

HEALTH AND SAFETY PLAN – R vision 2

**INSTALLATION RESTORATION (IR) SITE 08, NUSC
DISPOSAL AREA SOIL REMOVAL ACTION
NAVAL UNDERSEA WARFARE CENTER, MIDDLETOWN, RI**

CONTRACT NO: N62472-01-D-0807 DELIVERY ORDER NO 006



**Prepared for:
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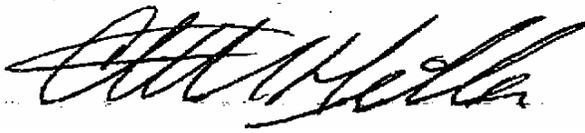
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May 2005

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May 19, 2005

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TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 Purpose	1
1.2 Scope of the HASP	1
1.3 Regulatory Authority	2
2.0 KEY PERSONNEL AND PERSONNEL RESPONSIBILITIES.....	3
2.1 Project Manager.....	3
2.2 Construction Superintendent	3
2.3 TN&A Corporate Health and Safety Manager	3
2.4 Site Health & Safety Officer	4
2.5 Employees	4
2.6 Visitors.....	4
2.7 Work Stoppage Authority.....	5
3.0 SITE DESCRIPTION	6
3.1 Site History	6
3.2 Site Status	7
4.0 HAZARD IDENTIFICATION AND ANALYSIS	8
4.1 Summary of Site Field Activities	8
4.2 Summary of Activity Hazard Analysis (General)	9
4.3 Physical Hazards.....	9
4.3.1 Heat Stress	9
4.3.2 Heavy Equipment Operation	21
4.3.3 Noise Hazards.....	22
4.3.4 Proper Lifting Procedures.....	24
4.3.5 Hazards Associated with Excavating and Handling Unknown Drums	24
4.4 Biological Hazards	25
4.4.1 Hazardous Flora.....	26
4.4.2 Hazardous Fauna	26
4.4.3 Radiation Hazards.....	27
4.4.4 Explosion and Fire.....	28
4.4.5 Potential Chemical Hazards.....	28
5.0 TRAINING	33
5.1 Introduction	33
5.2 Basic Safety Training	33
5.3 Refresher Training.....	33
5.4 Supervisory Training.....	33
5.5 Safety-Orientation Briefing.....	33
5.6 Daily Safety Briefings	34

5.7	Hazard Communication.....	34
5.8	Subcontractor Training.....	34
5.9	Visitor’s Briefing.....	35
5.10	Heavy Equipment Operator’s License	35
6.0	PERSONAL PROTECTIVE EQUIPMENT.....	36
6.1	Mobilization and Site Preparation	36
6.2	Buried Drum Area Excavation and Drum Handling, Drum Overpacking and Sampling	36
6.3	Buried Metal Container Area Excavation	36
6.4	Backfill and Topsoil Placement.....	37
6.5	Excavated Soil and Debris Sampling	37
6.6	Soil and Debris Loadout.....	37
6.7	Site Restoration and Demobilization.....	37
7.0	MEDICAL SURVEILLANCE PROGRAM.....	38
7.1	Purpose	38
7.2	Medical Evaluation.....	38
7.3	Annual Examination	39
7.4	Employee Notification of Medical Examination Results	39
7.5	Lost-Time Injuries/Illnesses	39
7.6	Records	39
8.0	EXPOSURE MONITORING AND AIR MONITORING PROGRAM..	40
8.1	General.....	40
8.2	Direct-Reading Monitoring Instruments	40
8.3	Air Monitoring and Action Levels	41
8.3.1	Organic Vapors.....	41
8.3.2	Industrial Hygiene Exposure Monitoring	43
8.4	Data Logging and Record Keeping	44
8.5	Work Stoppages.....	44
8.6	Calibration Procedures	44
8.7	Field Data Sheets and Logs	45
9.0	STANDARD OPERATING SAFETY PROCEDURES AND CONTROLS.....	46
9.1	Personal Precautions.....	46
9.2	Operational Requirements	46
9.2.1	General Requirements for All Levels.....	46
9.2.2	Requirements for Level C.....	47
9.3	Subcontractor Safety and Health Plans	47
10.0	SITE CONTROL MEASURES.....	48
10.1	General	48
10.2	Work Zone Definitions and Site Security	48
11.0	PERSONAL HYGIENE AND DECONTAMINATION	50
11.1	General	50
11.2	Donning Personal Protective Equipment	50

11.3	Doffing Personal Protective Equipment.....	50
11.4	Personal Hygiene/Sanitation	50
11.5	Medical Emergency Decontamination Procedures	51
12.0	EQUIPMENT DECONTAMINATION	53
12.1	Levels of Protection	53
12.2	Temporary Decon Pad.....	53
13.0	EMERGENCY RESPONSE AND CONTINGENCY PLAN.....	54
13.1	Introduction	54
13.2	Emergency Phone Numbers and Incident Report	54
13.3	Emergency Medical Care	54
13.3.1	First Aid.....	54
13.3.2	Blood Decontamination.....	54
13.3.3	Emergency Response Coordinator	54
13.4	Medical Providers	55
13.5	Lost-Time Injuries/Illnesses.....	55
13.6	Lines of Communication.....	55
13.6.1	Emergency Response Coordinator	55
13.6.2	Emergency Warning Systems.....	56
13.7	Evacuation Plan.....	56
13.8	Emergency Prevention, Recognition and Response.....	58
13.8.1	Emergency Equipment	59
13.9	Fire/Explosion	59
13.10	Environmental Release	60
13.11	NUWC HERO Emissions Control.....	60
13.12	Miscellaneous	61
13.13	Incident Reporting	61
13.14	ROICC Notification.....	61
13.15	Daily Pre-Work Meetings.....	61
13.16	Emergency Telephone Numbers.....	63
13.17	Incident Reporting Call List.....	64
14.0	LOGS, REPORTS, AND RECORDKEEPING	65
14.1	Exclusion Zone Entry Log	65
15.0	HAZARD COMMUNICATION	66
15.1	Container Labeling.....	66
15.2	Material Safety Data Sheets	66
15.3	Employee Training and Information	66
16.0	EXCAVATION PLAN	67
16.1	Purpose and Scope	67
16.2	Excavations and Trenches.....	67
16.2.1	Permits.....	67
16.2.2	Dig Alert.....	67
16.2.3	Cave-In Protection.....	67
16.2.4	Daily Inspections.....	67

Naval Facilities Engineering Command - Northeast
IR Site 08 – NUSC Disposal Area Soil Removal Action, Naval Undersea Warfare Center, Middletown, RI
Health and Safety Plan Revision 2

16.2.5	Egress.....	67
16.2.6	Backfill	68
16.2.7	Housekeeping	68
16.2.8	Excavation Perimeter Protection	68
16.2.9	Encroachment	68
16.3	Planned Excavation Activities	68
16.3.1	Buried Drum Area	68
16.3.2	Buried Metal Container Area	69
16.3.3	Soil and Debris Staging Area	70
16.4	Excavation and Soil/Debris Handling Hazards.....	70
16.4.1	Control of Excavation and Soil/debris Handling Hazards.....	70
16.4.2	High-Visibility Safety Vest	70
16.4.3	Communication	71
16.4.4	Open Excavations.....	71
17.0	LEAD CONTROL PLAN.....	72
17.1	Lead Hazards.....	72
17.2	Control of Lead Hazards	72
17.3	Air Sampling and Monitoring	73
18.0	HAZARDOUS ENERGY CONTROL PLAN	75
18.1	Electrical and Utility Hazards	75
18.1.1	Lockout/Tagout Exceptions.....	75
18.1.2	Energy Control Program.....	76
18.1.3	Lockout/Tagout Procedure	76
18.1.4	Periodic Inspection	78
18.1.5	Training and Communication.....	78
18.1.6	Material and Hardware	79
18.1.7	Employee Unavailable to Remove Lockout/Tagout	79
18.1.8	Outside Contractors	79
18.1.9	Group Lockout/Tagout	79
19.0	SEVERE WEATHER PLAN	81
20.0	ALCOHOL AND DRUG ABUSE PLAN	82
21.0	REFERENCES	83

LIST OF TABLES AND FIGURES

Table 4-1	– Activity Hazard Analysis Summary
Table 4-2	– Wind Chill Temperature Table (Section 4.3.1)
Table 4-3	– Time To Occurrence of Frostbite in Minutes or Hours. (Section 4.3.1)
Table 4-4	– Permissible Exposure Limits for Noise (Section 4.3.4)
Table 4-5	– Buried Drum Area Test Pit Results (Section 4.4.3)
Table 4-6	– Buried Metal Container Area Test Pit Results (Section 4.4.3)
Table 8.1	– Monitoring Methods and Action Levels for Uncharacterized ^a Mixtures Using Screening Survey Instruments (Section 8.3.1)
Table 13-1	– Incident Reporting Call List (Section 13.17)
Figure 1	Site Location Map – Middletown, RI
Figure 2	Hospital Route Map
Figure 3	Proposed Site/Work Area Layout
Figure 4	Proposed Haul Route

APPENDICES

APPENDIX A:	Site Health and Safety Plan Compliance Agreement
APPENDIX B:	Training Certificates for Key Project Personnel
APPENDIX C:	Forms and Logs
APPENDIX D:	Material Safety Data Sheets and Hazardous Materials Inventory Form
APPENDIX E:	Site Maps
APPENDIX F:	Accident Reports
APPENDIX G:	HASP Amendments

LIST OF ACRONYMS AND ABBREVIATIONS

ACRONYMS

ACGIH:	American Conference of Governmental Industrial Hygienists
ANSI:	American National Standards Institute
ATSDR:	Agency for Toxic Substances and Disease Registry
BBP:	Bloodborne Pathogen
CFR	Code of Federal Regulations
CHMM	Certified Hazardous Materials Manager
CIH	Certified Industrial Hygienist
CM	Construction Manager
CO	Contracting Officer
COC:	Contaminant of Concern
CPR	Cardiopulmonary Resuscitation
CS	Construction Superintendent
CSP	Certified Safety Professional
CRZ:	Contamination Reduction Zone
EIC:	Engineer-in-Charge
EMS:	Emergency Medical Service
EPA:	Environmental Protection Agency
EZ:	Exclusion Zone
FID	Flame Ionization Detector
GFCI	ground fault circuit innterrupter
HBV:	Hepatitis B Virus
HIV:	Human Immunodeficiency Virus
HPD	hearing protection devices
IDLH:	Immediately Dangerous to Life and Health
IR	installation restoration
LEL	Lower Explosive Limit
LEPC:	Local Emergency Planning Committee
MSDS:	Material Safety Data Sheet
NIOSH:	National Institute for Occupational Safety and Health
NOSC:	Navy On-Scene Coordinator
NOSCDR:	Navy On-Scene Commander
NRR	Noise Reduction Rating
OSHA:	Occupational Safety and Health Administration
OVM:	Organic Vapor Monitor
PCB:	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PEL:	Permissible Exposure Limit
PID:	Photoionization Detector
PM	Project Manager
PPE:	Personal Protective Equipment
PPM:	Parts Per Million
REL	Recommneded Exposure Limit

Naval Facilities Engineering Command - Northeast
IR Site 08 – NUSC Disposal Area Soil Removal Action, Naval Undersea Warfare Center, Middletown, RI
Health and Safety Plan Revision 2

RIDEM	Rhode Island Department of Environmental Management
SCBA:	Self Contained Breathing Apparatus
SHM	Safety and Health Manager
SOP:	Standard Operating Procedure
STEL:	Short Term Exposure Limit
TLV:	Threshold Limit Value

1.0 INTRODUCTION

1.1 Purpose

TN & Associates, Inc. (TN&A) views the implementation of this Health and Safety Plan (HASP) as a critical management element necessary to the success of the Installation Restoration (IR) Site 08 – NUSC Disposal Area Soil Removal Action Project. The HASP describes the activities to be performed at the IR Site 08 – NUSC Disposal Area Project, Naval Undersea Warfare Center, Middletown, Rhode Island (the “Site”) and identifies procedures to be followed to minimize the potential for personnel exposure to physical hazards during the project. All (TN&A) employees and subcontractors who perform field work during the project will be required to read this HASP and acknowledge receipt and understanding of this HASP by signing The Site Health and Safety Plan Compliance Agreement in Appendix A and submitting it to the Site Safety and Health Officer (SHSO) before performing any field activities.

The HASP will be periodically reviewed and modified throughout the duration of the project to ensure flexibility and adaptability as changes occur and new situations develop. Modifications to the HASP must be approved by the Construction Superintendent, the SHSO and the Corporate Safety and Health Manager.

1.2 Scope of the HASP

The HASP addresses all phases of field operations at the Site, including:

- Site characterization, including the history of the Site
- Responsibilities of key site personnel
- Work practices and Standard Operating Procedures (SOPs)
- Hazard identification and assessment, including chemical, physical, biological, and radiation hazards
- Identification of personal protective equipment (PPE) requirements
- Exposure monitoring/air sampling procedures (if required)
- Heat Stress monitoring
- Cold Stress monitoring
- Response procedures for accidents and emergencies
- Emergency contacts and telephone numbers
- Medical surveillance
- Training requirements for workers and on-site training
- Record keeping requirements.

Although safety and health is the responsibility of all personnel working at the Site (including subcontractors), TN&A has the primary responsibility of implementing the HASP. The SHSO has the authority to evaluate, correct, and take corrective actions when subcontract personnel do not follow the approved HASP.

1.3 Regulatory Authority

All on-site activities will be conducted in accordance with applicable federal Occupational Safety and Health Administration (OSHA) and other federal, state, local and site regulations and will be consistent with TN&A corporate commitment to personnel safety and health and the Corporate Safety and Health Program.

This HASP has been prepared to conform to the requirements of OSHA 29 Code of Federal Regulations (CFR) 1926 Construction regulations and the U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual (EM 385-1-1). This HASP has been prepared to conform to the requirements of following regulations:

- 29 Code of Federal Regulations (CFR) 1910.120 (Hazardous Waste Operations and Emergency Response)
- 29 CFR 1926.65 (Hazardous Waste Operations and Emergency Response for Constructions)
- 29 CFR 1910.1000 (Medical Monitoring Program)
- 29 1926 (b)(ii) (Medical Monitoring program)
- 29 CFR 1926 (e)(3) (40-hour OSHA HAZMAT Training)
- 29 CFR 1926 (d)(4)(ii)(D) Medical Surveillance requirements in accordance to paragraph (f).
- 29 CFR 1910.120 (f)(5) and 29 CFR 1926 (f)(5) The medical surveillance program should be performed by or under the direct supervision of a qualified physician board certified in occupational medicine.
- 29 CFR 1926 (d)(4)(ii)(F) Site Control Measures
- 29 CFR 1926 (d)(4)(ii)(G) Decontamination Procedures
- 29 CFR 1926 (d)(4)(ii)(H) Emergency Response Plan
- 29 CFR 1926 (d)(4)(ii)(I) Confined Space Entry
- 29 CFR 1926 (d)(4)(ii)(J) A Spill Containment Program
- 29 CFR 1926.65 (b)(ii)(B) (Training Assessment)
- The USACE EM 385-1-1 Section 28

2.0 KEY PERSONNEL AND PERSONNEL RESPONSIBILITIES

This section describes personnel responsibilities for implementation of the HASP. Clear lines of authority will be established for enforcing compliance with the HASP. Designated TN&A personnel are responsible for field implementation of the HASP. This includes field supervision, enforcing safe work practices, ensuring proper use of PPE, and communicating modified safety requirements to Site personnel.

To meet the TN&A corporate goal of **ZERO ACCIDENTS** and **SAFETY EXCELLENCE** and to meet its project safety and health objectives, the Project Team has developed a line of reporting and has tasked individuals with the following safety and health responsibilities. During site activities, at least two individuals on site will have certification in CPR/First Aid.

2.1 Project Manager

The Project Manager (PM) shall acquaint field personnel with potential hazards and procedures to minimize the negative impact of those hazards. Make available proper PPE and other safety equipment, adequate time and budget, and trained personnel to perform site work in a safe manner. Arrange for preparation of a HASP. The Project Manager for this project is Joe Clifford, P.E.

2.2 Construction Superintendent

Construction Superintendent (CS) shall ensure that site personnel have read, signed, and will follow the master copy of this document. Investigate and report to the PM each work-related illness or injury, near misses, accidents, and damage to physical property.

A current cardiopulmonary resuscitation (CPR)/First-Aid certification is required for the Construction Superintendent and the SHSO. Evidence of current training should be readily available. The Construction Superintendent for the project is Chris Miller.

2.3 TN&A Corporate Health and Safety Manager

The TN&A Corporate Health and Safety Manager (SHM - William S. Fink, CIH, CSP, CHMM) shall be responsible for the development, implementation, oversight, and enforcement of the HASP. The SHM will be available for emergency consultation and is the individual responsible for establishing and maintaining emergency communications with emergency response organizations. The SHM will provide consultation as needed to ensure the HASP is fully implemented, coordinate any modifications to the HASP with the Construction Manager (CM) and the Contracting Officer (CO) and review and approve HASP amendments for specific site tasks. The SHM will review accident reports and results of daily inspections and coordinate with the CM regarding policy or procedure changes that may impact the project.

2.4 Site Health & Safety Officer

The Site Health & Safety Officer (SHSO) will assist and represent the SHM in on-site training and the day-to-day on-site implementation and enforcement of the accepted HASP. Be assigned to the site on a full-time basis for the duration of field activities. Conduct initial site-specific training. Have authority to ensure site compliance with specified safety and health requirements including federal, state, and OSHA regulations and to enforce all aspects of the HASP including, but not limited to:

- Activity hazard analyses
- Use of PPE
- Decontamination procedures
- Site control

The SHSO has authority to stop work if unacceptable safety or health conditions exist and take necessary action to reestablish and maintain safe working conditions. The SHSO will consult with and coordinate any modifications to the HASP with the SHM, the CS, the PM, and the CO. The SHSO will serve as a member of the Contractor's quality control staff on matters relating to safety and health. The SHSO in conjunction with the CS will conduct accident investigations and prepare accident reports. The SHSO will review results of daily quality control inspections, complete exposure data, and document safety and health findings in the daily reports. In coordination with site management and the SHM, the SHSO will recommend corrective actions for identified deficiencies and oversee the corrective actions. The SHSO will provide continued support for upgrading/downgrading the level of PPE. The SHSO will be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.

A current CPR/First-Aid certification is required for the SHSO and the CS. Evidence of current training should be readily available. The SHSO for the project will be David Strickland.

2.5 Employees

As required: Obey safety and health work practices issued by law and by the Project Team. Read, understand, and sign the HASP. (Signature forms are located in Appendix A of this HASP.) Wear PPE as directed by this HASP. Use safety equipment as directed by this HASP. Inform the SHSO of any prescription medication taken during the project. Report recognized unsafe conditions and actions to the SHSO. Report any accidents, exposures, near misses, or property damage immediately.

2.6 Visitors

Visitors must follow the direction of the SHSO. If visitors are required to enter the work area, they are to read, understand, and sign the Site Health and Safety Plan Compliance Agreement found in Appendix A. Visitors do not enter the work area unless documentation of the appropriate OSHA-required training has been obtained and submitted to the SHSO, and they have been authorized to enter the work area. Visitors must use designated PPE, as appropriate. Visitors must use safety equipment as directed by this HASP. Visitors must report recognized unsafe conditions and actions to the SHSO. Visitors must report any accidents, exposures, near misses, or property damage immediately.

2.7 Work Stoppage Authority

The SHSO, the CS and PM will have the authority to make on-the-spot corrections dealing with deviations from the HASP. If it is felt that the infraction cannot be remedied immediately and that continuance of the job could result in significant violations, the SHSO, the CS and/or PM will have the authority to order a cessation of the activity until the problem can be remedied.

3.0 SITE DESCRIPTION

3.1 Site History

The Navy Engineering Field Activity, Northeast Naval Facilities Engineering Command has requested TN & Associates, Inc. to provide the services necessary for the removal of soils, drums and buried metal containers from the IR Site 08 – NUSC Disposal Area at the Naval Undersea Warfare Center in Middletown, Rhode Island as detailed in Solicitation N62472-04-Q-EM52 dated 20 August 2004. The basic “scope” for the project will be the excavation, and removal from the site, of two potential contamination source areas within the NUSC Disposal Area that were identified during a Site Investigation performed in August of 2003 by Tetra Tech NUS, Inc.

The Naval Undersea Warfare Center (NUWC) is located in Middletown, Rhode Island immediately adjacent to the Naval Station Newport. The NUSC Disposal Area occupies approximately 8 acres north of Building No. 185 and Cunningham Street. The Wanumetonomy Golf and County Club borders the site to the north. Building No.185 consists of a series of four open-sided covered sheds with 2-foot high concrete berms. Building No.185 is considered the southern southeastern limit of the site. The sheds are used for storage of drummed oils and torpedo propellants (otto fuel). A small stream, identified as Deerfield Creek, and the surrounding wetlands, make up the southwestern site boundary. The NUSC Disposal Area extends west-northwest to the small pond know as “Deerfield Pond” or “NUWC pond”.

The upland portions were used as a fill area and storage areas since the Navy developed the site in the early 1950’s. The site topography is highly variable, with topographic relief of approximately 33 feet from the northern to the southern portions of the site. Elevations range from approximately 58 feet at the southeast corner of the disposal area to 25 feet, which was the measured elevation of the pond at the north end of the disposal area.

There is limited available historical information o the NUSC Disposal Area. The site is reported to have been used for disposal of scrap lumber, tires, wire, cable and empty paint cans for an unspecified period of time between the 1950’s and 1988. Possible chemical hazards may include Volatile Organic Compounds (VOCs) and heavy metals from paint residues, as well as methane produced from natural decomposition of organic materials. Other possible chemical hazards exist due to the “functions” of the Facility and site workers may encounter Otto Fuel II, which the Navy uses as fuel for torpedoes and other weapon systems. Another chemical that may be encountered is Hydrogen Cyanide (HCN), which would be present, in high concentrations, in used oil from torpedo engines.

A Study Area Screening Evaluation (SASE) for the NUSC Disposal Area was conducted in June-November 2003. The SASE found some areas where elevated VOCs were present and these, along with other target areas were investigated with a series of test pits, soil borings and groundwater monitoring wells. Chlorinated solvents (TCE and PCE were found in groundwater at the north (downgradient) end of the site. TCE was also found in soil gas in the central portion of the site, near buried drums (Buried Drum Area), although only low concentrations of TCE were detected in soils and groundwater in this area. During excavation of Test Pit 02, a corroded 55-gallon drum with a tar-like substance was removed and disposed of off-site. The drum was located approximately six (6) feet below ground and two (2) additional drums were observed in the sidewalls of the test pit, but not removed.

Other findings of the SASE included a large number of buried deteriorated metal containers that are possible empty aerosol paint cans in the stream embankment in the south west portion of the site (Buried Metal Container Area), confirmed through test pit excavation (TP14) in this area. Elevated concentrations of lead were found co-located with these containers and in the stream sediments downstream as far as the NUWC Pond. The horizontal extent of the buried metal container area is unknown, but the vertical extent is anticipated to be less than 8 feet below ground surface.

3.2 Site Status

The Naval Undersea Warfare Center is currently fully active and work at the Site will have to be performed without interrupting any of the Center's ongoing activities, such as testing, maintenance and recreation (ie: the access road is part of the Center's exercise course and can not be blocked). Periodic testing of torpedo components takes place in the general vicinity of the NUSC Disposal Area and during testing periods, which occur once or twice per month for about 30 minutes, work will be stopped and the area work vacated.

Currently at the NUSC Disposal Area, there is a secured storage area and open storage area (both paved – approximately 2.3 acres) as well as open fields (1.6 acres) and brush covered areas (4.2 acres). The storage areas are used by NUWC for the temporary storage of large equipment.

