days/year	years	kg	days

Exposure Point	Chemical of Concern	Exposure Point Concentration in Soil mg/kg	Particulate Emission Factor m3/kg	Inhalation Rate m3/hr	Exposure Time hour/day	Exposure Frequency days/year	Exposure Duration years	Body Weight kg	Averaging Time-Cancer days	INTAKE mg/kg-day
Soil	4-isopropyltoluene	0.00044	1.3E+09	3.3	8	48	1	70	25,550	2.4E-16
	Iodomethane	0.000844	1.3E+09	3.3	8	48	1	70	25,550	4.6E-16
	Benzo(a)pyrene	0.216	1.3E+09	3.3	8	48	1	70	25,550	1.2E-13
	Benzo(b)fluoranthene	0.286	1.3E+09	3.3	8	48	1	70	25,550	1.5E-13
	Benzo(g,h,i)perylene	0.22	1.3E+09	3.3	8	48	1	70	25,550	1.2E-13
	Dibenzo(a,h)anthracene	0.066	1.3E+09	3.3	8	48	1	70	25,550	3.5E-14
	Phenanthrene	0.255	1.3E+09	3.3	8	48	1	70	25,550	1.4E-13
	Aluminum	12475	1.3E+09	3.3	8	48	1	70	25,550	6.7E-09
	Arsenic	9.27	1.3E+09	3.3	8	48	1	70	25,550	5.0E-12
	Lead	42	1.3E+09	3.3	8	48	1	70	25,550	2.3E-11
	Manganese	401	1.3E+09	3.3	8	48	1	70	25,550	2.2E-10

Table: B-4
Site: SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND
Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Receptor Population: Construction Worker
Receptor Age: Adult
Exposure Route: Incidental Ingestion

INTAKE = mg/kg-day	Exposure Point Concentration in Soil	X	Soil Ingestion Rate	X	Exposure Frequency	X	Exposure Duration	X	Conversion Factor 1	X	1 / Body Weight	X	1 / Averaging Time-Non-Cancer

Variable Symbols =	CS	IR-S	EF	ED	CF1	BW	AT-N
Parameter Values =	Site-specific	480	48	1	1.E-06	70	365
Parameter Units =	mg/kg	mg/day	days/year	years	kg/mg	kg	days

Exposure Point	Chemical of Concern	Exposure Point Concentration in Soil mg/kg	Soil Ingestion Rate mg/day	Exposure Frequency days/year	Exposure Duration years	Conversion Factor 1 kg/mg	Body Weight kg	Averaging Time-Non-Cancer days	INTAKE mg/kg-day
Soil	4-Isopropyltoluene	0.00044	480	48	1	1.E-06	70	365	4.0E-10
	Iodomethane	0.000844	480	48	1	1.E-06	70	365	7.8E-10
	Benzo(a)pyrene	0.216	480	48	1	1.E-06	70	365	1.9E-07
	Benzo(b)fluoranthene	0.286	480	48	1	1.E-06	70	365	2.6E-07
	Benzo(g,h,i)perylene	0.22	480	48	1	1.E-06	70	365	2.0E-07
	Dibenzo(a,h)anthracene	0.066	480	48	1	1.E-06	70	365	6.0E-08
	Phenanthrene	0.255	480	48	1	1.E-06	70	365	2.3E-07
	Aluminum	12475	480	48	1	1.E-06	70	365	1.1E-02
	Arsenic	9.27	480	48	1	1.E-06	70	365	8.4E-06
	Lead	42	480	48	1	1.E-06	70	365	3.8E-05
	Manganese	401	480	48	1	1.E-06	70	365	3.6E-04

Table: D-5
Site: SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND
Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Receptor Population: Construction Worker
Receptor Age: Adult
Exposure Route: Dermal Absorption

INTAKE = mg/kg-day	Exposure Point Concentration in Soil	X	Skin Surface Area Available for Contact	X	Dermal Absorption Factor (Solid)	X	Soil to skin adherence factor	X	Exposure Frequency	X	Exposure Duration	X	Conversion Factor 1	X	1 / Body Weight	X	1 / Averaging Time-Non-Cancer

Variable Symbols =	CS	SA	DABS	SSAF	EF	ED	CF1	BW	AT-N	
Parameter Values =	Site-specific	7,014	Chemical-specific	0.08	48	1	1.E-06	70	365	
Parameter Units =	mg/kg	cm2/day	unitless	mg/cm2	days/year	years	kg/mg	kg	days	