4.0 HAZARD IDENTIFICATION AND ANALYSIS

4.1 Summary of Site Field Activities

The following are the site field activities necessary to address the soil removal action at the IR Site 08 – NUSC Disposal Area:

- Mobilization and Demobilization
- Site Preparation including clearing and grubbing
- Establishment of temporary support facilities including a small office trailer and portable sanitation units
- Utility Location, Identification and Dig Permits
- Installation of Soil Erosion Control Measures
- Demarcation of the two excavation areas (buried drum and metal container areas)
- Construction of soil, drum and debris staging areas
- Excavation of the buried drum area to the dimensions required (15' from center of TP02 - 96 CY estimated)
 - Uncovering, removal and overpacking of any drums encountered (2 previously identified drums, 8 additional drums estimated).
 - Removal and staging (in the soil, drum and debris staging area) of soils deemed “contaminated” via “field screening” (8 tons ~ 5.6 CY - estimated).
 - Removal and staging (adjacent to the excavation) of soils not deemed “contaminated” via “field screening” (90.4 CY - estimated).
- Excavation of the buried metal debris drum area to the dimensions required (200 CY ~ 284 tons – estimated)
 - Excavation and staging (adjacent to the excavation) overlying “clean” soils.
 - Uncovering, removal and staging of buried metal debris and associated soils.
 - Staging debris/soils in maximum 50 CY stockpiles.
- Sampling and Analyses
 - Removed and overpacked drums to be sampled for RCRA Characteristics, Full TCLP, PCBs, Total Petroleum Hydrocarbons and any other analyses required in support of offsite disposal.
 - Staged “contaminated” soils and debris stockpiles (<50 CY) to be sampled via collection of a 4-point composite sample. Samples to be analyzed for Full TCLP, PCBs, Total Petroleum Hydrocarbons and any other analyses required for offsite disposal.
 - Proposed fill and topsoil materials to be sampled and analyzed for the same above components in order to “certify” that the proposed materials are “clean” as compared to the RIDEM Direct Exposure Criteria for residential use soils. 1 sample per source required.
- Load-out of Drums, soils and debris
- Grading, Backfill, and Compaction
 - Backfill of excavations with excavated soils staged adjacent to the excavation.
 - Backfill of the remainder of the excavations with imported “certified clean” fill.
 - Backfill materials compacted to 90% of the maximum dry density.
- Topsoil Placement
 - Excavation areas covered with a 4-inch thick layer of topsoil.

- Seeding, Fertilizing and Mulching
 - All disturbed areas to be restored with the specified “Park Mix” grass/turf seed.
 - All disturbed areas to be limed, mulched and fertilized as required.
- Punch List
- Demobilization of contractor personnel, equipment, materials and temporary facilities
- Preparation of post-construction deliverables including a Health and Safety Close-Out Report and an overall Project Close-out Report.

4.2 Summary of Activity Hazard Analysis (General)

Table 4-1 contains the Activity Hazard Analysis Summary for the Site. The first column lists the major activities anticipated for the Site. The second column is for potential hazards associated with these activities. The third column lists the precautions or controls to be implemented for each activity. The levels of precautions or controls will be upgraded or downgraded as appropriate, based on air monitoring data and Site conditions. These changes will be initiated by the SHSO and approved by the PM and the SHM. No confined space work exists for this project and none will be created. The number of tasks at the site coincides with the number of AHA.

4.3 Physical Hazards

Potential physical hazards that may be encountered during work at the Site include the following:

- Heat stress
- Physical hazards associated with the use of heavy equipment, vehicles and trucks
- Excessive noise levels from heavy equipment operations
- Physical hazards associated with lifting/handling heavy equipment
- Hazards Associated with excavation and handling of unknown drums

4.3.1 Heat Stress

Wearing PPE puts a hazardous waste worker at a considerable risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness and death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites, regular monitoring and other preventive precautions are vital.

Individuals vary in their susceptibility to heat stress. Factors that may predispose someone to heat stress include:

- Lack of physical fitness
- Lack of acclimatization
- Age
- Dehydration
- Obesity
- Alcohol and drug use
- Infection
- Sunburn

- Diarrhea
- Chronic disease

Reduced work tolerance and increased risk of excessive heat stress is directly influenced by the amount and type of PPE worn. PPE adds weight and bulk, severely reduces the body's access to normal heat exchange mechanisms (evaporation, convection, and radiation), and increases energy expenditure. Therefore, when selecting PPE, each item's benefit should be carefully evaluated in relation to its potential for increasing the risk of heat stress, once the PPE is selected, the safe duration of work/rest periods should be determined based on the:

- Anticipated work rate
- Ambient temperature and other environmental factors
- Type of protective ensemble
- Individual worker characteristics and fitness

4.3.1.1 Heat Stress Monitoring

Heat stress will be monitored in accordance with USACE EM 385-1-1, Section 06.J and the ACGIH "TLV and BEI", 2003 edition, Thermal Stress – Heat Stress guidelines. Because the incidence of heat stress depends on a variety of factors, all workers, even those not wearing protective equipment, should be monitored.

For workers wearing permeable clothing (e.g., standard or synthetic work clothes), the recommendations for monitoring requirements and suggested work/rest schedules in published in the American Conference of Governmental industrial Hygienists (ACGIH) Threshold Limit Values (TLVs®) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs®), 2004 edition will be followed. For sake of brevity, they are not repeated in this HASP, however, a copy of the requirements will be kept on-site with the SHSO.

If the actual clothing worn differs from the ACGIH standard ensemble in insulation value and/or wind and vapor permeability, the monitoring requirements and work/rest schedules will be changed accordingly

When the body temperature rises, the body seeks to dissipate the excess heat. The major disorders due to heat stress are heat cramps, heat exhaustion, and heat stroke. The symptoms and recommended prevention for each are listed below:

- Heat cramps are painful spasms that may occur in the muscles of workers who have perspired profusely in the heat. If this occurs work should be stopped and worker supplied with fluids.
- Heat exhaustion is characterized by extreme weakness or fatigue, dizziness, nausea, and headache. In serious cases, a worker may vomit or lose consciousness. The skin is clammy and moist, complexion pale or flushed, and the body temperature can be normal or slightly higher than normal. Treatment consists of rest in a cool place and replacement of body water lost by perspiration. Mild cases may recover spontaneously with this treatment. Severe cases may require care for several days. There are no permanent effects.
- Heat stroke is caused by the breakdown of the body's heat regulating mechanism. The skin is very dry and hot with a red or bluish appearance. Unconsciousness, mental confusion, or convulsions may occur. Without quick and adequate treatment, the result can be permanent brain damage or death. Medical assistance should be given quickly. The person should be moved to a cool place. Body heat should be reduced by soaking the person's clothes with water.

Naval Facilities Engineering Command - Northeast
IR Site 08 – NUSC Disposal Area Soil Removal Action, Naval Undersea Warfare Center, Middletown, RI
Health and Safety Plan Revision 2

Concerns with heat stress generally can be expected whenever temperatures exceed 80° F. Therefore, the following requirements should be initiated and adhered to when ambient temperature exceeds 80° F:

- Acclimate the body to the working environment.
- Drink cool water to replace body fluids lost during sweating. Site personnel taking prescribed heart and/or high blood pressure medication may require electrolyte replenishing liquids to combat heat stress. It is recommended that each individual taking prescribed heart and/or high blood pressure medication consult his personal physician prior to consuming these drinks.
- Wear personal cooling devices only in extreme cases.
- Wear supplied air suits or respirators equipped with a vortex tube that cools the air being supplied.
- Take rest breaks as frequently as necessary to prevent personal distress and development of symptoms.
- Count pulse rate during a 30-second period as early as possible in the rest break. If heart rate exceeds 110 beats per minute at the beginning of the rest break, shorten the next work cycle by one-third and keep the rest break the same. If the heart rate still exceeds 110 beats per minute at the next rest break, shorten the following work cycle by one-third.

Action Levels for Heat Stress

Type of Measurement	Action Level	Action
Ear-insertable core temperature	100.4 degrees F or greater	Remove from work
Ear-insertable core temperature	<99 degrees F	Return to work

Frequency of Physiological Monitoring for Fit and Acclimated Workers

Adjusted Temperature ^a	Normal Work Ensemble ^b After Each:	Impermeable Ensemble After Each:
90 F (32.2 C) or above	45 minutes of work	15 minutes of work
86.5 - 90 F (30.8 – 32.2 C)	60 minutes of work	30 minutes of work
82.5 -86.5 F (28.1 – 30.8 C)	90 minutes of work	60 minutes of work
76.5 - 82.5 F (25.3 – 28.1 C)	120 minutes of work	90 minutes of work
72.5 – 76.5 F (22.5 – 25.3 C)	150 minutes of work	120 minutes of work

Notes:

^a calculate the adjusted air temperature (Ta adj) with the following equation:

$$Ta\ adj(F) = Ta(F) + 13 \times \% \text{ sunshine} / 100$$

Measure air temperature (Ta) with a standard mercury in glass thermometer with the bulb shielded from radiant heat; estimate the percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to attenuate shadow (100% sunshine = no cloud cover and a sharp, distinct shadow;) 5 sunshine = no shadow)

^b A normal work ensemble consists of coveralls or other cotton clothing with long sleeves and pants

Acronymns/Abbreviations

C – degrees Celsius

F – degrees Fahrenheit

Naval Facilities Engineering Command - Northeast
IR Site 08 – NUSC Disposal Area Soil Removal Action, Naval Undersea Warfare Center, Middletown, RI
Health and Safety Plan Revision 2

Screening Criteria for Heat Stress Exposure
(WBGT Values in °C)

Work Demands	Acclimatized				Unacclimatized			
	Light	Moderate	Heavy	Very Heavy	Light	Moderate	Heavy	Very Heavy
100% Work	29.5	27.5	26		27.5	25	22.5	
75% Work; 25% Rest	30.5	28.5	27.5		29	26.5	24.5	
%0% Work; 50% Rest	31.5	29.5	28.5	27.5	30	28	26.5	25
25% Work; 75% Rest	32.5	31	30	29.5	31	29	28	26.5

WBGT values are calculated using the following equations:

- With direct exposure to sunlight:

$$WBGT_{out} = 0.7T_{nwb} + 0.2T_g + 0.1T_{db}$$

- Without direct exposure to the sun:

$$WBGT_{in} = 0.7T_{nwb} + 0.3T_g$$

Where:

T_{nwb} = natural wet bulb temperature (sometimes called NWB)

T_g = globe temperature (sometimes called GT)

T_{db} = dry bulb (air) temperature (sometimes called DB)

Examples of Activities within Metabolic Rate Categories

Categories	Examples Activities
Resting	Sitting quietly
	Sitting with moderate arm movements
Light	Sitting with moderate leg and arm movements
	Standing with light work at machine or bench while using mostly arms
	Using a table saw
	Standing with light or moderate work at a machine or bench and some walking about
Moderate	Scrubbing in a standing position
	Walking about with moderate lifting or pushing
	Walking on a level at Km/hr while carrying 3 Kg weight load
Heavy	Carpenter sawing by hand
	Shoveling dry sand
	Heavy assembly work on a noncontinuous basis
	Intermittent heavy lifting with pushing or pulling (e.g., pick-and-shovel work)
Very Heavy	Shoveling wet sand

HEAT DISORDERS AND HEALTH EFFECTS

HEAT STROKE occurs when the body's system of temperature regulation fails and body temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of work load and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately see Tables 4.1a and 4.1b and 4.2a (Attachment A). The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be

increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protests, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

HEAT EXHAUSTION The signs and symptoms of heat exhaustion are headache, nausea, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment. Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment and given fluid replacement. They should also be encouraged to get adequate rest.

HEAT CRAMPS are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused by both too much and too little salt. Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution ($\pm 0.3\%$ NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for 6 to 8 hours in heavy protective gear, a loss of sodium may occur. Recent studies have shown that drinking commercially available carbohydrate-electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

HEAT COLLAPSE ("Fainting") In heat collapse, the brain does not receive enough oxygen because blood pools in the extremities. As a result, the exposed individual may lose consciousness. This reaction is similar to that of heat exhaustion and does not affect the body's heat balance. However, the onset of heat collapse is rapid and unpredictable. To prevent heat collapse, the worker should gradually become acclimatized to the hot environment.

HEAT RASHES are the most common problem in hot work environments. Prickly heat is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat

rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

HEAT FATIGUE A factor that predisposes an individual to heat fatigue is lack of acclimatization. The use of a program of acclimatization and training for work in hot environments is advisable. The signs and symptoms of heat fatigue include impaired performance of skilled sensorimotor, mental, or vigilance jobs. There is no treatment for heat fatigue except to remove the heat stress before a more serious heat-related condition develops.

CONTROL

Ventilation, air cooling, fans, shielding, and insulation are the five major types of engineering controls used to reduce heat stress in hot work environments. Heat reduction can also be achieved by using power assists and tools that reduce the physical demands placed on a worker.

However, for this approach to be successful, the metabolic effort required for the worker to use or operate these devices must be less than the effort required without them. Another method is to reduce the effort necessary to operate power assists. The worker should be allowed to take frequent rest breaks in a cooler environment.

ACCLIMATIZATION

1. The human body can adapt to heat exposure to some extent. This physiological adaptation is called acclimatization. After a period of acclimatization, the same activity will produce fewer cardiovascular demands. The worker will sweat more efficiently (causing better evaporative cooling), and thus will more easily be able to maintain normal body temperatures see Table 4.3.
2. A properly designed and applied acclimatization program decreases the risk of heat-related illnesses. Such a program basically involves exposing employees to work in a hot environment for progressively longer periods. NIOSH (1986) says that, for workers who have had previous experience in jobs where heat levels are high enough to produce heat stress, the regimen should be 50% exposure on day one, 60% on day two, 80% on day three, and 100% on day four. For new workers who will be similarly exposed, the regimen should be 20% on day one, with a 20% increase in exposure each additional day.

FLUID REPLACEMENT Cool (50°-60°F) water or any cool liquid (except alcoholic beverages) should be made available to workers to encourage them to drink small amounts frequently, e.g., one cup every 20 minutes. Ample supplies of liquids should be placed close to the work area. Although some commercial replacement drinks contain salt, this is not necessary for acclimatized individuals because most people add enough salt to their summer diets.

ENGINEERING CONTROLS

1. **General ventilation** is used to dilute hot air with cooler air (generally cooler air that is brought in from the outside). This technique clearly works better in cooler climates than in hot ones. A permanently installed ventilation system usually handles large areas or entire buildings. Portable or local exhaust systems may be more effective or practical in smaller areas.
2. **Air treatment/air cooling** differs from ventilation because it reduces the temperature of the air by removing heat (and sometimes humidity) from the air.
3. **Air conditioning** is a method of air cooling, but it is expensive to install and operate. An alternative to air conditioning is the use of chillers to circulate cool water through heat exchangers over which air from the ventilation system is then passed; chillers are more efficient in cooler climates or in dry climates where evaporative cooling can be used.
4. **Local air cooling** can be effective in reducing air temperature in specific areas. Two methods have been used successfully in industrial settings. One type, cool rooms, can be used to enclose a specific workplace or to offer a recovery area near hot jobs. The second type is a portable blower with built-in air chiller. The main advantage of a blower, aside from portability, is minimal set-up time.
5. Another way to reduce heat stress is to increase the air flow or **convection** using fans, etc. in the work area (as long as the air temperature is less than the worker's skin temperature). Changes in air speed can help workers stay cooler by increasing both the convective heat exchange (the exchange between the skin surface and the surrounding air) and the rate of evaporation. Because this method does not actually cool the air, any increases in air speed must impact the worker directly to be effective.

If the dry bulb temperature is higher than 35°C (95°F), the hot air passing over the skin can actually make the worker hotter. When the temperature is more than 35°C and the air is dry, evaporative cooling may be improved by air movement, although this improvement will be offset by the convective heat. When the temperature exceeds 35°C and the relative humidity is 100%, air movement will make the worker hotter. Increases in air speed have no effect on the body temperature of workers wearing vapor-barrier clothing.

Heat conduction methods include insulating the hot surface that generates the heat and changing the surface itself.

Simple engineering controls, such as shields, can be used to reduce radiant **heat**, i.e. heat coming from hot surfaces within the worker's line of sight. Surfaces that exceed 35°C (95°F) are sources of infrared radiation that can

add to the worker's heat load. Flat black surfaces absorb heat more than smooth, polished ones. Having cooler surfaces surrounding the worker assists in cooling because the worker's body radiates heat toward them.

With some sources of radiation, such as heating pipes, it is possible to use both insulation and surface modifications to achieve a substantial reduction in radiant heat. Instead of reducing radiation from the source, shielding can be used to interrupt the path between the source and the worker. Polished surfaces make the best barriers, although special glass or metal mesh surfaces can be used if visibility is a problem.

Shields should be located so that they do not interfere with air flow, unless they are also being used to reduce convective heating. The reflective surface of the shield should be kept clean to maintain its effectiveness.

ADMINISTRATIVE CONTROLS AND WORK PRACTICES

1. Training is the key to good work practices. Unless all employees understand the reasons for using new, or changing old, work practices, the chances of such a program succeeding are greatly reduced.
2. NIOSH (1986) states that a good heat stress training program should include at least the following components:
 - Knowledge of the hazards of heat stress;
 - Recognition of predisposing factors, danger signs, and symptoms;
 - Awareness of first-aid procedures for, and the potential health effects of, heat stroke;
 - Employee responsibilities in avoiding heat stress;
 - Dangers of using drugs, including therapeutic ones, and alcohol in hot work environments;
 - Use of protective clothing and equipment; and
 - Purpose and coverage of environmental and medical surveillance programs and the advantages of worker participation in such programs.
3. Hot jobs should be scheduled for the cooler part of the day, and routine maintenance and repair work in hot areas should be scheduled for the cooler seasons of the year.

WORKER MONITORING PROGRAMS

1. Every worker who works in extraordinary conditions that increase the risk of heat stress should be personally monitored. These conditions include wearing semipermeable or impermeable clothing when the temperature

- exceeds 21°C (69.8°F), working at extreme metabolic loads (greater than 500 kcal/hour), etc.
2. Personal monitoring can be done by checking the heart rate, recovery heart rate, oral temperature, or extent of body water loss.
 3. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period.
 4. The recovery heart rate can be checked by comparing the pulse rate taken at 30 seconds (P₁) with the pulse rate taken at 2.5 minutes (P₃) after the rest break starts.
 5. Oral temperature can be checked with a clinical thermometer after work but before the employee drinks water. If the oral temperature taken under the tongue exceeds 37.6°C, shorten the next work cycle by one third.
 6. Body water loss can be measured by weighing the worker on a scale at the beginning and end of each work day. The worker's weight loss should not exceed 1.5% of total body weight in a work day. If a weight loss exceeding this amount is observed, fluid intake should increase.

OTHER ADMINISTRATIVE CONTROLS The following administrative controls can be used to reduce heat stress:

- Reduce the physical demands of work, e.g., excessive lifting or digging with heavy objects;
- Provide recovery areas, e.g., air-conditioned enclosures and rooms;
- Use shifts, e.g., early morning, cool part of the day, or night work;
- Use intermittent rest periods with water breaks;
- Use relief workers;
- Use worker pacing; and
- Assign extra workers and limit worker occupancy, or the number of workers present, especially in confined or enclosed spaces.

Heat Stress and PPE

- Note that wearing protective clothing creates some problems, the main one being that the body is shielded from normal circulation of air. Perspiration does not evaporate, thus eliminating the body's main mechanism for cooling. A cool towel on the back of the neck will effectively cause the hypothalamus (the body's thermostat) to reduce the body's temperature immediately by 2-4 degrees in a **heat stress** situation. Otherwise, the body is prone to **heat stress**, including **heat** stroke, which can be fatal. **Heat** related problems are very common when temperature rises above 75 degrees F. Work schedules for persons wearing fully encapsulating clothing must be closely and conservatively regulated lest
- **heat stress** becomes more of a threat than the chemical hazard itself see Table 4.2B. The best way to combat **heat stress** is to allow the body to cool normally. The most efficient body cooling process is by evaporation. While wearing protective clothing that has no ventilation

people perspire profusely. If the perspiration remains in contact with the skin, it has a better chance of evaporating and cooling the body surface. If the perspiration is allowed to run off the body quickly, less evaporation occurs. This happens when shorts are worn under a fully encapsulating suit.

- Suit material can become very hot and cause severe burns if it contacts the wearer's bare skin. Long cotton underwear is a good solution to this problem. It clings to the body when soaked with perspiration, thus allowing the greatest amount of cooling by evaporation and also protects the body from burns caused by the suit itself.
- During extended periods of work in fully encapsulating suits, some sort of "cooling" must be provided to the wearer. The best method is to schedule frequent rest periods. If this is not adequate, a cooling device should be employed. Effective cooling units are available for use with supplied-air units. A vortex tube separates the air into cool and warm components, releasing the warm air outside the suit. When self-contained air is used for breathing, the cooling device must also be self-contained. For example, vests have been designed to carry ice packs. There are other commercial devices available to combat **heat** generated by fully encapsulating suits.

REFLECTIVE CLOTHING, which can vary from aprons and jackets to suits that completely enclose the worker from neck to feet, can stop the skin from absorbing radiant heat. However, since most reflective clothing does not allow air exchange through the garment, the reduction of radiant heat must more than offset the corresponding loss in evaporative cooling. For this reason, reflective clothing should be worn as loosely as possible. In situations where radiant heat is high, auxiliary cooling systems can be used under the reflective clothing.

AUXILIARY BODY COOLING.

- Commercially available **ice vests**, though heavy, may accommodate as many as 72 ice packets, which are usually filled with water. Carbon dioxide (dry ice) can also be used as a coolant. The cooling offered by ice packets lasts only 2 to 4 hours at moderate to heavy heat loads, and frequent replacement is necessary. However, ice vests do not encumber the worker and thus permit maximum mobility. Cooling with ice is also relatively inexpensive.
- **Wetted clothing** is another simple and inexpensive personal cooling technique. It is effective when reflective or other impermeable protective clothing is worn. The clothing may be wetted terry cloth coveralls or wetted two-piece, whole-body cotton suits. This approach to auxiliary cooling can be quite effective under conditions of high temperature and low humidity, where evaporation from the wetted garment is not restricted.
- **Water-cooled garments** range from a hood, which cools only the head, to vests and "long johns," which offer partial or complete body cooling. Use of this equipment requires a battery-driven circulating pump, liquid-ice

coolant, and a container.

Although this system has the advantage of allowing wearer mobility, the weight of the components limits the amount of ice that can be carried and thus reduces the effective use time. The heat transfer rate in liquid cooling systems may limit their use to low-activity jobs; even in such jobs, their service time is only about 20 minutes per pound of cooling ice. To keep outside heat from melting the ice, an outer insulating jacket should be an integral part of these systems.

- **Circulating air** is the most highly effective, as well as the most complicated, personal cooling system. By directing compressed air around the body from a supplied air system, both evaporative and convective cooling are improved. The greatest advantage occurs when circulating air is used with impermeable garments or double cotton overalls.

One type, used when respiratory protection is also necessary, forces exhaust air from a supplied-air hood ("bubble hood") around the neck and down inside an impermeable suit. The air then escapes through openings in the suit. Air can also be supplied directly to the suit without using a hood in three ways:

- by a single inlet;
- by a distribution tree; or
- by a perforated vest.