Exposure Point	Chemical of Concern	Exposure Point Concentration in Soil mg/kg	Skin Surface Area Available for Contact cm2/day	Dermal Absorption Factor (Solid) unitless	Soil to skin adherence factor mg/cm2	Exposure Frequency days/year	Exposure Duration years	Conversion Factor 1 kg/mg	Body Weight kg	Averaging Time-Non-Cancer days	INTAKE mg/kg-day
Soil	4-Isopropyltoluene	0.00044	7,014	N/A	0.08	48	1	1.E-06	70	365	N/A
	Iodomethane	0.000844	7,014	N/A	0.08	48	1	1.E-06	70	365	N/A
	Benzo(a)pyrene	0.216	7,014	0.13	0.08	48	1	1.E-06	70	365	3.0E-08
	Benzo(b)fluoranthene	0.236	7,014	0.13	0.08	48	1	1.E-06	70	365	3.3E-08
	Benzo(g,h,i)perylene	0.22	7,014	0.13	0.08	48	1	1.E-06	70	365	3.0E-08
	Dibenzo(a,h)anthracene	0.056	7,014	0.13	0.08	48	1	1.E-06	70	365	9.0E-09
	Phenanthrene	0.255	7,014	0.13	0.08	48	1	1.E-06	70	365	3.5E-08
	Aluminum	12475	7,014	N/A	0.08	48	1	1.E-06	70	365	N/A
	Arsenic	9.27	7,014	0.03	0.08	48	1	1.E-06	70	365	2.9E-07
	Lead	42	7,014	N/A	0.08	48	1	1.E-06	70	365	N/A
	Manganese	401	7,014	N/A	0.08	48	1	1.E-06	70	365	N/A

Notes:
N/A - Not Applicable

Table: B-6
Site: SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND
Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil
Receptor Population: Construction Worker
Receptor Age: Adult
Exposure Route: Inhalation

$$\text{INTAKE (mg/kg-day)} = \text{Exposure Point Concentration in Soil} \times \frac{1}{\text{Particulate Emission Factor}} \times \text{Inhalation Rate} \times \text{Exposure Time} \times \text{Exposure Frequency} \times \text{Exposure Duration} \times \frac{1}{\text{Body Weight}} \times \frac{1}{\text{Averaging Time-Non-Cancer}}$$

Variable Symbols =	CS	PEF	IN	ET	EF	ED	BW	AT-N
Parameter Values =	Site-Specific	1.32E+09	3.3	8	48	1	70	365
Parameter Units =	mg/kg	m3/kg	m3/hr	hour/day	days/year	years	kg	days

Exposure Point	Chemical of Concern	Exposure Point Concentration in Soil mg/kg	Particulate Emission Factor m3/kg	Inhalation Rate m3/hr	Exposure Time hour/day	Exposure Frequency days/year	Exposure Duration years	Body Weight kg	Averaging Time-Non-Cancer days	INTAKE mg/kg-day
Soil	4-Isopropyltoluene	0.00044	1.3E+09	3.3	8	48	1	70	365	1.7E-14
	Iodomethane	0.000844	1.3E+09	3.3	8	48	1	70	365	3.2E-14
	Benzo(a)pyrene	0.216	1.3E+09	3.3	8	48	1	70	365	8.1E-12
	Benzo(b)fluoranthene	0.286	1.3E+09	3.3	8	48	1	70	365	1.1E-11
	Benzo(g,h,i)perylene	0.22	1.3E+09	3.3	8	48	1	70	365	8.3E-12
	Dibenzo(a,h)anthracene	0.066	1.3E+09	3.3	8	48	1	70	365	2.5E-12
	Phenanthrene	0.255	1.3E+09	3.3	8	48	1	70	365	9.6E-12
	Aluminum	12475	1.3E+09	3.3	8	48	1	70	365	4.7E-07
	Arsenic	9.27	1.3E+09	3.3	8	48	1	70	365	3.5E-10
	Lead	42	1.3E+09	3.3	8	48	1	70	365	1.6E-09
	Manganese	401	1.3E+09	3.3	8	48	1	70	365	1.5E-08

Table: B-7
Chemical-Specific Factors
Site: SWOS SITE, NAVAL STATION NEWPORT, PORTSMOUTH, RHODE ISLAND

Chemical Group	Chemical of Concern	Dermal Absorption Fraction (1) unitless
	4-isopropyltoluene	N/A
	Iodomethane	N/A
	Benzo(a)pyrene	0.13
	Benzo(b)fluoranthene	0.13
	Benzo(g,h,i)perylene	0.13
	Dibenzo(a,h)anthracene	0.13
	Phenanthrene	0.13
	Aluminum	N/A
	Arsenic	0.03
	Lead	N/A
	Manganese	N/A

Sources:
(1) USEPA, 2001. Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Interim Guidance. - Exhibit 3.4.