In addition, a vortex tube can be used to reduce the temperature of circulating air. The cooled air from this tube can be introduced either under the clothing or into a bubble hood. The use of a vortex tube separates the air stream into a hot and cold stream; these tubes also can be used to supply heat in cold climates. Circulating air, however, is noisy and requires a constant source of compressed air supplied through an attached air hose. One problem with this system is the limited mobility of workers whose suits are attached to an air hose. Another is that of getting air to the work area itself. These systems should therefore be used in work areas where workers are not required to move around much or to climb. Another concern with these systems is that they can lead to dehydration. The cool, dry air feels comfortable and the worker may not realize that it is important to drink liquids frequently.

- B. **RESPIRATOR USAGE.** The weight of a self-contained breathing apparatus (SCBA) increases stress on a worker, and this stress contributes to overall heat stress. Chemical protective clothing such as totally encapsulating chemical protection suits will also add to the heat stress problem.

Concerns with heat stress generally can be expected when wearing level D PPE (non coverall) when ever temperature exceed 80 F. This is a general guidance. Additional factors would be time exposed, work load (release of energy), stress (blood pressure) and core temperature. The

main factor would be monitoring the core temperature and continue activities along with sufficient breaks.

4.3.2 Heavy Equipment Operation

The operation of heavy construction equipment poses the most common threat to ground based personnel on any excavation or construction project. The ability for ground based personnel to be “hidden” from an equipment operator in the many “blind spots” that typical construction equipment inherently possess is significant. An the ability for ground based personnel to emerge from a blind spot “un-noticed” by an equipment operator involved with his current “task at hand” is also significant. Measures will be made to restrict the access to active excavation areas by persons on foot.

All employees entering an active “work area” will be required to wear high visibility fluorescent orange or yellow safety vests in addition the required hard hats, safety glasses and steel toed safety shoes. All excavation and construction equipment will be equipped with operational motion alarms and these alarms will be inspected daily. If a piece of equipment is found to have a defective motion alarm, it will be taken out of service until the alarm is repaired.

No lifting will be permitted with a piece of construction equipment that does no have a legible ratings capacity chart conspicuously displayed within the operator cab. In addition, lifting will not be permitting using lifting hooks and eyes that have not been installed by the manufacturer of the equipment to which it is attached (ie: excavator or loader bucket). Lifting will only be permitted when lifting straps or slings, with legible load rating tags, are securely attached to the machine with a properly sized shackle. Commonplace lifting actions, such as looping over bucket teeth, will not be permitted on this, or any other TN&A project.

Active excavation work areas will be demarcated with yellow “caution” tape or orange safety fence to identify the potential hazards to persons traversing the site. Access to the site will be limited to those persons involved with the project such that the number of persons on the site is kept to a minimum.

Heavy Equipment Hazards

Because an equipment operator's visibility may be obscured by the load being handled, dusty conditions, complicated terrain, or other equipment, all personnel must be responsible for being aware of equipment operation.

Requirements that must be met during the operation of heavy equipment include the following:

- Equipment must be in good working order and safe to operate at all time
- Equipment must have a Heavy Equipment Certification form (or equivalent) on file with the SHSO
- Equipment must be inspected daily with an inspection form completed by the operator and submitted to the SHSO prior to the equipment being started on the job for the day
- The operator must visually inspect equipment after each break
- Monthly inspections are required with records required to be on-file with the SHSO

- Equipment must have backup alarms
- Personnel must be constantly aware of moving or rotating equipment
- Operators must remain in moving equipment until it stops
- Removal actions on sites close to occupied areas often create “perceived” health concerns resulting from dust blowing off of the site. This work location appears to be relatively close to occupied areas. Therefore, TN&A needs to establish a policy to begin dust suppression procedures if dusts are visually observed blowing toward occupied areas
- Personnel will not wear loose clothing or jewelry
- Personnel must tie back long hair
- Personnel must be aware of traffic patterns and observe all traffic rules
- All heavy equipment must be shut down if unoccupied

Operations Adjacent to Overhead Electrical Lines:

During heavy equipment operations, the equipment and any overhead power transmission lines will be separated by the distance indicated below. In the event of a lightning storm, equipment operation will be halted, and personnel will maintain at least a 10-ft distance from the equipment.

Safe working distances from power lines for heavy equipment are indicated in Table 4.6 in Attachment A (USACE, EM 385-1-1, 3 November 2003).

Electrical Storms

Monitor local weather through available media or a weather radio.

During daily safety meetings address inclement weather procedures:

Lightning and/or Thunder:

Equipment shutdown

Proceed to support zone

Await further instruction from Project Manager or SHSO

NOTE: A 30-min. STAND DOWN period is required after encountering Lightning or Thunder in order to allow the storm to pass. Verification from the National Weather Service for an ALL Clear is also advised prior to re-commencing work

4.3.3 Noise Hazards

Noise is defined as unwanted sound in the form of vibration conducted through liquids, solids, or gases. The effects of noise on humans include psychological effects (interference with communication by speech, job performance, and safety) and physiological damage such as hearing loss. Of these, the most debilitating is hearing loss. The permissible exposure levels (PELs) for noise are as follows:

Table 4-4 - PERMISSIBLE EXPOSURE LIMITS FOR NOISE

Duration (per day)	Measurement (dBA)
8 hours	90
6 hours	92
4 hours	95
3 hours	97
2 hours	100
1.5 hours	102
1 hours	105
30 minutes	110
15 minutes	115

dBA = decibels on an A-rated scale

The factors that affect the degree and extent of hearing loss are intensity or loudness of the noise, type of noise, period of exposure each day, total work duration, and distance from the source.

Where 8-hour time-weighted averages are 85-dBA or greater, a hearing conservation program is required. This includes an initial audiogram to establish a baseline on the employee's hearing ability, followed by an annual audiogram to measure hearing. The conservation program should also allow employees access to their audiogram records.

OSHA regulations stipulate that when employees are subject to sound that exceeds the PEL, feasible administrative or engineering controls shall be used. If controls fail to reduce sound exposure to within the PEL, PPE must be provided and used to decrease sound levels to within the PEL. Use of PPE (e.g., earplugs or muffs) should be implemented immediately upon discovery of sound levels above the action level pending evaluation of suitable engineering controls. Exposure to impact noise should not exceed the 140-dBA peak sound level.

The potential for loud noise at this site is associated with welding, cutting, and other construction activities. However, prolonged exposure to noise exceeding PEL is unlikely. However, if the noise monitoring is necessary, as determined by Site Health and Safety Officer, then the monitoring will be conducted using a dosimeter with datalogging capabilities.

4.3.3.1 Unacceptable Noise Levels

Unacceptable levels of noise can be expected when working in close proximity to heavy machinery. Hearing protection is required when working within 30 feet of operating heavy machinery. Hearing protection is required when the sound level is above 85 decibels (dB) over an eight hour period (short term exposure allows for higher levels in a shorter time span (see Table 4-4 for the acceptable levels). As a rule of thumb, the dB level is above 85 when you have to speak loudly to a person at an arms length or less away. Noise monitoring is not planned for remediation activities at this site. To eliminate the need for noise monitoring for short term exposure (short durations), hearing protection will be worn near heavy equipment.

4.3.3.2 Hearing Protection Devices (HPDs)

Expandable foam earplugs or earmuffs will be worn whenever personnel are working and hearing protection is required.

Minimum noise reduction rating (NRR) for earplugs or earmuffs is 25dBA.

Hand signals will be used when noisy conditions exist and/or when hearing protection devices are used. The hand signals to be used will be discussed and agreed upon by Site personnel before working with hearing protection.

4.3.3.3 Placarding

“Hearing Protection Required” placards will be required on the exterior of the cabs of the heavy equipment (excavators) used at this project site.

4.3.4 Proper Lifting Procedures

Proper lifting procedures will be employed and enforced on this and all TN&A projects. TN&A, and our Subcontractors, will utilize a piece of mechanical equipment to perform any heavy lifting required during execution of the “work”. Uncovering, lifting and moving drums will be performed with either an excavator or a backhoe. Placing drums into an overpack, if required, will also be performed with the excavator or a backhoe. Moving of equipment, supplies and materials will be performed with a machine unless limited access prevents the use of a machine. In that situation, the buddy system will be used to move heavy items. Heavy items will only be moved far enough to reach a point where a piece of equipment, or other mechanical means of lifting/moving, can be employed. Employees who perform routine lifting will be required to wear a back support brace, which will be made available to them.

4.3.5 Hazards Associated with Excavating and Handling Unknown Drums

The drums expected to be encountered during the excavation of the “Buried Drum Area” are of a potentially unknown nature. One (1) drum was removed during the previous investigation that contained a tar-like substance and may be representative of the contents of the other drums witnessed in Test Pit 02, but that cannot be quantified. Historical uses of the Disposal Area included storage of used engine oil from torpedo engines that contains residual propellant (Otto Fuel II) and concentrations of HCN further investigation on the estimated volume of HCN in oil ranges from 0.2 mg/L to 5mg/L (which are low levels of HCN) as indicated by several manufacturers and the percent of synthetic oil in the material.

In addition, the condition of the drums encountered can be expected to be poor at best. There may be bulging drums, leaking drums, drums that disintegrate when the surrounding soils, which have been holding them together, are removed and drums that are crushed and have jagged edges.

The physical hazards associated with drum excavation and handling will be minimized by performing as much of the work as practical with heavy equipment. Drums will be carefully excavated and uncovered with an excavator equipped with a bucket/thumb attachment. Drums will be removed from the excavation with the excavator and staged in a temporary staging area established adjacent to the excavation area. The drums will be carefully “picked” out of the excavation by grabbing the drum(s) with the bucket/thumb of the excavator or scooped up with

the bucket. The manner with which they are removed from the excavation will depend on the orientation of the drum and its physical condition. The condition and physical state of the drum(s) will be evaluated by trained and experienced personnel from outside of the excavation limits. If no evidence of leaking or a bulging condition exist, the drum(s) will be “picked out” by the excavator and set in the temporary drum staging area immediately adjacent to the excavation area. Any soils adhering to the outside of the drum(s) will be removed with non-sparking tools (ie: Beryllium shovels). Personnel will attempt to determine if there are any markings on the outside of the drum(s). Drums will be labeled with a unique ID number and photographed. If the drums are in a poor non-transportable condition, they will be lifted by the excavator, or a backhoe, and placed into 85-gallon overpack drums, which will be labeled with the same info as was placed on the drum. If drums are crushed and will not fit into an 85-gallon drum, it may be necessary to place them into a 110-gallon overpack drum. If a drum is uncovered and obviously leaking, it will not be removed from the excavation area prior to being secured in an overpack drum in order to prevent an uncontrolled release of its contents resulting in cross-contamination of the surrounding area. If it becomes necessary for personnel to enter the excavation area, prior to entering any excavation over 4-feet deep, the side slopes will be “benched” by digging a horizontal “bench”, 2 to 3 feet wide, into the sidewall of the excavation. Benches will be dug at 3’ intervals and the number required will depend on the overall depth of the excavation. A 6’ deep hole will have one bench approximately 3’ below grade. An 8’ excavation will require 2 benches, one at 3’ bgs and the other at 6’ bgs. Egress measures, such as a ladder, will be provided in all excavations entered by personnel, and will be provided at 10 foot intervals within an excavation. Only after the excavation has been “made safe” by benching the sidewalls and providing egress, personnel be allowed into it. A nylon sling will be secured around the leaking drum and it will be carefully picked up the excavator and immediately placed into an overpack drum. To reduce exposure or possibly being in contact with the material inside the drum, all personnel inside the excavation will need to egress from the immediate drum location a safe distance (10 feet +/-) until the drum is inside of the overpack. Any material that had leaked out of the drum(s), along with obviously contaminated soil, will be shoveled into the overpack and kept with the source drum. The lid will be secured on the overpack drum and the overpack will be lifted from the excavation with the excavator and transferred to the drum staging area. Real-time air monitoring will be continuously conducted while performing excavation and/or drum removal work.

In determining the level of HCN in the air and to eliminate the explosive conditions, one may monitor the initial level of HCN in the air to eliminate the elevated level necessary for the HCN to reach to become explosive. One may monitor HCN by using a HCN monitoring device (Industrial Scientific T82) that would alarm if the level exceed 10 ppm of HCN. In addition to a real time monitoring device, specific colourmetric tubes (draeger tubes) can be used to determine the level of any HCN in the ambient air near the excavation. The real time monitoring device is more reliable and has less cross interferences (false positives).

4.4 Biological Hazards

Due to the area of concern and the spring and summer conditions, several biological hazards to be aware of are wild and domestic animals, insects (ticks, chiggers, fire ants, bees, hornets, and mosquitoes). The following paragraphs describe potential biological hazards at the Site.

4.4.1 Hazardous Flora

The incidence of human contact with poisonous/thorny plants is high when working in forested or vegetated areas; therefore, bare skin will be covered (i.e., long pants and long-sleeved shirt, boots, leather or cotton gloves, safety glasses, and head protection) as much as practical. Personnel will avoid entering any area in the direct path of known poisonous flora (e.g., poison ivy, poison oak, or poison sumac). Instead a secondary route will be selected. Care must also be taken when walking in areas where uneven terrain or vines may present a tripping hazard. Rashes or other injuries will be reported to the SHSO as soon as they occur or are recognized to have occurred.

4.4.2 Hazardous Fauna

Mosquitoes, flies, and gnats pose a nuisance and physical hazard to field personnel. They can cause accidents when they distract workers and can also pose a health threat through the transmission of microorganisms. Perfumes and scented deodorants can attract these insects and will not be worn by field personnel while on the site. Insects are more attracted to dark colored clothing; therefore, light colored clothing is preferred. Because of the possibility of sample interference, insect repellent will not be used. However, the possibility of insect-borne diseases and individual susceptibility to allergic reactions caused by insect bites necessitates the use of insect repellants. The use of insect repellants [especially those containing N,N-diethyl-met-atoluamide (DEET)] will be noted in the field logbooks. Reasonable care should be taken to control sample contamination.

There is also a potential to come in contact with other dangerous insects at the Site. These include chiggers, bees, wasps, hornets, mites, fleas, spiders, and ticks. All personnel will perform “checks” on themselves periodically and at the end of the work shift. When walking or working in forested or vegetated areas, personnel will be alert to the presence of and avoid encountering elaborate spider webs among trees and bushes. All insect bites must be reported to the SHSO. Personnel must always be aware of individual reactions to bee stings or insect bites. Should an individual start to have shortness of breath and become covered in hives, the person may be having an intense allergic reaction. Medical attention must be sought immediately.

If a tick does become attached, it must be removed immediately upon discovery. Tweezers must be used to ensure the entire head and body of the tick is removed. If the head cannot be removed, medical attention must be sought at the end of the day.

West Nile Virus – This virus has been showing up on the Eastern Coast of the United States since 1999. In 2001 it has been reported in Florida. West Nile encephalitis is an infection of the brain caused by the West Nile Virus, a flavivirus commonly found in Africa, West Asia, and the Middle East. The West Nile Virus is transmitted by mosquitoes and has been commonly found among humans, birds, and other vertebrates in the aforementioned locals. Until 1999, however, the West Nile Virus had not been documented in the Western Hemisphere. In 1999, 62 cases of severe disease, including seven deaths, occurred in the New York Metropolitan area.

BASIC TRANSMISSION CYCLE

The virus is spread through the bites of infected mosquitoes. Mosquitoes become infected when they feed on infected birds, which may circulate the virus in their blood for a few days. Infected mosquitoes can then transmit the West Nile Virus to humans and animals while biting to take

their blood. The virus is located in the mosquito's salivary glands. During blood feeding, the virus may be injected into the animal or human, where it may multiply, possibly causing illness. The West Nile Virus is NOT transmitted from person to person.

SYMPTOMS OF WEST NILE ENCEPHALITIS

All residents of areas where virus activity has been identified are at risk of getting West Nile encephalitis; persons older than 50 years have the highest risk of severe disease.

Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death. The incubation period in humans (i.e., time from infection to onset of disease symptoms) for West Nile encephalitis is usually 3 to 15 days.

Risk Minimization

The following are precautions to minimize mosquito bites and potential exposure to the virus:

- Mosquito activity increases in the dawn, dusk, and early evening hours.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35 percent DEET. DEET in high concentrations (greater than 35 percent) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands of children.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

NOTE: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

4.4.3 Radiation Hazards

The Site has no known sources of ionizing radiation that would harm personnel. Non-ionizing radiation sources are present in the form of ultraviolet light from the sun.

Prolonged exposure of the skin to the sun's ultraviolet rays, even on overcast days, can result in sunburn. Sunburn can become severe enough to be incapacitating, especially for fair-skinned individuals. Repeated sunburn can eventually cause premature aging of the skin and/or skin cancer. Always wear clothing to reduce the amount of exposed skin and use sun block creams or lotions with high SPF ratings such as 45 frequently.

4.4.4 Explosion and Fire

Electrical equipment malfunction (pumps, generators, etc.), fuel storage systems, fuel delivery systems and fuel hose/piping/fittings all present potential explosion or fire hazards. Fuel for construction and excavation equipment will be stored in permanently attached manufacturer installed fuel tanks. Equipment will be fueled from permanently installed tanks that have been installed in the back of the Contractor's trucks. These tanks will be filled offsite as needed. All fuel system components (tanks, hoses, fittings, etc.) will be inspected daily as part of the routine pre-operation inspection performed by the equipment operator. A piece of equipment found to have defective or leaking fuel system components, or any other problems (ie: cooling system, hydraulics, etc.), will be removed from service until the required repairs are completed. All equipment will be equipped with at least one ABC type fire extinguisher. Each Contractor truck or vehicle will also be required to carry at least one (1) ABC type fire extinguisher. The temporary office trailer and decon trailer will also have fire extinguishers conspicuously mounted at each door way. All of the Contractor's personnel have been trained (in-house) in the proper use and selection of fire extinguishers. During the Site Specific Safety Orientation, site workers will be presented with the local Fire safety information, including the NUWC fire department phone number to be programmed into everyone's cell phones. It will be stressed that the first course of action, in any fire emergency, will be to contact the NUWC fire department to get help mobilized to the scene. The second step will be to evaluate the situation to determine if "you" are in immediate danger and then to either remove yourself from the scene or take measures to deal with the emergency, such as using a fire extinguisher to extinguish a fire. It will be stressed in the Site Specific Safety Orientation that personal health and safety is the number one priority in any emergency situation, "we" are not trained fire fighters and ensuring our own safety and that of our coworkers is our main objective. Trying to extinguish a fire is secondary and should only be attempted once everyone is accounted for and a safe distance away.

4.4.5 Potential Chemical Hazards

Potential chemical hazards at the project site are from two sources, the petroleum fuels and lubricants used in construction heavy equipment and vehicles at the site and the compounds associated with the historical use of the site identified during the previous site investigation (SASE). The primary source of chemical hazards that this HASP will focus on is the ones associated with the buried drums and metal debris areas. In addition to the chemical hazards identified during the Study Area Screening Evaluation, the Navy has, and continues to use, Otto Fuel II at the facility. Otto Fuel II is used as fuel for torpedoes and other weapons systems and is routinely used and stored at the Naval Undersea Warfare Center. Another potential chemical hazard exists due to the presence of heavy concentrations of HCN in used oil from torpedo engines. The NUWC tests torpedo engines and may have stored used torpedo engine oil at the NUSC Storage Area.

A site map will be attached to the Hazardous Material Inventory Form, showing the locations of stored hazardous materials.

A spill kit consisting of a spill drum, shovel, broom, and absorbent pads will be located at any hazardous material storage area. Any spills will be immediately reported to the SHSO and CS. The CS will ensure that the appropriate facility and/or local authorities are notified in the case of a spill.

A. Buried Drum Area

During excavation of Test Pit 02, a corroded 55-gallon drum containing a tar-like substance was encountered approximately 6 feet below grade. The drum was removed and disposed of off-site. The only information available at the time of Plan preparation is that the drum with the tar-like material was shipped offsite and manifested as a “State Regulated Oily Solid”. Two additional drums were observed in the test pit, but not removed. VOCs, SVOCs and Metals were detected in the soil gas, soil and groundwater in this area. A summary of the compounds detected is as follows:

Table 4-5 – Buried Drum Area Test Pit Results

Compound	Concentrations (ug/kg)	Compound	Concentrations (ug/kg)
Naphthalene	16,000-1,400,000	Fluoroanthene	1,800-4,500,000
2-Methylnaphthalene	390,000	Fluorene	120-920,000
Acenaphthene	160-1,400,000	Indeno(1,2,3-cd)pyrene	360-820,000
Anthracene	260-1,300,000	Naphthalene	180-1,900,000
Benzo(a)anthracene	750-1,700,000	Phenanthrene	1,200-4,700,000
Benzo(a)pyrene	510-1,400,000	Pyrene	1,400-3,600,000
Benzo(b)flouroathene	510-1,200,000	Arsenic	190-27,000
Benzo(g,h,I)perylene	370-800,000	Iron	920,000-35,000,000
Benzo(k)flouranthene	560-1,100,000	Lead	1,800-17,000
Carbazole	250-770,000	Magnesium	21,000-3,100,000
Chrysene	720-1,500,000	Manganese	4,600-670,000
Dibenzo(a,h)anthracene	290-210,000	Diesel Range Organics	46,000-390,000,000
Dibenzofuran	3700-620,000	Gasoline Range Organics	470-100,000
Diethylphthalate	180-150,000		

B. Buried Metal Container Area

The second area of concern for chemical hazards is the buried metal container area, which was also identified via test pit (TP14) excavation during the previously conducted SASE. A large number of what appears to be deteriorated aerosol paint cans and related debris is evident in the stream embankment in the south west portion of the site. The presence of the metal debris was confirmed through excavation of test pit 14. Elevated levels of lead were found in the vicinity of the metal debris. The horizontal extent of the buried metal containers is unknown at this point in time, but the vertical extent is anticipated to be less than 8’ below ground surface. In addition to lead, other metals were detected in samples analyzed along with some limited SVOCs. A summary of the sampling results from Test Pit 14 are presented in the following Table:

Table 4-6 – Buried Metal Container Area Test Pit Results

Compound	Concentrations (ug/kg)	Compound	Concentrations (mg/kg)
2,4-Dimthylphenol	ND - 310	Aluminum	4,600-14,000
Benzo(a)anthracene	280 - 420	Arsenic	3.6 – 24.0
Benzo(b)flouroathene	220 - 440	Barium	14.0 – 30.0
Benzo(g,h,I)perylene	ND - 290	Chromium	4.7 – 14.0
Benzo(k)flouranthene	230 - 400	Iron	9,800 – 38,000
Bis (2-Ethylhexyl) phthalate	430 – 1,000	Lead	24.0 - 830
Chrysene	320 - 460	Magnesium	1,700 – 3,200
Fluoroanthene	690 - 820	Manganese	170 - 340
Phenanthrene	ND - 440	Mercury	0.0090 – 0.036
Pyrene	590 - 740	Diesel Range Organics	21,000-3,100,000
Aroclor - 1254	55.2	Gasoline Range Organics	4,600-670,000

The results presented in Tables 4-5 and 4-6 were taken from analytical testing result reports from sets of samples collected during the SASE from Test Pit 02 and Test Pit 14. Additional sampling was performed during the SASE of the NUSC Disposal Area, but only the results from Test Pits 02 and 14 exhibited contaminant levels exceeding the limits set forth in either the USEPA Region 9 PRG – Industrial Soil or the RIDEM Soil Direct Exposure Limits for Industrial/Commercials Properties.

The above Tables are felt to be representative of the chemical contaminant levels expected to be encountered during execution of the excavation work and have been used to establish the appropriate level of PPE for the site workers. Although differing site conditions can be encountered on any project, the available data at the time of preparation of this Plan has been used to establish the initial PPE levels and field conditions may dictate or warrant a modification to the selected PPE in order to assure that the site workers are adequately protected.

C. Otto Fuel II

Otto Fuel II is a distinct-smelling reddish-orange, oily liquid that the U.S. Navy uses as fuel in torpedoes and other weapons systems. It is a mixture of three synthetic substances: propylene glycol dinitrate (major component – nitrated ester), 2-nitrodiphenylamine and dibutyl sebacate. Propylene glycol dinitrate is a colorless liquid with an unpleasant odor and is explosive. 2-Nitrodiphenylamine is an orange solid used to control the explosion of propylene glycol dinitrate. Dibutyl sebacate is a clear liquid used for making plastics, many of which are used for food packaging. Otto Fuel II is classified as a stable, liquid monopropellant composed of a nitrate ester in solution with a desensitizing agent and a stabilizer. It is a red free-flowing liquid that is heavier than water. When in a thin layer, such as a spill, stain or leak, Otto Fuel II is a yellow-orange color.

Otto Fuel II is non-corrosive, has an extremely low vapor pressure and high flash point minimizing explosive and toxic hazards. It is classified as a low fire hazard material. Otto

Fuel II typically enters the environment in wastewater from Naval Facilities that produce it or are involved in torpedo operations (NUWC). Propylene glycol dinitrate evaporates rapidly and is believed to be the major cause of symptoms associated with exposure. 2-Nitrodiphenylamine does not dissolve easily in water and may be found in soils and sediments.

Otto Fuel II is an irritant through inhalation, skin contact and eye contact. The most common effect of overexposure is headache and can be accompanied by poor eye-hand coordination, eye irritation, congested noses, nausea, dizziness and difficulty breathing. OSHA and NIOSH has set the REL and/or PEL for Otto Fuel II (Propylene glycol dinitrate) at **0.3 milligrams** per cubic meter of air or **0.05 parts per million**. The primary emergency response to Otto Fuel II exposure is to remove the exposed person from the effected area and provide with fresh air. Oxygen administration may be required, depending on the duration and concentration of exposure. Caffeinated black coffee may be given to persons exposed to Otto Fuel II to alleviate headache pain. Medical attention should be provides () for any workers exposed to Otto Fuel II that experience any of the exposure symptoms.

D. Hydrogen Cyanide (HCN)

Another possible chemical hazard that may be encountered during the execution of the work is Hydrocyanic Acid or Hydrogen Cyanide. HCN is found in high concentrations in used motor oil from torpedo engines. Used motor oil from torpedo testing operations has been stored at the NUSC Disposal Area and there exists a possibility that the unknown buried drums may contain used motor oil.

Hydrogen cyanide is a colorless gas or bluish-white liquid with a bitter almond odor. An air odor threshold concentration for hydrogen cyanide of 0.58 part per million (ppm) parts of air has been reported. Exposure to hydrogen cyanide can occur through inhalation, ingestion, eye or skin contact, and absorption through the skin, eyes, and mucous membranes.

The current Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) for hydrogen cyanide is 10 ppm (11 milligrams per cubic meter (mg/m³)) as an 8-hour time-weighted average (TWA) concentration. The OSHA PEL also bears a "Skin" notation, which indicates that the cutaneous route of exposure (including mucous membranes and eyes) contributes to overall exposure [29 CFR 1910.1000, Table Z-1]. The National Institute for Occupational Safety and Health (NIOSH) has established a recommended exposure limit (REL) for hydrogen cyanide of 4.7 ppm (5 mg/m³) as a STEL. NIOSH also assigns a "Skin" notation to hydrogen cyanide [NIOSH 1992].

Cyanide is a potent and rapidly acting chemical asphyxiant. Hydrogen cyanide can cause rapid death due to metabolic asphyxiation. The organs especially sensitive to cyanide damage are those whose function depends on an adequate supply of oxygen such as the brain and heart. Death can occur within seconds or minutes of the inhalation of high concentrations of hydrogen cyanide gas.

Liquid hydrogen cyanide, hydrogen cyanide in aqueous solution [hydrocyanic acid], and the concentrated vapor are all absorbed rapidly through the intact skin and may cause systemic

poisoning with little or no irritant effect on the skin itself. The liquid in contact with the eye may cause only local irritation; however, the attendant absorption may be hazardous. Industrial exposure to hydrogen cyanide solutions has caused dermatitis, itching, scarlet rash, papules, and nose irritation and bleeding. Perforation of the nasal septum has also occurred.

Acute exposure to cyanide can result in symptoms including weakness, headache, confusion, vertigo, fatigue, anxiety, dyspnea, and occasionally nausea and vomiting. Respiratory rate and depth are usually increased initially and at later stages become slow and gasping. Coma and convulsions occur in some cases. If large amounts of cyanide have been absorbed, collapse is usually instantaneous; unconsciousness; often with convulsions, is followed almost immediately by death.

Remove an incapacitated worker from further exposure and implement appropriate emergency procedures (e.g., those listed on the Material Safety Data Sheet required by OSHA's Hazard Communication Standard [29 CFR 1910.1200]). All workers should be familiar with emergency procedures, the location and proper use of emergency equipment, and methods of protecting themselves during rescue operations.

5.0 TRAINING

5.1 Introduction

TN&A requires that all employees involved with the operation of heavy equipment and the management of hazardous materials have a thorough knowledge of potential occupational hazards. In addition, all employees are specifically trained in proper work procedures and how to eliminate or mitigate potential exposure (i.e., OSHA Hazardous Waste Operations and Emergency [HAZWOPER] 40-hour and 8-hour refresher training).

TN&A personnel are required to attend frequent, formal training sessions during their entire employment with the company. The following outline represents the corporate-mandated training that is required of all personnel and subcontractors working on a construction/remediation project.

In addition, subcontractor personnel conducting asbestos abatement activities are also required to have specific core training and annual refresher training.

5.2 Basic Safety Training

Personnel are required to attend an initial 40-hour classroom training session, meeting requirements of 29 CFR 1910.120 and 1926.65, focusing on chemical and physical hazards when projects are associated with hazardous waste operations and emergency response. Other training subjects include proper work procedures, hazard communication, hearing conservation, PPE, respiratory protection, and first aid/CPR for designated individuals. Heavy equipment operators are also given training on the equipment they are to be operating on the project.

5.3 Refresher Training

Regular 8-hour refresher training in compliance with 29 CFR 1910.120 and 1926.65 is provided to employees annually.

5.4 Supervisory Training

All supervisory personnel will have attended an 8-hour supervisor's course in compliance with 29 CFR 1910.120 and 1926.65 when projects deal with hazardous materials.

5.5 Safety-Orientation Briefing

All TN&A employees and subcontractors who perform field work during the project will be required to read this HASP and acknowledge receipt and understanding of this HASP by signing the HASP Acknowledgement Agreement in Appendix B, and submitting it to the TN&A Project Manager before performing any field activities. Any visitors to the site will also be required to read this HASP and sign and submit the HASP Acknowledgement Agreement.

An initial site safety briefing will also be held for all TN&A employees, subcontractors, and site visitors. This briefing will include, at a minimum:

- A review of the Project Hazards, and other pertinent sections contained within this HASP;

- A review of posted hazard warnings and permits applicable to the worker or visitor during site access;
- A review of hazards which may be encountered on-site during that particular day or site visit;
- Site Security Measures; and
- Emergency assembly points and notification procedures.

During the initial Site Safety Orientation, the HSO will prepare copies of all site workers H&S Training Certificates and ensure that everyone is up to date with training prior to being allowed to work on the site. Copies of training certificates will be submitted to the ROICC along with the signed HASP Acknowledgement Agreements.

5.6 Daily Safety Briefings

The TN&A SHSO will conduct and document a daily safety briefing of approximately 5-10 minutes duration. These meetings will be conducted at the beginning of the scheduled work shift and will address safety and health issues pertaining to the upcoming daily operations. This briefing (commonly known as a “tailgate safety meeting”) will accompany and complement the briefing of the daily work activities. Attendance will be documented on the Daily Safety Briefing Checklist found in the Appendices. Copies of the daily safety briefing will be maintained at the job site.

5.7 Hazard Communication

Site-specific hazard communication will be provided on-site by the SHSO. Chemical data sheets will be maintained on-site for the chemical contaminants of concern and process chemicals to be used on site and for any hazardous materials purchased for use at the Site. The labeling provisions of 29 CFR 1910.1200 will be followed on the Site.

5.8 Subcontractor Training

All subcontractors entering the project area will certify that their employees have successfully completed the training as stated in Section 5.1 through 5.7 above before undertaking Site work. Such certification must include documented evidence that each subcontractor employee has completed site safety orientation training conducted by the TN&A SHSO. The HASP Compliance Agreement must be signed by the subcontractor’s employees prior to commencement of work. The submittal of contractor personnel health and safety training and medical surveillance clearance documentation must accompany the compliance agreement. This agreement form is located in Appendix A.

Additional subcontractor health and safety training documentation required prior to the commencement of the project is the subcontractor’s site-specific activity hazard analysis for those tasks that they will be performing under this scope of work.

This certification record will be stored in the field along with other documents. Additional job-specific, on-site training and safety briefings, as discussed in the other sections, will be

performed and documented by TN&A. All relevant project training documentation will be submitted to the ROICC for documentation purposes.

5.9 Visitor’s Briefing

All Site visitors who will be in the work area only for short periods of time will be briefed by TN&A personnel. The visitor’s briefing will include the hazards associated with the Site, emergency procedures, and the use of PPE.

5.10 Heavy Equipment Operator’s License

It is a State of Rhode Island requirement that all operators of heavy equipment be properly “licensed”. Personnel mobilized to the site to operate heavy equipment will be required to provide proof of a valid “equipment operators license” prior to being allowed to “work” in that capacity. Copies of licenses will be provided to the Navy ROICC along with the *Site Safety and Health Plan Compliance Agreement*.

6.0 PERSONAL PROTECTIVE EQUIPMENT

Selection of appropriate PPE will be based on the safety and health hazards identified at the job site. The required safety equipment and clothing must be available on the site before work is to begin. At a minimum, PPE will consist of standard work clothes (shirts with long sleeves and pants), standard eye protection, steel toe boots, gloves, hard hats and high visibility safety vest. Workers involved with tasks that are generating significant amounts of dust, that cannot adequately be controlled with dust suppression, may be required to wear dust masks and/or respiratory protection. The SHSO will determine the need for respiratory protection utilizing real time air monitoring equipment with TWA calculation capabilities.

Work conducted in the immediate vicinity of operating heavy equipment (within 30 feet) will require hearing protection. Prior to transporting or handling hazardous material the SHSO and employees will review the MSDS. The SHSO and/or the Corporate SHM will determine PPE required for employees transporting or using hazardous material.

6.1 Mobilization and Site Preparation

Mobilization and Site Preparation activities will be performed in Level D PPE. Additional PPE may be required for specific tasks such as chain saw operation (chaps, face shield) and working around loud equipment (ear plug/muffs).

6.2 Buried Drum Area Excavation and Drum Handling, Drum Overpacking and Sampling

Due to the unknown nature of the two (2) additional drums that were observed in Test Pit 02 during the previous SASE, initial excavation, handling, overpacking and sampling of the unknown drums will be performed in **Level B PPE**. Excavation equipment will be equipped with breathing air bottle racks, regulators and low-pressure audible alarms. Workers will wear chemical resistant coveralls (Tyvek), gloves and overboots. Ground support and sampling personnel will either wear a SCBA or be plugged into an air bottle cascade system via an air hose. All breathing air systems will be equipped with low-pressure audible alarms. Individuals entering an excavation to facilitate the overpacking of obviously leaking drums within the limits of the excavation area will also be in Level B PPE. Real time air monitoring with a PID or FID will be conducted during all excavation and drum handling activities.

6.3 Buried Metal Container Area Excavation

Initial excavation of the buried metal container area will be performed in **Modified Level D PPE** consisting of chemical resistant coveralls (Tyvek), gloves and boots. Based upon the sampling results from Test Pit 14, the primary contaminant of concern in the buried metal container area is Lead. The exposure pathways for Lead will be through direct contact with impacted soils/debris and through ingestion or inhalation of lead containing dust. If excavation activities are generating appreciable amounts of dust that cannot be controlled, the SHSO may require the utilization of respiratory protection. The anticipated duration of the excavation phase will not be long enough to quantify any possible exposure through personal air sampling, so the worst case will be assumed and the level of PPE will be adjusted accordingly.

Modeling potential dust exposure levels was conducted using the “Safety Now – Dust Exposure Calculation Worksheet” (Marlow, 2004). The highest soil contamination levels of lead, manganese and mercury were inputted into the model. This data is found in Section 4.4.3 in Table B – Buried Metal Container Area Test Pit Results. The results of the modeling indicate the Dust Exposure Level at the Mixture PEL = 10.920 mg/m³.

This result indicates that a dust concentration of 10.920 mg/mg³ needs to be achieved before the respective PELs of lead, manganese and mercury will be reached. This is a very high level of dust.

A conservative action level selected for this project for (respiratory) nuisance dust is 3.0 mg m³.

6.4 Backfill and Topsoil Placement

The placement of previously excavated soils that has been “field screened” and determined to be “clean”, will be performed in Level D PPE. Placement of imported “certified clean” fill and topsoil will also be performed in Level D PPE.

6.5 Excavated Soil and Debris Sampling

Collection of samples for waste (soil & debris) characterization and offsite disposal will be performed in **Modified Level D PPE**, consisting of chemical resistant coveralls, gloves and boots. Soils and debris stockpiles, removed from the Buried Drum Area, will be monitored with a PID. If air monitoring results warrant an upgrade of PPE, appropriate respiratory protection will be utilized.

6.6 Soil and Debris Loadout

Loadout of impacted soil and debris will be performed in **Modified Level D PPE**, consisting of chemical resistant coveralls, gloves and boots. The loading operation, with emphasis on the loader operator, will monitor with a PID. If air monitoring results warrant an upgrade, respiratory protection will be utilized.

6.7 Site Restoration and Demobilization

Site restoration and demobilization activities will be performed in Level D PPE. Additional PPE may be required for specific tasks such as chain saw operation (chaps, face shield) and working around loud equipment (ear plug/muffs).

7.0 MEDICAL SURVEILLANCE PROGRAM

7.1 Purpose

The purpose of a medical surveillance program is to provide uniform medical care, ensure the selection of employees physically able to safely perform the work assigned, monitor employee health on a regular basis, and provide medical care for occupational injury or illness. This program applies to all TN&A employees and subcontractors. Specific requirements of the program are described below.

7.2 Medical Evaluation

All personnel involved in on-site operations must participate in an ongoing medical surveillance program meeting the requirements of OSHA 29 CFR 1910.95, 1910.120 and 1910.134. The first examination will be conducted before personnel begin working at the Site. The medical surveillance protocols and examination results will be overseen by a licensed physician certified in Occupational Medicine by the American Board of Preventive Medicine or who, because of necessary training and experience, is Board-eligible. The baseline medical examination for the project will include the following:

- Complete medical and occupational work history,
- General physical examination,
- Complete blood count,
- Electrocardiogram,
- Urine analysis with microscopic examination,
- Pulmonary function test,
- Chest X-ray,
- Audiogram,
- Visual acuity measurement,
- Ability to wear respirator, and
- Stress test for employees over 40 years of age.

This requirement will be strictly enforced for TN&A personnel, as well as all subcontractor personnel. However, personnel currently participating in a medical surveillance program (with yearly medical examinations), which meets the requirements of 29 CFR 1910.120 relative to specific Site conditions, will not be required to have additional medical surveillance. Based on the results of this examination and other pertinent information, a medical certification as to the fitness for employment on this project, or any restrictions on that employee's ability to utilize PPE will be maintained at the Site. However, specific medical examination results will be maintained in strict confidence and will not be subject to disclosure without the explicit written approval of the employee. Beyond the general medical surveillance requirements listed above, no other chemical-specific requirements are applicable to TN&A employees based on historical data from previous projects and reasonable expectations of potential exposures at this Site. These requirements will be revised accordingly if data reveal that chemical-specific action levels are being exceeded.

7.3 Annual Examination

Each TN&A employee who may be potentially exposed to hazardous chemicals, or who must wear a respirator for more than 30 days per year, and is exposed to occupational noise will receive an annual examination consistent with the baseline examination aforementioned.

7.4 Employee Notification of Medical Examination Results

Dr. Jerry Berke, a licensed and experienced physician certified in Occupational Medicine by the American Board of Preventive Medicine, at Health Resources (a national medical surveillance program provider in Woburn, MA) will review the results of the medical evaluation. If the examination uncovers a serious health problem, the employee is contacted and also notified in writing by a case nurse at Health Resources. Health Resources also recommends that the employee see his/her family doctor. If the condition is more serious the case nurse from Health Resources will notify TN&A's health and safety manager. If the health condition is pertaining to the job, Health Resources will conduct follow-up monitoring.

7.5 Lost-Time Injuries/Illnesses

The occupational physician will evaluate any employee who loses time due to a workplace injury or illness during the period of the contract. The physician will complete appropriate forms and provide the supervisor with a copy, clearing the employee for return to work. Reports of all such accidents will be maintained at the Site.

7.6 Records

Accurate medical records will be maintained by the occupational physician in accordance with 29 CFR 1910.120. Employees will be permitted access to all medical records following the procedures outlined in 29 CFR 1910.20 and TN&A's Health and Safety Procedures

8.0 EXPOSURE MONITORING AND AIR MONITORING PROGRAM

8.1 General

Monitoring for the presence of hazardous conditions will be performed by the SHSO during work in order to prevent personnel exposure to chemical and physical hazards. Information gathered from air monitoring would be used to determine appropriate on-site protective measures and to design appropriate contingency plans and/or control measures to limit off-site migration of contaminants. Monitoring activities and equipment are described in the following sections. All monitoring results will be recorded in the permanent log of all activities.

8.2 Direct-Reading Monitoring Instruments

Unlike air sampling devices that are used to collect samples for subsequent analysis in a laboratory, direct-reading instruments provide information at the time of sampling, enabling rapid decision-making. Data obtained from the real-time monitors are used to ensure proper selection of PPE, engineering controls, and work practices. Overall, the instruments provide the user capability to determine if Site personnel are being exposed to concentrations that exceed exposure limits or action levels for specific hazardous materials.

Monitoring instruments for this soil removal action have been selected based on the potential contaminants of concern at the project location, and also based on the planned work to be conducted. The monitoring instruments selected include a photoionization detector (PID) for total organic vapor monitoring, a HCN monitoring device that would alarm if the level exceed 10 ppm of HCN or colourmetric tubes (draeger tubes) to determine the level of any HCN and a digital dust indicator for fugitive dust monitoring.

Air monitoring instruments shall be calibrated before and after each period of use in accordance with manufacturer's instructions and standard industrial hygiene practice. Readings shall be recorded in the Equipment Calibration Log (Appendix D). In addition, background levels for total organic vapors and ambient particulate matter will be measured and recorded in the field log book. These readings, any influencing conditions (e.g. weather, temperature, humidity) and location will also be documented in the field log book as a matter of reference. Any positive instrument responses observed above determined background levels will be considered to indicate contaminant release. As such, the following actions will be taken:

- Monitor work areas continuously, concentrating on worker breathing zone areas (head and face regions). If readings are observed at these areas to be at background levels, continue monitoring and work activities.
- If breathing zone readings are above background, workers are to retreat to an unaffected area.
- If background levels are regained, work can resume with continuous monitoring of instrument usage.
- If background levels are not regained, the SHSO shall determine what controls are necessary to permit work to resume (i.e. upgrading respiratory protection and PPE).

8.3 Air Monitoring and Action Levels

TN&A will furnish and maintain real-time air monitoring equipment including a Combustible Gas Meter (CGM), Photo Ionization Detector (PID), Miniram Dust Meter and HCN monitoring device for verification of safe atmospheres at the two excavation areas.

Action Levels are defined as follows:

Oxygen	19.5% to 23.5% (outside these parameters – SAR/ESCBA systems are to be used)
Flammable gases/vapors	>10% LEL – existing permit trigger level (USACE requirements: >5% ventilate or eliminate source, >10% suspend hot work activities, >20% evacuate work area
Hydrogen Sulfide	>10 ppm (notify employees – SAR/ESCBA systems are to be used).
Hydrogen Cyanide	>10 ppm (notify employees – SAR/ESCBA systems are to be used).

Model of CGM: ALM Logic 600 series 4 gas monitor (or equivalent)

A Photoionization Detector (PID with 10.2 eV lamp, or equivalent that will detect the wide variety of ionization potentials for the contaminants detected at the site) will be utilized. All action levels, as expressed herein, are above background, which will be established prior to commencement of work. The baseline study will consist of real-time monitoring for organic vapors.

Model of PID: HNU Systems Model PI-101 (or equivalent)

A Hydrogen Cyanide and hydrogen sulfide meters will also be provided to monitor buried drums for the presence of HCN.

Model of HCN Meter: Industrial Scientific- T82 Single Gas Monitor

8.3.1 Organic Vapors

Instrument

- PID (with 10.6 eV lamp)
- FID VERIFY

Frequency

- Every 2 hours (at morning startup, after morning break, after lunch, after afternoon break, all prior to resuming activities)
- Immediately after “unusual” events or incidents that raise exposure concerns

- Continuous during intrusive activities

Location of Readings

- In breathing zones of site personnel conducting intrusive sampling activities, conducting cleaning activities, conducting pumping activities, and conducting waste consolidation activities.

Monitoring Methods and Action Levels are presented in Table 8.1.

**Table 8.1
Monitoring Methods and Action Levels for
Uncharacterized^a Mixtures Using Screening Survey Instruments**

Hazard	Method of Screening	Action Level^b	Protection Action
Total organic vapor	PID or FID	Background to 2ppm >2 ppm >5 ppm >10 ppm >50 ppm	No action required Air-purifying respirator, full-face, Level C protection with appropriate cartridges. Air-purifying respirator, full-face, Level C protection, personnel monitoring required to identify contaminants. Supplied air protection, Level B STOP WORK
Combustible Gas	Explosimeter or FID	<10% LEL >20% LEL	No Action Start continuous monitoring; permit only classified electrical equipment and non-sparking tools STOP WORK, ascertain source of gas
Oxygen Concentration	Oxygen analyzer	<19.5% v/v 19.5 to 20.5% v/v 20.5 to 21.0% v/v >22.0% v/v	Leave area, evaluate reason for deficiency, monitor again remotely of with IDLH entry program. Slight deficiency, continue continuous monitoring. Normal range Elevated reading, check calibration, investigate cause, STOP any potential spark-producing activity
Total Airborne Dust	Real-time aerosol monitor	< 7.0 mg/m ³ (non respiratory)	No action

*Naval Facilities Engineering Command - Northeast
IR Site 08 – NUSC Disposal Area Soil Removal Action, Naval Undersea Warfare Center, Middletown, RI
Health and Safety Plan Revision 2*

		<3.0 mg/m ³ respiratory >7.0 mg/m ³ non-respiratory < 3.0 mg/m ³ respiratory	Implement dust suppression methods, Air-purifying respirator, full-face, Level C protection with appropriate cartridges.
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Notes:

^a carcinogenic and highly toxic materials not verified absent from the atmosphere

^b all action levels are readings observed above background; verify absence of highly toxic compounds as necessary (e.g., vinyl chloride, methylene chloride, benzene)

Acronyms/Abbreviations

- FID – flame ionization detector
- IDLH - immediately dangerous to life and health
- LEL – lower explosive limit
- mg/m³ – milligrams per cubic meter
- PID – Photoionization detector
- ppm – parts per million
- v/v – volume per volume

8.3.2 Industrial Hygiene Exposure Monitoring

If total organic vapors are present in the air as detected by a PID or FID in concentrations exceeding 50 ppm for sustained periods, the SHSO may require the SHSO to conduct integrated industrial hygiene exposure monitoring. This may include colorimetric detector tube sampling and organic vapor monitor (OVM) sampling. This monitoring will provide objective data to demonstrate the select contaminant concentrations in the air and the comparisons to the established occupational exposure limits.