Mueller, Cornelia GS (NSNPT N8N)

From: TKelly@TtFWI.com
Sent: Friday, September 05, 2003 3:36 PM
To: hellandbj@efane.navfac.navy.mil; boberta@efane.navfac.navy.mil; daviscm@efane.navfac.navy.mil; hutchisonak@efane.navfac.navy.mil; krivinskasrx@efane.navfac.navy.mil; muellerc@nsnpt.navy.mil; coonsd@nehc.med.navy.mil
Cc: SLeach@TtFWI.com; jmcintosh@TtFWI.com; AChou@TtFWI.com; KCraigie@TtFWI.com; RMarnicio@TtFWI.com
Subject: Submittal: CTO-93-06 Final Report and Risk Assessment for Worker Exposure at the SWOS Site

TO-93-06 (File 01 of 02) Tran... TO-93-06 (File 02 of 02) Fina...

To All: Attached below are the files for Submittal CTO-93-06 Final Report and Risk Assessment for Worker Exposure at the SWOS Site - (Naval Station Newport - Portsmouth, RI).

1. Transmittal Form

(See attached file: CTO-93-06 (File 01 of 02) Transmittal Form.pdf)

2. Final Report and Risk Assessment for Worker Exposure at the SWOS Site

(See attached file: CTO-93-06 (File 02 of 02) Final Report and Risk Assessment for Worker Exposure at the SWOS Site.pdf)

If you have any questions or require additional information, you can E-mail me or call me at 215-702-4067.

NOTE: My E-Mail address has changed from tkelly@fwenc.com to tkelly@ttfwi .com

Tom

Mueller, Cornelia GS (NSNPT N8N)

From: jmcintosh@TtFWI.com
Sent: Thursday, September 04, 2003 3:09 PM
To: Davisom@efdnorth.navfac.navy.mil; boberta@efane.navfac.navy.mil; Hellandbj@efane.navfac.navy.mil
Cc: KrivinskasRX@efane.navfac.navy.mil; Mueller, Cornelia GS (NSNPT N8N); SLeach@TtFWI.com
Subject: CTO 93 Final Report and Risk Assessment for Construction Worker Exposure for submittal

0931_A003-Fig1-1.pdf (689 KB) ND03-099_Fig1-2.pdf (169 KB) D03-099_Table1-1.xls (83 KB) ND03-099_Tables 3-5 thru 3-8.x... D03-099_App_A.doc (272 KB) ND03-099_App_B_intake ca.xls (... ND03-099_App_B_intake nc.xls (...

ND03-099_Table 3-1.xls (16 KB)... ND03-099_Table 3-10.xls (56 KB... ND03-099_Table 3-2.xls (41 KB)... ND03-099_Table 3-3.xls (22 KB)... ND03-099_Table 3-4.xls (24 KB)... ND03-099_Table 3-9.xls (59 KB)... D03-099.doc (307 KB)

I have attached the CTO 93 Final Report and Risk Assessment for Construction Worker Exposure. It will officially be submitted tomorrow or Monday, September 8th.

Thanks,
Janice
T: 617-457-8411

(See attached file: 0931_A003-Fig1-1.pdf)(See attached file: ND03-099_Fig1-2.pdf)(See attached file: ND03-099_Table1-1.xls)(See attached file: ND03-099_Tables 3-5 thru 3-8.xls)(See attached file: ND03-099_App_A.doc)(See attached file: ND03-099_App_B_intake ca.xls)(See attached file: ND03-099_App_B_intake nc.xls) (See attached file: ND03-099_Table 3-1.xls)(See attached file: ND03-099_Table 3-10.xls)(See attached file: ND03-099_Table 3-2.xls)(See attached file: ND03-099_Table 3-3.xls)(See attached file: ND03-099_Table 3-4.xls)(See attached file: ND03-099_Table 3-9.xls)(See attached file: ND03-099.doc)