If total dust readings exceed 7.0 mg/m³ non-respiratory (particulates greater than 5 micron. Or 3.0 mg/m³ for respiratory (particulates less than 5 microns in size) The one to be conservative with would be in the breathing zone and use the 3.0 mg/m³ respiratory action limit which is sustain for over one minute in the breathing zone. One can use the 7 mg/m³ for periods near the cause of the dust for sustained periods, the SHSO may require the SHSO to conduct integrated industrial hygiene exposure monitoring for metals exposure.

Where monitoring is required for the initial determination, it may be limited to a representative number of employees who are reasonably expected to have the highest exposure levels. If there have been any employee complaints of symptoms which may be attributable to exposure to total organic vapors or if there is any other information or observations which would indicate employee exposure to total organic vapors, this must also be considered as part of the initial determination.

If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the established action levels, all efforts will be taken to protect the employees from further exposure. These measures may include engineering controls, personal protective equipment, and administrative controls.

8.4 Data Logging and Record Keeping

All real-time air monitoring data will be recorded in a log book to include:

- Date and time of monitoring
- Air monitoring location
- Instrument, model number, serial number
- Calibration and background levels
- Results of monitoring
- Personnel signature
- Interpretation of data by SHSO.

This log book will be made available to anyone on the site that request to look view the contents, including but no limited to site workers, ROICC and NUWC personnel. The SHSO will report to the project team each morning the air monitoring results from the previous days activities and if any modification to procedures (ie dust control) or PPE are warranted.

8.5 Work Stoppages

Total Organic Vapor Levels

- A PID or FID reading of >50 ppm as a sustained peak for 15-minute period

Response – Evacuate Exclusion Zones. The TN&A SHSO will contact the TN&A’s PM immediately. The ROICC, the TN&A PM, and the TN&A Corporate SHSO must be notified to evaluate the situation and determine the next course of action.

Oxygen Levels

- >20% LEL

Response - STOP WORK, ascertain source of gas

Combustible Gas

- >22.0% v/v

Response - Elevated reading, check calibration, investigate cause, STOP any potential spark-producing activity.

In all cases the TN&A SHSO will contact the TN&A’s PM immediately. The ROICC, the TN&A PM, and the TN&A Corporate SHSO must be notified to evaluate the situation and determine the next course of action.

8.6 Calibration Procedures

All field calibration of monitoring equipment will follow manufacturer’s procedures as listed in the operations manuals, which are kept with each piece of equipment. A standard calibration gas of 100 ppm isobutylene will be employed for monitoring equipment calibration for the PID. The real-time aerosol monitor will be calibrated in accordance with manufacturer’s instructions. The

Field Equipment Calibration Data Sheet enclosed in Appendix E will be used to document the calibration results.

8.7 Field Data Sheets and Logs

The Air Monitoring Field Data Sheet enclosed in Appendix E will be used to document air-monitoring activities on an as-needed basis.

9.0 STANDARD OPERATING SAFETY PROCEDURES AND CONTROLS

All Site personnel shall follow the following general operating procedures. These precautionary measures are designed to reduce the risks of inadvertent or accidental chemical exposure or injury during on-site operations.

9.1 Personal Precautions

- Be familiar with standard operating procedures and adhere to all instructions and requirements in the HASP.
- Eating, drinking, chewing gum, chewing tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any contaminated or potentially contaminated area. However, a supply of cold water and disposable cups will be located in the decontamination area such that employees will have access to water with only removal of gloves, hat, and respirator and washing of face and hands.
- Hands and face must be thoroughly washed upon leaving the work area. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.
- No facial hair, which interferes with a satisfactory respirator fit of the mask-to-face seal, is allowed on personnel required to wear respirators.
- Avoid contact with contaminated or suspected contaminated surfaces. Whenever possible, avoid walking through puddles, pools and mud. Avoid kneeling or sitting on the ground, equipment, or steel drums.
- Personal articles shall be prohibited in any contaminated or potentially contaminated area.
- Medicine and alcohol can exacerbate the effects from exposure to toxic chemicals. While field operations are in effect, alcoholic beverage intake should be minimized or avoided during off-work hours. Prescribed drugs should not be taken by personnel on-site operations where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Do not work when ill.
- Avoid downwind positions during Site activities to reduce potential contaminant exposure.

9.2 Operational Requirements

9.2.1 General Requirements for All Levels

- All work shall be in Level D unless otherwise noted. Air monitoring for VOCs and particulate matter will be conducted by the SHSO to assist in determining the appropriate PPE for work activities.
- The SHSO shall conduct daily safety and health inspections to determine if operations are being performed in accordance with this HASP, OSHA, and any other pertinent regulations and contract requirements.
- All personnel working at the Site shall be adequately trained and thoroughly briefed on anticipated hazards, equipment to be worn, safety practices to be followed, emergency

procedures, and communications. The SHSO shall conduct daily health and safety meeting prior to work at the Site.

- In the event of an accident, the appropriate TN&A personnel (specifically, the Project Manager) shall immediately notify the activity POC (Steve Grenade (805-989-3806)). If appropriate, within two working days of any reportable accident, the TN&A SHSO and the Project Manager shall complete and submit an Accident Report form..
- Unless part of the project work, drums and containers are not to be disturbed. This restriction does not apply to IDW drums or containers. If any drum and/or container is leaking or bulging, the SHSO and the Activity POC (Steve Grenade) must be notified immediately.
- Report all injuries or work related illnesses to the SHSO or supervisor as soon as possible.

9.2.2 Requirements for Level C

- Respiratory protective devices and protective clothing appropriate to the designated levels of protection shall be worn by all personnel going into areas designated for wearing protective equipment. All TN&A personnel and their subcontractors will conform to the requirements of their Respiratory Protection Program or OSHA 29 CFR 1910.134, whichever is more stringent.
- Personnel should practice unfamiliar operations prior to doing the actual procedure.
- Entrance and exit locations shall be designated and emergency escape routes delineated. The following warning signals shall be used when necessary:
 - * Hand gripping throat — Can't breathe
 - * Grip partner's wrist or both hands at waist — Leave area immediately
 - * Hands on top of head — Need assistance
 - * Thumbs up — OK, I'm all right, I understand
 - * Thumbs down — No, Negative
- Communications will be maintained between field team members within all zones at all times. The SHSO shall maintain a warning device such as a vehicle horn or portable signal horn to alert field team members to emergency situations
- Personnel and equipment in the contaminated area shall be minimized, consistent with effective Site operations.
- Decontamination procedures for leaving a contaminated area shall be followed. Hands and face shall be washed prior to work breaks and eating and drinking. Work areas and decontamination procedures have been established based on expected Site conditions.

9.3 Subcontractor Safety and Health Plans

Although safety and health is the responsibility of all personnel working at the Site (including subcontractors), TN&A has the primary responsibility of implementing the HASP. TN&A will review the subcontractor's HASP to see if there are any deficiencies or conflicts between the HASPs. Any deficiencies or conflicts should be resolved before starting the field activities. The SHSO has the authority to evaluate, correct, and take corrective actions where subcontract personnel do not follow the approved HASP.

10.0 SITE CONTROL MEASURES

10.1 General

This section details the setup of the Site into the various work zones. To minimize the possibility of exposing unprotected personnel and the translocation of contaminants, several measures will be taken. These measures include:

- Setting up security or physical barriers to exclude unnecessary personnel from the general area,
- Minimizing the number of personnel and equipment on-site consistent with effective operations,
- Establishing work zones within the Site,
- Establishing control points to regulate access to work zones,
- Conducting operations in a manner to reduce the exposure of personnel and equipment,
- Minimizing the airborne dispersion of contaminants, and
- Implementing appropriate decontamination procedures.

10.2 Work Zone Definitions and Site Security

As long as the level of protection required is level D or modified level D, one work zone is sufficient. However, if the level of protection is upgraded to level C, an exclusion zone, contamination reduction zone, and support zone will be established. These zone designations are defined as follows:

Exclusion zone (EZ) is defined as the area where contamination is either known or likely to be present, or because of activity, will provide a potential to cause harm to personnel. Entry into the exclusion zone requires the use of personal protective equipment.

Contaminant reduction zone (CRZ) is the area where personnel conduct personal and equipment decontamination. It is essentially a buffer zone between contaminated areas and clean areas. Activities to be conducted in this zone will require personal protection as defined in the decontamination plan. A requirement for all site workers and visitors entering the CRZ/EZ to log-in/log-out from the site anytime anyone enters the CRZ/EZ to assist when emergency evacuation is necessary under the evacuation plan/

Support zone is situated in clean areas where the chance to encounter hazardous materials or conditions is minimal. Personal protective equipment is not required in the support zone, but should be available in case of emergency.

If these zone designations are required, they will be established using yellow “Caution” tape and delineated as follows:

- The exclusion zone will be the immediate area of release or spill. For this CTO, an exclusion area could potentially be established along the periphery of an affected Test Cell, or around a staging area for equipment and supplies.
- The contaminant reduction zone would establish a margin between the caution tape (exclusion zone) and the staging area. In this area, donning and doffing of any required PPE, and other decontamination would be exercised.

- The support zone will be established where there is no potential contact with site contaminants. However, PPE would be available here in case site conditions change and require an upgrade.

Once the work in exclusion zones is completed, and the contaminant reduction zone is controlled, the areas must be restored to their former condition and site security classification. The SHSO will be responsible for clearing the area from site control, and the SHSO will document this approval in the field log book.

The work zones are depicted on the proposed site plan located in Appendix E.

11.0 PERSONAL HYGIENE AND DECONTAMINATION

11.1 General

At the end of a daily shift and whenever leaving the a work area where contact with hazardous chemical has been a possibility or personnel have been working in established Exclusion Zones, all personnel will be required to remove protective equipment and discard disposable garments. All wash water will be containerized for proper handling and disposal. At the end of the shift, all personnel will clean themselves and change into clean clothes, if necessary, before leaving the Site.

11.2 Donning Personal Protective Equipment

The following procedures will be followed for putting on PPE (when required):

- All employees working in the EZ will have PPE available as described in Section 7.2, Modified Level D.
- All employees will be trained in the use of any PPE necessary to perform their duties.
- If protective suits, boots, and gloves are prescribed by the SHSO, employees shall tape the gloves and boots to the protective suit to prevent contamination from penetrating the space between the protective suit and the gloves and boots.
- If respirators are prescribed by the SHSO, the respirators will be thoroughly inspected prior to donning the respirator. New cartridges will be installed. A positive/negative fit check shall be performed each time the respirator is donned.

11.3 Doffing Personal Protective Equipment

The following procedures will be followed for removal of PPE (when required):

- Before leaving the work area, knock off all heavy soil from gloves and boots.
- Proceed to the hot line personnel decon pad. Step into the boot wash station, wash gloves and boots, and wipe off the respirator if necessary.
- After leaving the boot wash station, remove outer tape, boots and gloves. Throw tape and gloves away in designated containers.
- Remove outer boots and hang them on the boot rack (respirator still on).
- Proceed to remove the outer suit and place in the designated container.
- Remove inner boot liners and outer gloves and throw away in the designated container.
- Once clear of decon station, using inner gloves, remove respirator (if used) and throw cartridges into the designated container (throw cartridges away at the end of shift).
- Wash respirator, then remove inner gloves, and throw into the designated container.
- Hang up the respirator to dry (towel dry and bag at the end of shift).

11.4 Personal Hygiene/Sanitation

A portable bathroom and wash facility will be provided at the Site.

All employees working in the EZ will follow the rules established below. Employees found to be disregarding the rules will be barred from the Site.

- Eating, drinking, chewing gum, chewing tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in the EZ. An exception to this policy will be allowed by having hand/face washing facilities and Gatorade at the decontamination pavilion. This exception is to help prevent heat-related illness from wearing PPE in warm weather.
- Hands, face, and forearms must be thoroughly washed upon leaving a contaminated or suspected contaminated area before eating, drinking, or performing any other activities that might involve hand-to-mouth contact thereby increasing the potential of ingesting contaminants.
- Employees will be required to clean themselves including the washing of hair (only if required), at the end of each shift.
- Removal of materials from protective clothing or equipment by blowing, shaking, or any other means that may disperse materials into the air, will be prohibited.
- Any skin contact with groundwater should be avoided.

11.5 Medical Emergency Decontamination Procedures

The following procedures are to be used for providing emergency medical treatment to personnel sustaining injury while working in the exclusion area of the Site.

The procedures are to be used by Site/safety personnel, emergency medical staff/ambulance crew members, and hospital emergency room staff ONLY when the nature of the medical emergency supersedes standard operating procedures for chemical decontamination when exiting the exclusion area for the chemical hazards associated with this Site.

The potential chemical hazards at the Site are volatile and semi-volatile organics, including chlorinated compounds, petroleum hydrocarbons, and heavy metals in the soil and groundwater. The primary acute chemical hazards are generally from low-level, direct dermal exposure, typically only causing a skin rash upon exposure. Although specific contaminants, by nature, must be dealt with on a case-by-case basis, these procedures generally will be followed:

Injury With Potential for Contact with Lightly Contaminated Clothing; Uncontaminated Skin

An initial assessment of the injured person will be performed first, to determine if the employee has suffered a spinal/head injury. Potential spinal/head injuries may require PPE to be left on the injured employee. If the initial assessment does not provide evidence of a spinal/head injury, all protective clothing (hard hat, outer boots, and gloves) will be removed by personnel at the Site before the injured person is transferred to an ambulance. This can be performed anywhere on-site although when at all possible, it should be performed at the hot line, break area, or emergency exit. Standard untaping and washing procedures may be eliminated if necessary. Protective clothing may simply be removed to minimize cross contamination. In extreme circumstances, protective clothing may be removed by cutting it with a scissors or a knife. This emergency clothing removal takes less than one minute to perform and virtually eliminates the chances of contaminating any emergency vehicles, emergency staff, and emergency room facilities. Pre-surgery preparation for the injured person would consist of normal soap and water rinsing.

Injury Involving Potential for Contact with Contaminated Outer Clothing; Uncontaminated Skin

The same procedure as above should be used. The staff performing the emergency clothing removal will be required to thoroughly decontaminate themselves after the incident.

Injury Involving Potential for Contact with Contaminated Clothing; Contaminated Skin

None of the contaminants reasonably expected from this Site are acutely hazardous or toxic at the “trace” levels (i.e., that which would be soaked into or onto clothing).

The guidance for transporting contaminated victims may include preparing the ambulance by covering the exposed areas of the ambulance with visqueen. Specific requirements may be based on hospital and ambulances protocol. When transporting the patient, level C or B may be required depending on the EMS protocol. When it is unknown, follow the more stringent conditions, visqueen the ambulance, all EMT or paramedics should be in level C or level B depending on the chemicals involved. Pre site meeting local fire department and EMS will determine the exact protocol which will be incorporated into the HASP as an amendment..

12.0 EQUIPMENT DECONTAMINATION

12.1 Levels of Protection

Personnel engaged in decontamination activities will be in the same PPE level under which the work was performed.

12.2 Temporary Decon Pad

A temporary decon pad will be constructed adjacent to the Buried Metal Container Area and is indicated on Figure 3 - Proposed Work Area Layout (Appendix E). The small size of the Buried Drum Area should allow the safe operation of excavation equipment without having the tracks come in contact with any contaminated soils thus eliminating the need to decontaminate the tracks prior to moving over to the Buried Metal Container Area. The only part of the excavator contacting contaminated soils, during the Buried Drum Area excavation, should be the bucket and end of the dipper stick, which will be brushed off, or wrapped in plastic, prior to leaving the area. The buried metal container area is wider than the effective reach of the excavator and tracking into the excavation area and coming in contact with contaminated soils may be unavoidable.

The temporary decon pad will be constructed with 6-mill poly sheeting and timbers will be used to protect the integrity of the plastic while moving heavy equipment across the decon pad. The decon pad will be for “dry sweep” method only and therefore no water, or the containment of water, is anticipated. Soils will be swept and scrapped from the surface of the excavation and loading equipment. Operation of equipment in a manner to limit contact with contaminated soils will be enforced during the execution of the work. Certificates of decon (per EM 385-1-1) will be required and will be completed by the SHSO. A copy of a TN&A Certificate of Decontamination is attached in Appendix C.

13.0 EMERGENCY RESPONSE AND CONTINGENCY PLAN

13.1 Introduction

This Emergency Response and Contingency Plan will be implemented at the Site to prevent or to minimize the impacts of unplanned events that could threaten the safety and health of Site personnel or the local community. The plan considers the following types of events:

- Employee injury/illness,
- Fire/explosion,
- Environmental release, and
- Miscellaneous (e.g., severe weather conditions, adverse community action).

13.2 Emergency Phone Numbers and Incident Report

Section 13.17 contains the list of emergency telephone numbers established for this project. TN&A's Incident Report (IR) call list will be used to report any incident covered by TN&A's IR Procedures. An incident will be called in to one person, starting at the top of the list, on the day of the incident. A copy of TN&A's Incident Report can be found in Appendix C.

13.3 Emergency Medical Care

13.3.1 First Aid

All TN&A employees, designated as responsible for rendering first aid or medical assistance, shall be included in the TN&A Bloodborne Pathogen Exposure Control Program in accordance with 29 CFR 1910.1030. These employees shall also be instructed in the sources, hazards, and avoidance of bloodborne pathogens. These employees will also be provided, use, and maintain personal protective equipment (gloves, gowns, masks, eye protectors, and/or resuscitation equipment) when appropriate for rendering first aid or other medical assistance to prevent contact with blood or other potentially infectious materials (OPIM).

13.3.2 Blood Decontamination

Any equipment contaminated with blood or OPIM will either be bagged in a red biohazard waste bag or decontaminated in place. Personnel that have been trained in the Bloodborne Pathogen Exposure Control Program must conduct the clean-up activities. Decontamination of large equipment in place will be conducted using a disinfectant solution consisting of no less than the equivalent of one quarter (1/4) cup of sodium hypochlorite bleach to one (1) gallon of water.

13.3.3 Emergency Response Coordinator

Minor Injuries: In the case of minor injuries, the injured person will be transported to by the designated 1st Aid Responder in a Company vehicle to the **Newport Hospital**.

Major Injuries: For serious or life-threatening injuries, the Emergency Response Service will be notified immediately by the SHSO. The injured person should be treated for shock and control of severe bleeding, if necessary, by qualified first-aid trained personnel. **Do not transport the injured employee unless emergency responder dispatch personnel indicate by telephone communication that it is safe to transport the injured employee.**

At least two (2) persons, certified in first aid and CPR by the American Red Cross (or equivalent) and trained in the Bloodborne Pathogens criteria as required by 29 CFR 1910.1030, will be present at the project site at all times when work is being conducted.

13.4 Medical Providers

In the event of an on-site injury requiring emergency medical care or emergency response, the following medical center will be used:

**Newport Hospital
11 Friendship Street
Newport, RI 02840
(401) 846-6400**

TN&A will be utilizing the Resident Physician(s) and/or On-Call Staff at Newport Hospital.

Figure 2 in Appendix E provides directions and a map to this hospital.

NOTE: When contacting the 911 emergency medical care services by cellular telephone inform the dispatcher that the call is originating from the Naval Undersea Warfare Center, provide nearest cross street and/or building number.

The local 911 emergency care service in Middlesex, RI has been notified of the project at the NUSC and of the specific hazards that may be encountered to ensure that if the injured person(s) may be contaminated, care will not be rejected.

TN & A Health and Safety Manager, William S. Fink, CIH, CSP, CHMM has verified that all emergency medical service and emergency response telephone numbers are in service prior to the commencement of work at the site. Mr. Fink is the primary point of contact in the event of any medical emergencies in order to facilitate proper medical care, insurance coverage, accident investigations and employee return to work.

13.5 Lost-Time Injuries/Illnesses

Dr. Jerry Berke, MD, with Health Resources in Woburn, MA, a board certified occupational physician, will evaluate any TN & Associates, Inc. employee who loses time due to a workplace injury or illness during the period of the contract. Dr. Berke will complete appropriate forms and provide the ROICC with a copy and clear the employee for return to work as appropriate. Reports of all such accidents will be maintained at the Site

13.6 Lines of Communication

13.6.1 Emergency Response Coordinator

The TN&A SHSO will also be the Emergency Response Coordinator (ERC). He will direct response activities and have responsibilities for mitigation and clean up. He will have responsibilities for the safety of Site personnel and other responders. The ERC will have the authority to cease any response activity if the safety of responders, Site personnel, or the community is threatened. The ERC's duties will include:

- Maintaining emergency preparedness,
- Performing Site inspections and informing subcontractors of work activities and emergency response plans,
- Coordinating with emergency services prior to and during an emergency response scenario, and
- Informing TN&A personnel of the Site status as per the incident.

Additionally, the ERC will be responsible for coordinating communications with off-site agencies and personnel once initial notifications have been made.

13.6.2 Emergency Warning Systems

Several warning systems will be utilized at the Site depending on the work Site or emergency involved:

- Verbal communications,
- Radio communications,
- Vehicle horns,
- Portable, hand-held, compressed gas horns, and
- Telephone.

If an emergency arises requiring an evacuation, the SHSO, or designated alternate, will sound the horn. Horn signals will be used to signify an emergency warning. NUMBER OF HORN BLASTS	RESPONSE
1	Power equipment shut down/Await further instruction
2	Injured person/Notify supervisor and SHSO immediately; Begin appropriate medical treatment as necessary
3 (followed by a continuous long blast)	Evacuation from a work area (radio communications will then be used to determine need for Site evacuation after a head count is passed among safe sites)

13.7 Evacuation Plan

Specific plans for evacuation from the Site will vary depending on the phase of the work being performed and the location. Safe meeting areas after Site evacuation will vary depending on the work phase. They will be indicated on the Site maps maintained in the field and will be discussed during daily safety meetings. All Site personnel and visitors will be informed of the evacuation plan and meeting places during Site orientation (See Map Location for Egression Locations).

The function of the log-in/log-out from the EZ requirement includes both CRZ and the EZ not only to facilitate a head count in the event of an emergency evacuation/event, but also to have a record of site personnel that may have been potentially exposed

Egression Routes

To determine a proper egression for an on site emergency, The SHSO should be prepared to contact personnel on site via radio and by a predetermine horn alarm indicating that all site personnel need to meet at a predetermined egression area. The following safety activities and information need to be conducted for the evacuation plan to work properly. Note the following:

- Remember that site exclusion zone documents need to be update. All personnel on site going into the exclusion zone are required to check in and check out of the exclusion zone upon entering and exiting the exclusion zone. This will assist in determine who has entered the CRZ and EZ along with determine the possible exposed personnel.
- All personnel shall be conducting the “Buddy System” when conducting any activities on site.
- Proper PPE shall be worn inside the exclusion as indicated in this HSP.
- All personnel on site shall log in for the day once they arrive and prior to the daily safety meeting at the command post. Everyone departing the site should remember to sign out.

Horn Alarm Activation:

On Site Egress

The warning alarm as designated in the previous table is three short blast of the air horn or vehicle and one continuous blast for evacuation. Upon hearing the evacuation signal (three horn blasts followed by one continuous blast), employees will check the surroundings to determine wind direction. Whenever possible, evacuation should be in the direction perpendicular to the wind direction without passing through the plume or smoke cloud, if any. Emergency egress points will be on the Site map maintained in the field and discussed in the Site-specific orientation with all employees and visitors.

Once the horn is heard personnel will immediately exit the hot zone through the decontamination zone for a quick decon and immediately proceed to the predetermined on site egression location. The personnel responsible for decontamination assistance will review the hot zone entry and exit log to determine that all personnel checked out of the exclusion zone, The personnel will then proceed to the on site egression location. The SHSO will bring the site entry log and perform a count of personnel on site.

On Site Egression Location

The on site egression location will be near the main entrance of the site near the command post or may change due to the wind direction. The information will presented during the daily tailgate safety meeting.

Off Site Egress

The SHSO or designated site personnel will alert all site personnel by three blast of the air horn or a vehicle horn. The personnel will follow the same procedures as the On Site Egression but

will meet off site at a predetermined area. The predetermined area for the off site egression location is marked on the location map and depends on the wind direction.

Each Site supervisor not involved in response activities will account for employees within his/her charge at the meeting area and report the information to the SHSO. The SHSO will check the supervisor's lists against the sign-in log and will notify the Project Manager of any discrepancies. The evacuation map will be clearly posted in command post and in the decon areas.

13.8 Emergency Prevention, Recognition and Response

Site personnel and visitors will be instructed in the recognition of Site emergencies and their duties in notification/warning

Employee Injury/Illness

Prevention - The provisions of the HASP will be followed to prevent employee injury and illness. Contact local authority for information and discuss site activities with local ER and first responders prior to site activities and discuss scenarios for evacuation, emergency medical assistance and where the ER crew would like to be located or what they request for the personnel to be prior their arrival (total decon, quick decon, or contained). Discuss routes and pickup procedures along with contact personnel.

Recognition - Employees who have been exposed to Site contaminants without the use of respiratory protection will report the exposure to their supervisor and the SHSO. Employees who feel they are suffering symptoms of exposure to Site contaminants or have suffered an injury will also report to their supervisor immediately. Employees should observe each other for signs and symptoms of exposure to Site contaminants and other environmental stress. Such signs may include:

- Skin discoloration,
- Excessive perspiration,
- Lack of coordination,
- Staggered gait,
- Sleepiness/dizziness/drowsiness,
- Incorrect responses, and
- Irritable or irrational behavior.

Employees should also report all injuries, even ones they consider minor.

Response - If an injury occurs due to an accident or exposure to a hazardous substance, the SHSO will be immediately notified by radio. The SHSO will be given all appropriate information concerning the nature and cause of the injury so that treatment preparations can be initiated. The TN&A Project Manager will be informed and will investigate the cause of the injury and make any necessary changes in work procedures.

Personnel Injury in the Exclusion Zone: Upon the notification of an injury in the EZ, work activities shall cease and an assessment of the injured person will be performed. If it is a Site emergency, all personnel will assemble at the pre-designated safe area on the Egress Route. If it is a local problem, the personnel in that work area will evacuate to the decontamination zone. If the injured party(s) can be evacuated without further injury, they will be brought out

immediately. Otherwise, a stretcher will be obtained to evacuate the injured party(s). The nature of the injury will be evaluated and the affected person will be decontaminated to the highest extent possible prior to movement to the support zone. The appropriate first aid will be administered and contact will be made for an ambulance with the designated medical facility (if required). No persons will re-enter the EZ or work area until the cause of injury or symptoms is determined.

If the injury is the result of chemical exposure, an assessment of potential airborne contaminant concentration will be performed using field instrumentation. Rescue will be done in a level of protection appropriate for the anticipated airborne contaminant concentrations. Emergency decontamination procedures are described in Section 13.0, “Personal Hygiene and Decontamination.” These procedures will be given to the local ambulance and emergency room personnel.

Personnel Injury in the Support Zone: Upon notification of an injury in the support zone, the SHSO will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of the Site personnel, operations will continue with the appropriate first aid and necessary follow-up as stated above. If the designated emergency signal (continuous horn blast) is sounded, then all Site personnel will move to the pre-designated, safe re-assembly points for further instructions. Activities at the Site will stop until the added risk is removed or minimized.

13.8.1 Emergency Equipment

The following emergency first-aid equipment will be available at the Site and accessible to all personnel.

- An industrial first aid box with biohazard kit.
- Emergency eye wash station meeting ANSI Z-358-1-2003 criteria capable of providing not less than 1.5 liters per minute (0.4 gallons) of potable water to the eyes for a minimum of 15 minutes
- One 2A-10 B: C type, dry chemical fire extinguisher for each piece of equipment and one at each door of each trailer set up onsite. (3 to 4 minimum).

The above units will be setup each day in close proximity to work activities. These will be shown on the Site map and discussed in the initial Site orientation.

13.9 Fire/Explosion

Prevention - The primary goals of fire prevention and protection measures are:

- To control ignition sources, and
- Early detection and rapid response.

The following guidelines will be followed at the Site to achieve these goals:

- Smoking will be prohibited on-site except in designated areas **approved by NUWC**.
- No welding, open flame, or spark-producing operations will be allowed on-site unless evaluated and approved by the SHSO.

- Recognition - All fires and visible smoke will be reported at once to the Site Supervisor who will report to the Project Manager.
- Response - In the event of fire or explosion, Site evacuation procedures will be implemented and emergency response services will be notified.

TN&A personnel will only attempt to extinguish small incipient fires (e.g., fires that can be extinguished with available portable fire extinguishers). In the event of larger fires, TN&A will notify the proper authorities and evacuate the Site in accordance with the Emergency Response and Contingency Plan.

Only approved (by a nationally recognized testing laboratory) containers and portable tanks shall be used for the storage of flammable and combustible liquids. Metal containers and portable tanks (less than 660 gallons individual capacity) shall meet the requirements of Chapter I, Title 49 of the Code of Federal Regulations (U.S. DOT Hazardous Materials Regulations), Chapter 9 of the United Nations Rules for Transportation of Dangerous Goods, or NFPA 386, *Standard for Portable Shipping Tanks for Flammable and Combustible Liquids*. Plastic fuel containers shall meet one or more of the following specifications: ANSI/ASTM D3435, *Plastic Containers (Jerry Cans) for Petroleum Products*; ASTM F 852, *Standard for Portable Gasoline Containers for Consumer Use*; ASTM F 976, *Standard for Portable Kerosene Containers for Commercial Use*; ANSI/UL 1313, *Nonmetallic Safety Cans for Petroleum Products*.

13.10 Environmental Release

Prevention - The Environmental Protection Plan is designed to prevent significant environmental releases from the Site. In addition, the Spill and Discharge Control Plan will be implemented to prevent or mitigate escape of contaminants from the Site.

Recognition - Visual observations of leaking pipes or containers or puddles of unknown liquids will be reported immediately to the Site Supervisor who will report the incident to the Project Manager.

The primary recognition tool for air releases is the air-monitoring program. Monitoring procedures and action levels described in the “Exposure Monitoring and Air Monitoring Program” section of this HASP will be followed.

Response - Response to an environmental release will involve cessation of operations, notification of the contracting officer and appropriate federal, state and local agencies, and implementing the appropriate spill or dust control plans. For air releases, off-site evacuation will be the responsibility of local authorities after notification by the Project Manager.

13.11 NUWC HERO Emissions Control

HERO is the acronym used at the Naval Undersea Warfare Center for “*Hazards of Electromagnetic Radiation to Ordnance*” and it employed to control the use of radio frequency generating equipment at the Center. Such equipment could have adverse effects on tests being run on ordnances at the Center, such as torpedoes. In extreme situations, the use of radio frequency generating equipment could result in the detonation of ordnance, which could put many of the NUWC personnel at risk. Due to the potential of extreme situations, TN&A will not perform any work during ordnance testing periods and depending on the length of time that

testing is being performed, may evacuate the site. Ordnance testing scheduling and compliance with HERO Emission Control requirements will be coordinated between the ROICC and the NUWC Explosives Safety Officer, Mr. Joe Branco (401-832-6998).

13.12 Miscellaneous

Prevention - TN&A will take reasonable measures to secure the Site and Site employees against other events such as severe weather conditions and adverse community activity. Such preventive measures will include securing temporary office and storage facilities, grounding of buildings and electrical systems, and implementation of a security plan.

Recognition - Any forecasts of severe weather conditions or indications of adverse community activities (e.g., threats, vandalism, pickets, etc.) will be reported immediately to the Project Manager.

Response - All outdoor work will cease during lightning in the area. The safety of work in high winds or other severe weather conditions will be assessed by the SHSO. Any decision to cease operations will be reviewed by the activity POC.

TN&A will not respond to any adverse community situation other than to try to obtain as much information as possible and to report that information to the activity POC (Steve Grenade), or in the event of an emergency, to the local authorities.

13.13 Incident Reporting

TN&A will follow its corporate incident reporting procedure detailed in the Section 4.0: Accident and Crisis Management Program of the TN&A Corporate Safety and Health Manual. In addition, the client will be notified of all incidents covered by this section immediately, and will receive copies of any incident reports within 24 hours.

13.14 ROICC Notification

The Navy ROICC must be notified within four (4) hours of any accident, incident or injury. The Navy ROICC will provide the Contractor with a copy of the *Contractor Significant Incident Report (CSIR)* and instruction for proper completion. The completed CSIR must be submitted to the ROICC within 24 hours of an incident.

13.15 Daily Pre-Work Meetings

The daily pre-work meeting is designed as a briefing that addresses the hazards specific to each day's work activities. The SHSO will address any concerns or potentially dangerous situations, prior to the start of each workday, in order to prepare the emergency situations and prevent worker injuries (see Daily Tailgate Safety Meeting Form). These meetings will generally include the following information:

- Weather report,
- Work plan,
- Levels of PPE for each task to be undertaken,
- Special hazards and environmental issues which may arise from new tasks, and

- Correction of health and safety violations.

The following emergency first-aid equipment will be available at the Site and accessible to all personnel.

- An industrial first aid box with biohazard kit.
 - An emergency eye wash station. Solution will be available in sufficient quantity to ensure the capability of at least 15 minutes of flushing. The station will be designed to meet ANSI Z-358.1-1998 criteria capable of providing eye wash solution in capacity of not less than 1.5 liters per minute (0.4 gallons) of potable water to the eyes for 15 minutes.
 -
- One 2A-10 B: C type, dry chemical fire extinguisher.

The above units will be setup each day in close proximity to work activities. These will be shown on the Site map and discussed in the initial Site orientation.

At least two persons certified in first aid/CPR will be on-site at all times during construction activities. The SHSO and CS will also be certified in first aid/CPR. The SHSO will provide on-site personnel with first-aid procedures including heat stress, cold stress, shock, accident prevention, heart attack, and stroke.

13.16 Emergency Telephone Numbers

The local emergency contacts are:

- Emergency requiring Police, Fire or Ambulance **911**
- LEPC, District 7 (Lt. Tom Geoff) (401) 846-7888
MFD Middletown, RI.
- Navy On-Scene Coordinator (Commanding Officer - Captain Robert McLaughlin) (401) 841-3715
- Newport Hospital (401) 846-6400
- National Response Center Oil/Chemical Spills (800) 424-8802
- Poison Control Center (Local) (401) 444-5727
- Poison Control Center (National) (800) 222-1222
- Chemtrec (800) 424-9300

For contacting Corporate or site personnel once the initial emergency contacts are conducted. The following personnel need to be notified of any emergency situation:

Project Manager (Joe Clifford)	Cell: (610) 505-9315 Office: (610) 431-9584
Construction Superintendent (Chris Miller)	Cell: (609) 709-7395 Office: (609) 296-0952
Site Safety and Health Officer (Jeremiah Johnson)	Cell: (215) 989-0800 Office: TBD
Corporate Safety and Health Manager (William Fink, CIH, CSP, CHMM)	Office: (414) 607-6779 Pager: (888) 662-5705

13.17 Incident Reporting Call List

If you have an incident which involves require emergency personnel, immediately contact the local emergency numbers and then the corporate numbers along with the client.(highlighted, bold areas require emergency contacts:

- **Spill**
 - **Release**
 - **Fire**
 - **Explosion**
 - **Personal injury (more than first aid)**
 - **Highway accident**
- Corporate and client contacts**

- Non-TN&A personnel
- Coverage or publicity
- Possible insurance company action
- Damage to TN&A property
- Regulatory agency notice of violation

IMMEDIATELY CONTACT one of the following personnel starting at the top of the list:

Table 13-1 – Incident Reporting Call List

Name	Work Tel. No.	Home Tel. No.	Pager/Mobile No.
1. Chris Miller	(609) 296-0952	(609) 296-3529	(609) 709-7395
2. Joe Clifford	(610) 431-9584	(610) 431-9584	(610) 505-9315
4. William Fink	(414) 607-6779	(414) 476-8379	(888) 662-5705

If the incident is reportable to outside regulatory agencies, notify the individuals listed in items #1 or #2 in the table above.

The primary client contact is: Mr. Martin Kawa - ROICC

Naval Station Newport, Newport, RI
(401) 841-1569

The alternate client contact is: Mr. Robert Krivinskas – Project Manager

Naval Facilities Engineering Command (NAVFAC)
Naval Station Newport, Newport, RI
(401) 841-1761

14.0 LOGS, REPORTS, AND RECORDKEEPING

TN & Associates, Inc and all IR Site 08 – NUSC Disposal Area subcontractors shall maintain logs and reports sufficient to document the implementation and execution of the personnel protection program and other relevant areas of this HASP. This documentation shall consist of medical surveillance files, training files, daily logs, and accident reports. These field forms should be filled out on a regular basis.

14.1 Exclusion Zone Entry Log

An *Exclusion Zone Entry Log* will be made available at the CRZ for all persons entering the exclusion zone. Site personnel will be required to “sign in” and “sign out” each time an entry into an “exclusion zone” is made. This procedure will be enforced and will be of utmost importance in an emergency situation in order to achieve an accurate “head count” for site personnel. The SHSO will be responsible for enforcing this policy and the entry log will be an attachment to the Daily H&S Report. A copy of the *Exclusion Zone Entry Log* is included in Appendix C.

15.0 HAZARD COMMUNICATION

To comply with 29 CFR 1910.1200, Hazard Communication, the following excerpt from the TN&A written Hazard Communication Program as incorporated into this HASP. All employees will be briefed on this program and have a written copy for review.

15.1 Container Labeling

All containers received on the site will be inspected to ensure the following: (1) all containers will be clearly labeled as to its contents; (2) the appropriate hazard warnings will be noted; and (3) the name and address of the manufacturer will be listed.

All secondary containers will be labeled with either an extra copy of the original manufacturer's label or with generic labels that have a block for identification and blocks for the hazard warning.

15.2 Material Safety Data Sheets

Copies of MSDS sheets for all hazardous chemicals known or suspected on the site and for all chemicals brought onto the site such as decontamination chemicals, gasoline and other fuels, equipment calibration gases, etc. will be maintained in the work area. MSDS will be available to all employees for review during each work shift. In addition to MSDS, the Hazardous Material Inventory Form will be used to inventory hazardous materials to be introduced to the site, with estimated quantities, will be made available to all employees. The Hazardous Material Inventory Form and MSDS sheets for materials that the Contractor plans to bring onto the NUWC site must be submitted to the ROICC prior to site mobilization. This is required such that NUWC Safety Department can review the list of materials to ensure that no prohibited materials are brought onto NUWC property and also to provide NUWC Safety Department the information necessary to ensure the protection of NUWC personnel from the Contractor's activities.

15.3 Employee Training and Information

Prior to starting work, each employee will attend a health and safety orientation and will receive information and training on the following:

- An overview of the requirements contained in the Hazard Communication Standard, 29 CFR 1910.1200
- Chemicals present in their workplace operations
- Location and availability of a written hazard program
- Physical and health effects of the hazardous chemicals
- Methods and observation techniques used to determine the presence or release of hazardous chemicals
- How to lessen or prevent exposure to these hazardous chemicals through usage of control/work practices and personal protective equipment
- Emergency procedures to follow if they are exposed to these chemicals
- How to read labels and review MSDS to obtain appropriate hazard information
- Location of MSDS file and hazardous chemical list

16.0 EXCAVATION PLAN

16.1 Purpose and Scope

To provide protection against workplace hazards associated with trenches and open excavations for all persons at T N & Associates, Inc. (TN&A) locations.

The primary scope of the IR Site 08 – NUSC Disposal Area Soil Removal Action project is the excavation and removal of the two (2) potential contaminant source areas (Buried Drum and Buried Metal Container Areas) identified during the previously performed SASE. These two areas have been identified during test pit excavation and the planned excavation limits have been established, but are subject to increase if additional drums or metal debris is encountered that extends beyond the dimensions established for the project

16.2 Excavations and Trenches

16.2.1 Permits

Before any excavation work begins, all required permits shall be obtained in advance of planned work. The required *Naval Station Dig Safe Form* shall be completed and submitted to the ROICC no later than **five (5) days prior to planned excavation work**.

16.2.2 Dig Alert

Before any excavation or demolition work begins, the existence and location of underground utilities such as water and gas pipes, electrical conductors, telephone and cable lines, etc., must be determined by the Contractor. *The dig safe call number for Rhode Island is 1-888-DIG-SAFE (344-7233)*. The Dig Safe Confirmation number will be required in order to complete the Naval Station Newport specific *Naval Station Dig Safe Form*. *Additional information from blue prints maybe required to determine if any additional lines are located near the excavation area.*

16.2.3 Cave-In Protection

The walls and spaces of all excavations and trenches more than four feet deep, which will be entered by people, shall be guarded by shoring, sloping of the ground, or some other equivalent means, in accordance with OSHA regulations.

16.2.4 Daily Inspections

The Contractor shall make daily inspections of excavations including soil inspection to determine if any of the excavated areas that maybe manned have no accumulated stagnant water or there were no cave-in conditions throughout the excavation. If there is evidence of a possible cave-in or slide, all work in the excavation shall cease until the necessary safeguards have been taken to stabilize the excavation sidewalls and prevent further cave-ins.

16.2.5 Egress

Trenches and excavations more than four feet deep shall have ladders or steps located so as to require 10 feet or less of lateral travel between means of access.

16.2.6 Backfill

All trenches and excavations shall be backfilled as soon as practical after work is completed and all associated equipment removed.

16.2.7 Housekeeping

All Contractor equipment and materials shall be kept out of traffic lanes and access ways. Equipment shall be stored in a manner that ensures the safety of Navy, TN&A and Contractor employees at all times.

16.2.8 Excavation Perimeter Protection

All trenches and excavations shall be completely guarded on all sides. Standard guardrails are preferred; however, when wooden or metal barricades are used for trench guarding, they shall be spaced no further apart than 20 feet, and at least two feet from the edge of the trench. Such barricades shall be at least 36 inches high when erected. Battery-lighted barricades shall be used as follows:

- A minimum of two battery-lighted barricades shall be used at corners, one on each side of the barricade.
- At least one battery-lighted barricade shall be used where vehicular traffic approaches the trench at right angles.
- Where trenches parallel a roadway, the distance between battery-lighted barricades shall not exceed 40 feet unless this requirement conflicts with Item 1 (above), and additional units are required.
- All battery-lighted units shall be serviced as necessary to ensure equipment is operating.
- Caution tape shall be stretched securely between barricades. The caution tape shall be at least 3/4-inch-wide and shall be yellow or yellow and black and may have the words "CAUTION - DO NOT ENTER."
- Barricaded sections immediately adjacent to where pedestrians cross trenches shall be arranged to direct pedestrians to the walkway or bridge.

16.2.9 Encroachment

Use of other trench excavating equipment, or storage of equipment or supplies within a distance equal to the depth of the trench will not be permitted without approval by the TN&A representative.

16.3 Planned Excavation Activities

16.3.1 Buried Drum Area

During excavation of Test Pit 02, a corroded 55-gallon drum with a tar-like substance (State regulated oily solids) was removed and disposed of off-site. The drum was located approximately six (6) feet below ground and two (2) additional drums were observed in the sidewalls of the test pit, but not removed. The location of the removed drum had been staked and its location documented and recorded by a licensed surveyor. The current scope of work requires the uncovering and removal of the two (2) additional drums that were observed in the test pit and the removal of any other drums located within a 15 foot radius of the staked location of

the initial drum, down to a depth of 6 feet below the ground surface. Excavation shall not extend below the groundwater table, except as necessary to remove a drum(s). Excavated soils shall be “field screened” using a PID, FID, olfactory and visual methods to determine the presence of contamination. If contamination is suspected, the soils will be transferred to the soils staging area for further evaluation, sampling and offsite disposal. If “field screening” does not suspect that the soil is contaminated, it will be staged adjacent to the excavation area, in compliance with OSHA, U.S. EPA, and RIDEM requirements, and reused as backfill. The sidewalls of the excavation are to be excavated at a 1:1 slope. The angle of slope will be dependent on the type of soil, for example, if the soils are hard clay (Type B) then the angle of slope will be a 1:1 ratio, but if the soils are type C soils then the angle of slope will be a 1.5:1 ratio (34 Deg) as stated in 29 CFR 1926 Subpart P App B located in Table B-1. In addition, if the excavation is conducted and the area is open for 24 hours or less, a simple slope can be generated for the specific type of soil.

A monitoring well (MW01B) is present within the limits of the Buried Drum Area and is to be protected by the Contractor, as well as any other wells located with the NUSC Disposal Area.

It is estimated that up to 96 cubic yards of soils and up to 10 drums may be removed from the buried drum area. It is further estimated that approximately 8 tons of the soils excavated may require transfer to the soil staging area for sampling, analysis and offsite disposal.

16.3.2 Buried Metal Container Area

Other findings of the SASE included a large number of buried deteriorated metal containers that are possible empty aerosol paint cans in the stream embankment in the south west portion of the site and confirmed through test pit excavation (TP14) in this area. Elevated concentrations of lead were found co-located with these containers and in the stream sediments downstream as far as the NUWC Pond. The horizontal extent of the buried metal container area is unknown, but the vertical extent is anticipated to be less than 8 feet below ground surface

The identified Buried Metal Container Area will be excavated in order to uncover and removed the mixed soil and deteriorated metal containers (soil/debris) discovered in the Test Pit 14 excavation and observed in the northern embankment of Deerfield Creek. The location of Test Pit 14 has been staked and recorded by a surveyor. The extent of the buried metals containers will be determined during this soil removal action. The following area will be excavated as part of the base scope of the project:

- 3 feet from the asphalt parking lot to the northeast of TP-14,
- 10 feet from the light pole located to the southeast of TP-14,
- up to the temporary erosion control structures installed along Deerfield Creek to the southwest of TP-14.

Excavation shall not extend below the groundwater table, except as necessary to remove a metal container(s). Excavated soils shall be “field screened” using a PID, FID, olfactory and visual method to determine the presence of contamination. If contamination is suspected, the soils will be transferred to the soils staging area for further evaluation, sampling and offsite disposal. If “field screening” does not suspect that the soil is contaminated, it will be staged adjacent to the excavation area, in compliance with OSHA requirements, and reused as backfill. The sidewalls of the excavation are to be excavated at a 1:1 slope (see previous excavation information on slopes).

An estimated 189 cubic yards of soil and debris may be excavated at the buried metal container area based on an assumption that the excavation area will be 30 feet wide, excavated in a slope starting 3 feet west of the edge of pavement, 10 feet north of the light pole south of TP-14 and terminating at the edge of the stream channel. The excavation is estimated to be a maximum of 8 feet below ground surface and it is further assumed that all of the excavated materials (284 tons est.) will require transport and disposal at a RCRA C Facility.

16.3.3 Soil and Debris Staging Area

Excavated and relocated soils and debris will require segregation and staging in a contained area to prevent cross-contamination of the ground surface and the migration of potentially impacted materials to non-impacted areas from wind and erosion actions. The staging area will require an impervious liner be placed on the ground surface as well as containment berms. Soils and debris will be segregated into 50 cubic yard (maximum) piles for sampling and characterization. A 4-point composite sample will be collected from each stockpile and analyzed for a Full TCLP, TPH and any other disposal required analyses. Soil and debris stockpiles will be covered with poly sheeting in order to contain any odors generated, prevent saturation and also to prevent erosion by wind and rain.

16.4 Excavation and Soil/Debris Handling Hazards

There are several physical hazards associated with excavation and handling of soils and debris if proper safety procedures are not followed. These hazards include the following:

- Encountering live utilities, either above or below ground (electric, gas, water)
- Rolling over of excavation and soil handling equipment
- Falling and tracking into excavations or holes
- Being struck by excavation and/or soil handling equipment

16.4.1 Control of Excavation and Soil/debris Handling Hazards

All of the above hazards can effectively be controlled with proper training, planning, safety equipment and communication. The utilities can be identified, located and shut down utilizing the required “Dig Safe” program. The number of persons in the immediate vicinity of active demolition activities will be limited and the immediate area cordoned off. Equipment operators will be required to familiarize themselves with the area and any sharp changes in grade, steep slopes, etc. prior to initiating excavation activities.

The excavation and soils/debris handling equipment used will be equipped with appropriate safety shields and all windows will be kept closed. In addition, all equipment will be equipped with operation audible motion alarms. Equipment will be inspected daily and if motion alarms are not properly functioning, the affected piece of equipment will not be used until the motion alarm is repaired. Persons in the immediate vicinity of excavation operations will be limited and appropriate PPE and reflective safety vests will be mandatory.

16.4.2 High-Visibility Safety Vest

All persons within an area where earthmoving equipment is operating shall wear a high-visibility safety vest or jacket at all times. Vests may be red, orange, or day-glo green in color, but bright or fluorescent orange is preferred. Significantly faded or damaged vests must be replaced.

16.4.3 Communication

Good communication is one of the keys to any successful project. Much potential construction related accidents and incidents can be prevented if adequate communication is implemented and maintained. TN&A will conduct a “tool box” safety meeting each morning prior to initiating the days field work. These meetings are an effective “communication tool” that permit the project team to discuss the days planned activities, associated hazards, review required PPE, equipment and materials. The morning “tool box” meeting also provides a forum to discuss the previous days activities, any problems identified and proposed solutions.

An informed project team is more successful in executing the days planned events and are less likely to find themselves in a potential safety situation because they were not aware of what is going on around them. This will also benefit the team by identifying where demolition activities and abatement activities will be taking place and those area(s) can be avoided by other project team members.

- a) Communicating with Equipment Operators – effective and clear communication between ground persons and an individual operating a large piece of demolition or excavation equipment is critical to the safety of the persons on the ground. Most, if not all, large construction equipment have significant “blind spots” and the frequent erratic and unpredictable movements of a piece of equipment can be particularly hazardous to a person on foot in the vicinity of such an activity. Due to the danger associated with approaching a piece of operating construction equipment, it is paramount to make eye contact with the operator and convey your intentions to him/her, through the effective use of hand signals or a 2-way radio, prior to entering into the “swing radius” or close proximity of the machine. It is also the responsibility of the operator to be aware of his/her surroundings, but it is much more critical to the person on the ground to make sure that he/she has the operator’s attention. Cordoning off the area and limiting access to active work areas will also help protect workers from the hazards associated with the operation of large construction or excavation equipment.

The utilization of 2-way radios is also an effective means of maintaining open lines of communication. The outbreak of the cellular telephone revolution has also increased the number of communication options for persons working in the field. Although the use of cell phones by field crewmembers in active work zones is prohibited (to limit distractions of crew members), the emergency use is permissible.

NUWC HERO Conditions: The use of 2-way radios and cellular telephones during NUWC HERO conditions will not be permitted. During NUWC HERO conditions, transmitting devices can cause detonation of explosive devices in the area. It will be paramount that the navy ROICC informs the Contractor of scheduled NUWC HERO activities such that full compliance with this very important safety condition is achieved and maintained.

16.4.4 Open Excavations

Personnel shall clearly demarcate and isolate the open excavation(s) to prevent accidental falls. The open excavation(s) shall be marked using barrier tape, flagging or isolated with temporary orange construction fencing.

17.0 LEAD CONTROL PLAN

17.1 Lead Hazards

Lead is a highly toxic metal that produces a range of adverse health effects in humans. There are many ways in which humans are exposed to lead: through deteriorating paint and dust, air, drinking water, food, and contaminated soil. Airborne lead enters the body when you breathe or swallow lead particles or dust once it has settled. Lead can leach into drinking water from certain types of plumbing materials (lead pipes, copper pipes with lead solder, and brass faucets) and can also be found on walls, woodwork, and the outside of your home in the form of lead-based paint. Lead can be deposited on floors, windowsills, eating and playing surfaces, or in the dirt outside the home.

Lead taken internally in any of its forms is highly toxic; the effects are usually felt after it has accumulated in the body over a period of time. The symptoms of lead poisoning are anemia, weakness, constipation, colic, palsy, and often a paralysis of the wrists and ankles. Exposure to excessive levels of lead can cause brain damage; affect a child's growth; damage kidneys; impair hearing; cause vomiting, headaches, and appetite loss; and cause learning and behavioral problems. In adults, lead can increase blood pressure and can cause digestive problems, kidney damage, nerve disorders, sleep problems, muscle and joint pain, and mood changes.

Red lead (Pb_3O_4), a scarlet, crystalline powder formed by oxidizing lead monoxide, is the pigment in **paint** used as a protective coating for structural ironwork and steelwork.

Exposure to lead is estimated by measuring levels in the blood (micrograms per deciliter). The Centers for Disease Control and Prevention (CDC) has set a level of concern at 10 micrograms per deciliter. Present-day treatment of lead poisoning includes the administration of calcium disodium ethylenediaminetetraacetic acid, or EDTA, a chelating agent; lead is removed from the body by displacing the calcium in EDTA and forming a stable complex that is excreted in the urine.

Lead has been identified in the samples collected from both Test Pit 02 (Buried Drum Area) and Test Pit 14 (Buried Metal Container Area). Although at detectable levels in TP-02 (1.8 – 17.0 mg/kg), only the samples collected from TP-14 exceed the USEPA Region 9 and RIDEM limits for Industrial Sites (750 and 500 mg/kg respectively). The Lead levels identified in TP-14 range from 24.0 to 830 mg/kg.

17.2 Control of Lead Hazards

The lead present in the samples analyzed from the NUSC Disposal Area is in such a “form”, that if appropriate engineering controls are applied, there should be minimal hazards to site workers and the surrounding environment, associated with the presence of the lead.

The potential release of lead containing dust and soils will be minimized through the use of the following engineering controls:

- Proper Employee Training
- Excavation and Soil Handling Methods to Minimize Generation of Dust and Distribution of Lead Containing Soils and/or Debris

- Utilization of Appropriate Dust Suppression (i.e.: water hose)
- Proper Soil Staging Area Construction and Maintenance
- Maintaining Covers on Soil Piles
- Lining and Tarping Transport Vehicles
- Prevention of Cross-contamination of Adjacent Areas by Restricting Excavation Area Access
- Proper use and Disposal of PPE
- Proper Decontamination of Personnel, Equipment and Tools

It is TN&A's intention to employ all of the above listed "engineering controls" to minimize the potential for any lead related hazards. It will be the responsibility of the SHSO and CS to ensure that all means and methods of limiting hazards, to site workers and the surrounding environment, are employed at the IR Site 08 – NUSC Disposal Area Site.

In addition, hygiene stations will be provided in order to allow on-site workers to clean hands and faces prior to scheduled breaks and at the end of work shifts.

17.3 Air Sampling and Monitoring

Initial real-time monitoring will be conducted through the use of the DATARAM or MINIRAM. The action limit for airborne respirable particulate set for this project is **3.0 mg/m³** and airborne inhalable particulate is **10.0 mg/m³** based on Appendix B of the 2004 ACGIH TLV® and BEI® booklet.

Appendix B addresses particles (insoluble or poorly soluble), Not Otherwise Specified [PNOS]. The ACGIH believes that even biologically inert, insoluble, or poorly soluble particles may have adverse effects and recommends that airborne concentrations should be kept below is **3.0 mg/m³**, and **10.0 mg/m³**, inhalable particles.

In the event real-time monitoring indicates that airborne particulate concentrations are at **3.0 mg/m³** or greater for respirable particles or **10.0 mg/m³** for inhalable particles then an upgrade in PPE will be required and an occupational exposure monitoring program for airborne lead will be implemented.

The occupational exposure monitoring program for airborne lead will consist of conducting personal sampling of workers conducting representative work activities during excavation activities. Sampling of airborne lead concentrations within the breathing zones of employees will be conducted to determine the 8-hour time weighted average (TWA) concentration in accordance with 29 CFR 1926.62. The 8-hr. TWA concentration will be compared to the Action Level (AL) for lead of 30 micrograms/cubic meter of air (ug/m³) and the Permissible Exposure Limit (PEL) for Lead of 50 ug/m³. Soil samples had indicated the highest levels of lead detected in the soil was 830 mg/kg (milligrams per kilogram), in addition the soils contained 340 mg/kg of manganese and 0.34 mg/kg of mercury. Using this information and the action level for lead as 30 ug/m³, "Safety Now" modeling data indicated that the excavation activities would need to generate 10.92 mg/m³ of dust to reach the respective action limits of the chosen heavy metals. Since this level is very high, the conservative ACGIH level of **3.0 mg/m³** for respirable particles and **10.0 mg/m³** for inhalable particles was chosen as the action limit for this project.

Naval Facilities Engineering Command - Northeast
IR Site 08 – NUSC Disposal Area Soil Removal Action, Naval Undersea Warfare Center, Middletown, RI
Health and Safety Plan Revision 2

Real-time air monitoring will be conducted with a MiniRAM or a DATARAM to determine the total dust in the air. The instrument will be set up in the excavator or near the excavation.

18.0 HAZARDOUS ENERGY CONTROL PLAN

18.1 Electrical and Utility Hazards

Electrical hazards exist from the use of electrical equipment at the Site. All electrical equipment will be visually inspected for external defects to the equipment, including the cord. Should there be any evidence of damage, the equipment is not to be used.

All electrical equipment must use a GFCI system. Electrical equipment must be stored in a dry area and must not be used outside in the rain.

These guidelines are “performance based” in that each organization should devise and implement its own program in order to meet its own needs and address each of the requirements contained herein. These guidelines contain the most current information available. The OSHA standard, “Control of Hazardous Energy,” (more commonly referred to as Lockout/Tagout) is found in 29 CFR 1910.147.

Lockout/tagout is intended to specifically cover the servicing and maintenance of machines and equipment in which the unexpected energizing, startup, or release of stored energy could cause injury to employees. It establishes requirements for the lockout/tagout of energy isolating devices whenever maintenance or servicing is done.

An energy source can include electrical, mechanical, hydraulic, pneumatic, chemical, or thermal. An “energy-isolating device” is a mechanical device that physically prevents the transmission or release of energy. There are many kinds, but the control circuit types of devices (such as push buttons and selector switches) are not energy isolating devices. An energy-isolating device must positively stop the transmission or release of energy. An energy-isolating device is capable of being locked out when it has a lock built into it, or it can be physically locked (the lock itself can use a key or combination).

Put another way, lockout/tagout ensures that the machine or equipment is stopped, isolated from all potentially hazardous energy sources, and locked out before employees perform any servicing or maintenance where the unexpected start-up or release of stored energy could cause injury.

18.1.1 Lockout/Tagout Exceptions

There are four exceptions to when lockout/tagout devices do not have to be used:

1. If you can unplug the cord for the machine or equipment, and doing so eliminates the only possible hazard, then you do not need to use lockout/tagout. The plug must be under the exclusive control of the employee performing the work.
2. Normal production operations such as minor tool changes, adjustments, and minor servicing are not covered – with the following conditions:
 - If they are routine, repetitive, and integral to the use of the machine for production.
 - And, the work is performed using alternative measures (to lockout/tagout), which provide effective protection.
 - But, if an employee must remove or bypass guards or other safety devices, or place his/her body in the “point of operation,” then lockout/tagout must be followed.

3. If a machine or equipment meets all eight of these elements:
 - The machine or equipment has no potential for stored energy (residual or re-accumulated) after shutdown that could cause injury to employees.
 - It has a single energy source that can be readily identified and isolated.
 - Isolating and locking out that energy source will completely de-energize and deactivate it.
 - It is isolated from that energy source and locked out.
 - A single lockout device will achieve a locked out condition.
 - The lockout device is under the exclusive control of the authorized employee performing the work.
 - The work does not create a hazard for other employees.
 - In using this exception, there have been no accidents involving unexpected activation or re-energizing.
4. Hot tap operations on pressurized pipelines (gas, steam, water, petroleum, etc.) if:
 - Continuity of service is essential.
 - Shutdown of the system is impractical.
 - Documented procedures are followed and special equipment is used that will provide proven effective protection for employees.

18.1.2 Energy Control Program

The Energy Control program consists of three basic areas. There need not be an overall written program, but these three basic areas each have written requirements:

There must be written procedures for lockout/tagout of each machine or piece of equipment. Similar machines may be grouped. Specific exceptions are listed in the Corporate Safety and Health Manual; there must be written, periodic inspection records; and there must be written training records.

If the energy-isolating device can physically be locked out, it should be. Tags should be used only if it cannot be locked out. There are strict conditions for using a tagout. Whenever new machinery or equipment is installed, a requirement is that the energy-isolating device must be designed to accept a lockout device.

For the purposes of lockout/tagout, these definitions will apply:

- An “authorized employee” is one who is required to perform the lockout/tagout in accordance with this procedure and actually does the servicing or repair;
- An “affected employee” is one who is not doing the locking out but one who is required to work at the machine or be in the area; and
- “Other employees” are those who may be in an area where lockout/tagout is used.

18.1.3 Lockout/Tagout Procedure

There must be a written procedure for each machine or piece of equipment that requires servicing or maintenance. Similar machines and equipment (such as those using the same type and magnitude of energy and have the same or similar types of controls) can be covered with a

single written procedure. Air valves, when used, as energy isolating devices, must be lockable and self-bleeding. If it is not obvious what they operate, they must be labeled. If they are not self-bleeding, the bleed-off valve must be locked open.

The written procedure should contain a specific statement of the intended use of the procedure, the name of the machine or equipment the procedure is intended for (similar machines may be grouped), and the location, department, etc., of the machine or equipment. It should also contain a chart or similar arrangement showing each type and magnitude of energy utilized and each energy isolating device required, the location on the machine or equipment of each energy isolating device, and the method to be used, either lockout or tagout, on the energy isolating device. The authorized employee will need to have a lockout/tagout device for each energy-isolating device. Note: Each and every energy source that could cause the unexpected energizing, start-up, or release of stored energy must have an energy-isolating device.

Next, each of the following points should be covered in the written procedure for the sequence of lockout/tagout:

The authorized employee should notify all affected employees that service or maintenance is required and that the machine or equipment will be shut down and locked out/tagged out. If the machine or equipment is operating, shut it down by the normal stopping procedure. Use the list of energy isolating devices to isolate the machine or equipment from all energy sources. Lockout/tagout the energy isolating devices to the safe or off position.

Stored or residual energy must be dissipated, restrained, relieved, disconnected, and rendered safe by methods such as grounding, repositioning, or blocking, bleeding down, etc. Stored or residual energy can be in such forms as capacitors, springs, elevated machine members, rotating flywheel, hydraulic systems, and air, gas, steam, or waste pressure. If stored energy can re-accumulate to a hazardous level, it must continuously be verified that it has not done so.

Test to make certain the equipment will not operate. First, check that no personnel are exposed. Operate the controls to make certain the equipment will not operate. Return the controls to the off/neutral position after the test.

Finally, the following points should be covered in the written procedure for the return of the machine or equipment to operation or service:

Check the area around the machine to ensure nonessential items have been removed and machine components are operationally intact, guards replaced, etc.;

- Check the area to make sure all employees are safely removed;
- Verify that the controls are in off or neutral; and
- Notify affected employees that service or maintenance is complete, and the machine or equipment is ready for use.

If the lockout/tagout must be removed during the maintenance for servicing, testing, or positioning of the equipment, then a section of the procedure must discuss how to do this (refer to the Corporate Safety and Health Manual). If group lockout/tagout is required, then a section of the procedure must discuss how to do this.

18.1.4 Periodic Inspection

Each lockout/tagout procedure for a particular machine (or group of machines) must be reviewed at least annually to correct any inadequacies and make sure it is being followed. After review (with or without corrections) annual training must take place. This must be done by an authorized employee who does not use that particular procedure.

A procedure that uses only lockout must be reviewed with all authorized employees. A procedure that uses tagout in any part of it must be reviewed with all authorized and affected employees. The inspection must provide for and ensure effective correction of identified deficiencies. There must be a written inspection certification sheet, which lists:

- The name of the procedure for the machine/equipment, and the location/department being inspected;
- Date of the inspection;
- Employees included in the inspection;
- Inspector's name;
- The deficiencies found in the procedure; and
- The corrective action taken (procedure rewritten) and date completed; retraining must take place now.

18.1.5 Training and Communication

Authorized employees must be trained in the recognition of hazardous energy sources, the type and magnitude of energy available in the workplace, and the methods and means of energy isolation and control. Affected employees must be trained in the purpose and use of energy control procedures. Other employees must be instructed as to the procedures and the prohibition against tampering with lockout/tagout devices. If it is locked out or tagged out, they should not attempt to start, energize, or use the machine or equipment.

There must be a written record (certification) of training or retraining to include the employee's name and date of training. Retraining is necessary annually during the certification and whenever these changes occur:

- Employee job change;
- New hazard because of change in machine or equipment;
- Change in energy control procedure; and/or
- Periodic inspection reveals inadequacies.

When the energy-isolating device is not lockable, tagout may be used. It is preferable to lock out the energy-isolating device. If tagout is used, there must be additional training and more rigorous periodic inspections. When tagout systems are used, employees shall also be trained in the following limitations of tags:

Tags are essentially warning devices affixed to energy isolating devices and do not provide the physical restraint on those devices that is provided by a lock. When a tag is attached to an energy isolating means, it is not to be removed without authorization of the designated person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

To be effective, tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area. Tags and their means of attachment must be made of materials that will withstand the environmental conditions encountered in the workplace. Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program. Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected.

18.1.6 Material and Hardware

All protective material (locks, chains, tags, wedges, key blocks, etc.) shall be provided by TN&A. The locks and tags must have the individual name of the employee on them and be for their exclusive use. These devices can only be used for lockout/tagout procedures and not for any other purpose.

The locks must be durable and able to withstand their environment for their maximum time of exposure. The locks must be substantial so that they cannot be removed without special tools or force. The identification tags must be attached with the equivalent of a single use (50 lb.) self-locking nylon cable tie. They must warn, in writing, of the hazardous condition and must clearly indicate that movement from safe or off position is prohibited. The lockouts and tagouts must be standardized for each specific field site.

18.1.7 Employee Unavailable to Remove Lockout/Tagout

If the employee who placed the lockout/tagout device is not present to remove it, TN&A may remove it by verifying the employee is not present, removing the lockout/tagout after assuring it is safe to do so, and making a reasonable effort to contact the employee and tell him the device is removed. The sequence for temporarily removing lockout/tagout for test or positioning is as follows:

- Clear the machine or equipment;
- Remove employees from the area;
- Remove lockout/tagout devices;
- Energize and proceed with testing or positioning; and
- De-energize and reapply lockout/tagout devices.

18.1.8 Outside Contractors

Lockout/tagout procedures must be coordinated between the General Contractor and site personnel to ensure protection.

18.1.9 Group Lockout/Tagout

The group lockout must have the same level of protection as a personal lockout/tagout device. One person can be in charge of the group procedure, but each individual employee must attach

Naval Facilities Engineering Command - Northeast
IR Site 08 – NUSC Disposal Area Soil Removal Action, Naval Undersea Warfare Center, Middletown, RI
Health and Safety Plan Revision 2

his or her own personal lockout/tagout device by means of a group device. Special care must be taken during shift changes to ensure continuity of coverage of lockout/tagout protection.

19.0 SEVERE WEATHER PLAN

Inclement weather can cause injury to personnel and property damage. The timing of the IR Site 08 – NUSC Disposal Area Soil Removal Action Project has the potential to expose the site workers to a myriad of weather conditions. The “work” is scheduled to begin in late February 2005 and run through early spring. Therefore the site will be subjected to sub-freezing temperatures, possibility of snowfall, above freezing daytime temperatures with snow/ice/frost melt with overnight re-freeze and associated hazards. Different weather events present different hazards to site workers. Sub-freezing temperatures bring not only hazards such as hypothermia and frostbite, but also severe slip, trip and fall hazards associated with ice and/or snow on ground surfaces. The typical freeze/thaw cycle poses another hazard at a construction/excavation site with the present of unstable ground surfaces and muddy conditions, which also promote slip, trip and fall hazards for ground personnel. Spring rains and snowmelt also promote slip, trip and fall hazards associated with unstable ground conditions, mud and running storm waters. Muddy conditions make it hazardous to enter/exit construction equipment and measures must be taken to limit the buildup of mud on equipment.

The SHSO and CS will monitor the local weather through available media such as TV, Internet access and radio. Protective actions during inclement weather are addressed in the AHA.

20.0 ALCOHOL AND DRUG ABUSE PLAN

It is TN&A's desire to provide a drug-free, healthful, and safe workplace. To promote this goal, employees are expected to report to work in appropriate mental and physical condition to perform their jobs in a satisfactory manner.

While on TN&A premises and while conducting business-related activities off TN&A premises, no employee may use, possess, distribute, sell, or be under the influence of alcohol or illegal drugs. The legal use of prescribed drugs is permitted on the job only if it does not impair an employee's ability to perform the essential functions of the job effectively and in a safe manner that does not endanger themselves or other individuals in the workplace. When indications of use or impairment are present, employees may be requested to undergo blood, breath, urine or other drug or alcohol testing. Failure to agree to undergo testing may result in termination of employment.

Employees with questions or concerns about substance dependency or abuse are encouraged to discuss these matters with the Human Resources Department to receive assistance or referrals to appropriate resources in the community.

As a federal contractor, TN&A is required to abide by the Drug-Free Workplace Act of 1988. The Act requires TN&A to prepare and distribute an anti-drug policy statement prohibiting any drug-related activity in the workplace. Certain TN&A federal contracts may require pre, post, and interim alcohol and drug testing. Employees will be required to comply with the testing program while employed on these projects or be subject to disciplinary action.

The Act mandates that employees must, as a condition of employment, abide by the terms of this policy and report any conviction under a criminal drug statute for violations occurring on or off company premises while conducting company business. The report is to be made within five (5) days of the conviction to a member of TN&A's management.

Pursuant to the Drug-Free Workplace Act of 1988, the employer must notify the contracting federal agency of any such conviction within ten (10) days of being notified by the employee.

Violations of this policy may lead to disciplinary action, up to and including immediate termination of employment, and/or required participation in a substance abuse rehabilitation or treatment program. Such violations may also have legal consequences.

Employees with questions on this policy or issues related to drug or alcohol use in the workplace should raise their concerns with the Human Resources Department without fear of reprisal.

21.0 REFERENCES

- Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, Pocket Guide to Chemical Hazards and Other Databases, DHHS (NIOSH) Publication No. 2002-145, February 2004.
- ACGIH (American Conference of Governmental Industrial Hygienists). 2004. Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio.
- Hazardous Waste Site Operations and Emergency Response Standard (OSHA 29 CFR 1910.120 and 1926.65).
- OSHA (Occupational Safety and Health Administration). 29 Code of Federal Regulations (CFR) 1926 Construction Safety Regulations.
- USACE (U.S. Army Corps of Engineers). 1996. Safety and Health Requirements Manual, EM-385-1-1, November 2003.
- Safety Now – Controlling Chemical Exposures at hazardous Waste Sites with Real Time Measurements, Christopher Marlowe, CIH, AIHA Press, 1999
- NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS (NIOSH) Publication No. 85-115.
- EPA Standard Operating Safety Guides, Publication 9285.1-03.

TABLE

Contractor Activity Hazard Analysis

Activity Hazard Analysis

Activity: Task 1 (AHA 1)

Mobilization and General Surveying

Analyzed by/Date: Ronald Bugg/ May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Mobilization – (AHA1) Mobilization 1. Site Preparation including clearing and grubbing 2. Establishment of temporary support facilities including a small office trailer and portable sanitation units 3. Utility Location, Identification and Dig Permit General Survey - 4. Conduct General walkthrough of site 5. Designate areas of concern	Noise (heavy equipment and power tools) Damage to hearing, Miscommunication	Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing.
	Heat Stress (heat cramps, heat exhaustion, heat stroke)	Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.
	Improper PPE (Head, eye and foot injuries) See requirements for Level D or Modified Level D.	Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE, request for leg protection for fragment when cutting shrubs or trees when using power tools (saw and weed wacker) See Section 7.0 for additional information.
Mobilization (2 & 3) General Survey (4 & 5)	Misuse of hand and power tools	There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.
	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.
Mobilization (2 & 3) General Survey (4 & 5)	Electrocutation/ Electric shock	Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.
All Subtasks Mobilization (1-3) and General Survey (4 & 5)	Slip/Trip and fall	Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
All Subtasks Mobilization (1-3) and General Survey (4 & 5)	Biological Hazards	Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.
All Subtasks Mobilization (1-3) and General Survey (4 & 5)	Chemical Exposure: Inhalation; Ingestion; Skin Absorption	ENSURE field crew has gone through HAZARD COMMUNICATION TRAINING Wear appropriate PPE – coveralls, gloves, boots, respiratory protection (if necessary), eye protection as described in the SSHP. Monitor Exposure in accordance with protocol described in the SSHP.
Equipment Used	Inspection Requirement	Training Requirement
Heavy Equipment Trucks PPE – Modified Level D Air Monitoring Equipment Hand Tools/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use	40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)

Activity Hazard Analysis

Activity: Task 2 (AHA 2)

Demarcation of the two excavation areas (buried drum and metal container areas)

Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Demarcation of the two excavation areas (buried drum and metal container areas)	Noise (heavy equipment and power tools) Damage to hearing, Miscommunication	Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.
	Heat Stress (heat cramps, heat exhaustion, heat stroke)	Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.
	Improper PPE (Head, eye and foot injuries) See requirements for Level D or Modified Level D.	Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE, request for leg protection for fragment when cutting shrubs or trees when using power tools (saw and weed wacker) See Section 7.0 for additional information.
Marking utilities conducted by subcontractors or provided by utilities.	Misuse of hand and power tools	There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.
Arrangement of equipment and preparation for the excavation and determine what is required if the utilities are within the area of excavation.	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.
	Electrocution/ Electric shock	Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.
All surveyors and preplanning activities for the excavation.	Slip/Trip and fall	Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
All Subtasks	Biological Hazards	Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.
All Subtasks	Chemical Exposure: Inhalation; Ingestion; Skin Absorption	ENSURE field crew has gone through HAZARD COMMUNICATION TRAINING Wear appropriate PPE – coveralls, gloves, boots, respiratory protection (if necessary), eye protection as described in the SSHP. Monitor Exposure in accordance with protocol described in the SSHP.
Equipment Used	Inspection Requirement	Training Requirement
Heavy Equipment Trucks PPE – Modified Level D Air Monitoring Equipment Hand Tools/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use	40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)

Activity Hazard Analysis

Activity: Task 3 (AHA 3)

Installation of Soil Erosion Control Measures Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Installation of Soil Erosion Control Measures (buried drum and metal container areas)	Noise (heavy equipment and power tools) Damage to hearing, Miscommunication	Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.
	Heat Stress (heat cramps, heat exhaustion, heat stroke)	Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.
	Improper PPE (Head, eye and foot injuries) See requirements for Level D or Modified Level D.	Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE, request for leg protection for fragment when cutting shrubs or trees when using power tools (saw and weed wacker) See Section 7.0 for additional information.
Prepare installation of erosion control measures near the marked excavaton	Misuse of hand and power tools	There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.
Arrangement of equipment in preparation for the placement of erosion control material.	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.
	Electrocution/ Electric shock	Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.
All surveyors and preplanning activities for the excavation.	Slip/Trip and fall	Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
All Subtasks	Biological Hazards	Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.
All Subtasks	Chemical Exposure: Inhalation; Ingestion; Skin Absorption	ENSURE field crew has gone through HAZARD COMMUNICATION TRAINING Wear appropriate PPE – coveralls, gloves, boots, respiratory protection (if necessary), eye protection as described in the SSHP. Monitor Exposure in accordance with protocol described in the SSHP.
Equipment Used	Inspection Requirement	Training Requirement
Heavy Equipment Trucks PPE – Modified Level D Air Monitoring Equipment Hand Tools/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use	40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)

Activity Hazard Analysis

Activity: Task 4 (AHA 4)

Installation/Construction of soil, drum and debris staging areas

Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Installation/Construction of soil, drum and debris staging area (buried drum and metal container areas)	Noise (heavy equipment and power tools) Damage to hearing, Miscommunication	Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.
	Heat Stress (heat cramps, heat exhaustion, heat stroke)	Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.
	Improper PPE (Head, eye and foot injuries) See requirements for Level D or Modified Level D.	Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE, request for leg protection for fragment when cutting shrubs or trees when using power tools (saw and weed wacker) See Section 7.0 for additional information.
Prepare installation staging areas	Misuse of hand and power tools	There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.
Use of equipment in preparation for the placement of staging areas for drums, containers, and soil.	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.
	Electrocution/ Electric shock	Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.
Laying down of visqueen, barricades, and preparing the staging area.	Slip/Trip and fall	Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
All Subtasks	Biological Hazards	Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.
All Subtasks (depending on the location of the staging area). All staging areas will be near the EZ /CRZ areas/	Chemical Exposure: Inhalation; Ingestion; Skin Absorption	ENSURE field crew has gone through HAZARD COMMUNICATION TRAINING Wear appropriate PPE – coveralls, gloves, boots, respiratory protection (if necessary), eye protection as described in the SSHP. Monitor Exposure in accordance with protocol described in the SSHP.
Equipment Used	Inspection Requirement	Training Requirement
Heavy Equipment Trucks PPE – Modified Level D Air Monitoring Equipment Hand Tools/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use	40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)

Activity Hazard Analysis

Activity: Task 5 (AHA 5)

Excavation of the buried drum area to the dimensions required (15' from center of TP02 - 96 CY estimated)

Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
<p>Excavation of the buried drum area to the dimensions required (15' from center of TP02 - 96 CY estimated)</p> <ul style="list-style-type: none"> • Uncovering, removal and overpacking of any drums encountered (2 previously identified drums, 8 additional drums estimated). • Removal and staging (in the soil, drum and debris staging area) of soils deemed "contaminated" via "field screening" (8 tons ~ 5.6 CY - estimated). • Removal and staging (adjacent to the excavation) of soils not deemed "contaminated" via "field screening" (air monitoring) (90.4 CY - estimated). 	<p>Noise (heavy equipment and power tools) Damage to hearing, Miscommunication</p>	<p>Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.</p>
	<p>Heat Stress (heat cramps, heat exhaustion, heat stroke).</p> <p>Depending on the levels of protection, an increase in the levels of protection cause an increase of heat stress due to the suits (enclosed area) and the weight of the PPE involved. More work is needed when using Level C.</p>	<p>Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.</p>
	<p>Improper PPE (Head, eye and foot injuries) See requirements for Level B when dealing with material from an unknown drum to Modified Level D (when excavating an area). Exposure to unknown organic or caustic compounds may be results of improper exposure.</p> <p>Pinch-points need to be discussed and understood to reduce the possible fingers or other parts of the body being trapped between to points</p>	<p><u>Excavation/Overpacking/Staging:</u> Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE, <u>Excavation:</u> request for leg protection for fragment when cutting shrubs or trees when using power tools (saw and weed wacker) See Section 7.0 for additional information. When excavation, <u>Overpacking</u> Levels of protection will be based on exposure levels using air monitoring equipment for organics and site conditions. When dealing with unknown drums prior to overpacking, levels of protection will be based on the condition of the drums, the levels of organic vapors detected with the PID/FID instrument near the drum. See action levels to determine the levels of protection. Minimum of level see for any unknown leaking drum, Level B if organic or caustic material is determined to be on site on near the drum area. <u>Staging</u> Handling of overpacked drums may require level D to Level C depending on the outside conditions (air monitoring results) near the drums of concern.</p>
<p>Preparing for excavation and assisting on excavation Overpacking – proper tools to overpack drum Staging Drums</p>	<p>Misuse of hand and power tools</p>	<p>There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.</p>

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
<p>Use of equipment Excavation</p> <p>Overpacking: lifting of excavated drums and placing the drum in an overpacking the drums</p> <p>Staging the overpacked drums: moving the drums to the staging area.</p> <p>Straps and chains are in perfect working conditions</p>	<p>Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death</p> <p>Overhead material being moved to staging areas</p> <p>Be aware of loose straps and chains.</p>	<p>Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.</p>
	<p>Electrocution/ Electric shock</p>	<p>Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.</p>
<p>Working near excavation, leaking drums (overpack) and Staging the overpacked drums (visqueen, barricades)</p>	<p>Slip/Trip and fall</p>	<p>Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.</p>
<p>All Subtasks</p>	<p>Biological Hazards</p>	<p>Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.</p>
<p>All Subtasks (depending on the location of the staging area). <u>During excavation</u> be prepared to conduct air monitoring Overpacking of unknown drums (handling and overpacking) Handing drums at the staging area</p>	<p>Chemical Exposure: Inhalation; Ingestion; Skin Absorption</p>	<p>ENSURE field crew has gone through HAZARD COMMUNICATION TRAINING Wear appropriate PPE – coveralls, gloves, boots, respiratory protection (if necessary), eye protection as described in the SSHP. Monitor Exposure in accordance with protocol described in the SSHP.</p>
Equipment Used	Inspection Requirement	Training Requirement
<p>Heavy Equipment Trucks PPE – Modified Level B to D Air Monitoring Equipment Hand Tools/Power Tools SCBA if necessary Straps or chains to move drums</p>	<p>Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use</p>	<p>40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)</p>

Activity Hazard Analysis

Activity: Task 6 (AHA 6)

Excavation of the buried drum area to the dimensions required 200 CY ~ 284 tons – estimated)

Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
<ul style="list-style-type: none"> ● Excavation of the buried drum area to the dimensions required (200 CY ~ 284 tons – estimated) ● Uncovering, removal and overpacking of any drums encountered (2 previously identified drums, 8 additional drums estimated). ● Removal and staging (in the soil, drum and debris staging area) of soils deemed “contaminated” via “field screening” ● Removal and staging (adjacent to the excavation) of soils not deemed “contaminated” via “field screening” (air monitoring) (over 200 CY - estimated). 	<p>Noise (heavy equipment and power tools) Damage to hearing, Miscommunication</p>	<p>Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.</p>
	<p>Heat Stress (heat cramps, heat exhaustion, heat stroke).</p> <p>Depending on the levels of protection, an increase in the levels of protection cause an increase of heat stress due to the suits (enclosed area) and the weight of the PPE involved. More work is needed when using Level C.</p>	<p>Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.</p>
	<p>Improper PPE (Head, eye and foot injuries) See requirements for Level B when dealing with material from an unknown drum to Modified Level D (when excavating an area). Exposure to unknown organic or caustic compounds may be results of improper exposure.</p> <p>Pinch-points need to be discussed and understood to reduce the possible fingers or other parts of the body being trapped between to points</p>	<p><u>Excavation/Overpacking/Staging:</u> Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE, <u>Excavation:</u> request for leg protection for fragment when cutting shrubs or trees when using power tools (saw and weed wacker) See Section 7.0 for additional information. When excavation, <u>Overpacking</u> Levels of protection will be based on exposure levels using air monitoring equipment for organics and site conditions. When dealing with unknown drums prior to overpacking, levels of protection will be based on the condition of the drums, the levels of organic vapors detected with the PID/FID instrument near the drum. See action levels to determine the levels of protection. Minimum of level see for any unknown leaking drum, Level B if organic or caustic material is determined to be on site on near the drum area. <u>Staging</u> Handling of overpacked drums may require level D to Level C depending on the outside conditions (air monitoring results) near the drums of concern.</p>
<p>Preparing for excavation and assisting on excavation Overpacking – proper tools to overpack drum Staging Drums</p>	<p>Misuse of hand and power tools</p>	<p>There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.</p>

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
<p>Use of equipment Excavation</p> <p>Overpacking: lifting of excavated drums and placing the drum in an overpacking the drums</p> <p>Staging the overpacked drums: moving the drums to the staging area.</p> <p>Straps and chains are in perfect working conditions</p>	<p>Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death</p> <p>Overhead material being moved to staging areas</p> <p>Be aware of loose straps and chains.</p>	<p>Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.</p>
	<p>Electrocution/ Electric shock</p>	<p>Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.</p>
<p>Working near excavation, leaking drums (overpack) and Staging the overpacked drums (visqueen, barricades)</p>	<p>Slip/Trip and fall</p>	<p>Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.</p>
<p>All Subtasks</p>	<p>Biological Hazards</p>	<p>Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.</p>
<p>Using Excavator to remove debris and to excavate area for removing unknown drums, overpacking unknown drums, and staging overpacked drums/</p>	<p>Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death</p>	<p>Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator. Be aware of proper trenching tech</p>
<p>All Subtasks (depending on the location of the staging area). <u>During excavation</u> be prepared to conduct air monitoring Overpacking of unknown drums (handling and overpacking) Handing drums at the staging area</p>	<p>Chemical Exposure: Inhalation; Ingestion; Skin Absorption</p>	<p>ENSURE field crew has gone through HAZARD COMMUNICATION TRAINING Wear appropriate PPE – coveralls, gloves, boots, respiratory protection (if necessary), eye protection as described in the SSHP. Monitor Exposure in accordance with protocol described in the SSHP.</p>

Equipment Used	Inspection Requirement	Training Requirement
Heavy Equipment Trucks, ecavator PPE – Modified Level B to D Air Monitoring Equipment Hand Tools/Power Tools SCBA if necessary Straps or chains to move drums	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use	40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)

Activity Hazard Analysis

Activity: Task 7 (AHA 7)

Sampling and Analyses

Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
<p>Sampling and Analyses</p> <ul style="list-style-type: none"> Removed and overpacked drums to be sampled for RCRA Characteristics, Full TCLP, PCBs, Total Petroleum Hydrocarbons and any other analyses required in support of offsite disposal. Staged "contaminated" soils and debris stockpiles (<50 CY) to be sampled via collection of a 4-point composite sample. Samples to be analyzed for Full TCLP, PCBs, Total Petroleum Hydrocarbons and any other analyses required for offsite disposal. Proposed fill and topsoil materials to be sampled and analyzed for the same above components in order to "certify" that the proposed materials are "clean" as compared to the RIDEM Direct Exposure Criteria for residential use soils. 1 sample per source required. 	<p>Noise (heavy equipment and power tools) Damage to hearing, Miscommunication</p>	<p>Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.</p>
	<p>Heat Stress (heat cramps, heat exhaustion, heat stroke).</p> <p>Depending on the levels of protection, an increase in the levels of protection cause an increase of heat stress due to the suits (enclosed area) and the weight of the PPE involved. More work is needed when using Level C.</p>	<p>Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.</p>
	<p>Improper PPE (Head, eye and foot injuries) See requirements for Level B when dealing with material from an unknown drum to Modified Level D (when excavating an area). Exposure to unknown organic or caustic compounds may be results of improper exposure.</p> <p>Pinch-points need to be discussed and understood to reduce the possible fingers or other parts of the body being trapped between to points</p>	<p><u>Sampling :</u> Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE, <u>Sampling drums:</u> Depending on the condition and air monitoring, sampling drums of material may be level C to Level B. Proper protection would be tyvek/saranex suits, APR or SCBA depending on the air monitoring reading <u>Sampling staged contaminated soil</u> Levels of protection will be based on exposure levels using air monitoring equipment for organics and site conditions. When dealing with unknown material, levels of protection will be based on the condition of the soil with PID/FID instrument readings near the soil. See action levels to determine the levels of protection. Minimum of level if at background would be level D and greater if elevated levels or organics were detected in the soil. <u>Sampling cleanfill</u> Handling cleanfill would be level D.</p>
<p>Preparing for excavation and assisting on excavation Overpacking – proper tools to overpack drum Staging Drums</p>	<p>Misuse of hand and power tools</p>	<p>There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.</p>

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
<p>Use of equipment Excavation</p> <p>Drum sampling: moving of drums</p> <p>Moving soil for sampling.</p> <p>Straps and chains are in perfect working conditions</p>	<p>Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death</p> <p>Overhead material being moved to staging areas</p> <p>Be aware of loose straps and chains.</p>	<p>Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.</p>
	<p>Electrocution/ Electric shock</p>	<p>Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.</p>
<p>Working near excavation, leaking drums (overpack) and Staging the overpacked drums (visqueen, barricades)</p>	<p>Slip/Trip and fall</p>	<p>Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.</p>
<p>All Subtasks</p>	<p>Biological Hazards</p>	<p>Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.</p>
<p>Using Excavator to remove debris and to excavate area for removing unknown drums, overpacking unknown drums, and staging overpacked drums/</p>	<p>Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death</p>	<p>Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator. Be aware of proper trenching tech</p>
<p>All Subtasks (depending on the location of the staging area). Near Drums be prepared to conduct air monitoring of overpack of unknown drums (handling and overpacking) Handing drums at the staging area.</p> <p>Soil contaminated</p>	<p>Chemical Exposure: Inhalation; Ingestion; Skin Absorption</p>	<p>ENSURE field crew has gone through HAZARD COMMUNICATION TRAINING Wear appropriate PPE – coveralls, gloves, boots, respiratory protection (if necessary), eye protection as described in the SSHP. Monitor Exposure in accordance with protocol described in the SSHP.</p>
Equipment Used	Inspection Requirement	Training Requirement
<p>Heavy Equipment Trucks, excavator PPE – Modified Level B to D Air Monitoring Equipment Hand Tools/Power Tools SCBA if necessary Straps or chains to move drums</p>	<p>Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use</p>	<p>40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)</p>

Activity Hazard Analysis

Activity: Task 8 (AHA 8)

Load-out of Drums, soils and debris

Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
<p>Load-out of Drums, soils and debris (transportation and disposal)</p> <ul style="list-style-type: none"> • Removed drums from the staging area and place them in the proper carrier for to transport the drums for disposal • Load the Staged “contaminated” soils and debris stockpiles for transporting material for disposal. 	<p>Noise (heavy equipment and power tools) Damage to hearing, Miscommunication</p>	<p>Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.</p>
	<p>Heat Stress (heat cramps, heat exhaustion, heat stroke).</p> <p>Depending on the levels of protection, an increase in the levels of protection cause an increase of heat stress due to the suits (enclosed area) and the weight of the PPE involved. More stress is needed when using Level C.</p>	<p>Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.</p>
	<p>Improper PPE (Head, eye and foot injuries) See requirements for Level B when dealing with material from an unknown drum to Modified Level D (when excavating an area). Exposure to unknown organic or caustic compounds may be results of improper exposure.</p> <p>Pinch-points need to be discussed and understood to reduce the possible fingers or other parts of the body being trapped between to points</p>	<p><u>Drum and Soil Disposal :</u> Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE, <u>Drum Loading for disposal:</u> Depending on the condition and air monitoring, sampling drums of material may be level C to Level B. Proper protection would be tyvek/saranex suits, APR or SCBA depending on the air monitoring reading <u>Loading staged contaminated soil</u> Levels of protection will be based on exposure levels using air monitoring equipment for organics and site conditions. When dealing with unknown material, levels of protection will be based on the condition of the soil with PID/FID instrument readings near the soil. See action levels to determine the levels of protection. Minimum of level if at background would be level D and greater if elevated levels or organics were detected in the soil.</p>
<p>Preparing for excavation and assisting on excavation</p>	<p>Misuse of hand and power tools</p>	<p>There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.</p>

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
<p>Use of equipment Excavation</p> <p>Moving soil</p>	<p>Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death</p> <p>Overhead material due to moving and compressing backfill</p> <p>Be aware of loose straps and chains.</p>	<p>Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.</p>
	<p>Electrocution/ Electric shock</p>	<p>Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.</p>
<p>Working loading drums and preparing roll-off box for contaminated soil (line rolloff box)</p>	<p>Slip/Trip and fall</p>	<p>Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.</p>
<p>All Subtasks</p>	<p>Biological Hazards</p>	<p>Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.</p>
<p>Using Excavator/front-end loader to remove soil and debris from the staging area.</p> <p>Placing overpacked drums inside the truck</p>	<p>Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death</p>	<p>Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator. Be aware of proper trenching tech</p>
Equipment Used	Inspection Requirement	Training Requirement
<p>Heavy Equipment Trucks, excavator/frontend loader PPE – Modified Level C to D Air Monitoring Equipment Hand Tools/Power Tools Straps or chains to move drums</p>	<p>Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use</p>	<p>40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)</p>

Activity Hazard Analysis

Activity: Task 9 (AHA 9)

Grading, Backfill, and Compaction

Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Grading, Backfill, and Compaction <ul style="list-style-type: none"> • Backfill of excavations with excavated soils staged adjacent to the excavation. • Backfill of the remainder of the excavations with imported “certified clean” fill. • Backfill materials compacted to 90% of the maximum dry density. 	Noise (heavy equipment and power tools) Damage to hearing, Miscommunication	Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.
	Heat Stress (heat cramps, heat exhaustion, heat stroke).	Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.
	Improper PPE (Head, eye and foot injuries) See requirements for Level B when dealing with material from an unknown drum to Modified Level D Pinch-points need to be discussed and understood to reduce the possible fingers or other parts of the body being trapped between to points	<u>Grading, Backfill, and Compaction:</u> Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE,
Preparing for excavation and assisting on excavation	Misuse of hand and power tools	Grading, Backfill, and Compaction There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.
Use of equipment Excavation Moving soil	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death Excavation and placement of topsoil	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.
	Electrocutation/ Electric shock	Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Working loading drums and preparing roll-off box for contaminated soil (line rolloff box)	Slip/Trip and fall	Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.
All Subtasks	Biological Hazards	Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.
Using Excavator/front-end loader to remove soil and debris from the staging area. Placing overpacked drums inside the truck	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator. Be aware of proper trenching tech
All Subtasks (depending on the location of the staging area). <u>Near Drums</u> be prepared to conduct air monitoring of overpack of unknown drums (handling and overpacking) Handing drums at the staging area. Soil contaminated	Chemical Exposure: Inhalation; Ingestion; Skin Absorption	ENSURE field crew has gone through HAZARD COMMUNICATION TRAINING Wear appropriate PPE – coveralls, gloves, boots, respiratory protection (if necessary), eye protection as described in the SSHP. Monitor Exposure in accordance with protocol described in the SSHP.
Equipment Used	Inspection Requirement	Training Requirement
Heavy Equipment Trucks, excavator/frontend loader PPE – Modified Level C to D Air Monitoring Equipment Hand Tools/Power Tools Straps or chains to move drums	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use	40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)

Activity Hazard Analysis

Activity: Task 9 (AHA 9)

Topsoil Placement

Excavation areas covered with a 4-inch thick layer of topsoil

Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Topsoil Placement Excavation areas covered with a 4-inch thick layer of topsoil	Noise (heavy equipment and power tools) Damage to hearing, Miscommunication	Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.
	Heat Stress (heat cramps, heat exhaustion, heat stroke).	Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.
	Improper PPE (Head, eye and foot injuries) See requirements for Level B when dealing with material from an unknown drum to Modified Level D Pinch-points need to be discussed and understood to reduce the possible fingers or other parts of the body being trapped between to points	<u>Topsoil Placement:</u> Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE,
Preparing for excavation and assisting on excavation	Misuse of hand and power tools	Topsoil placement: There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.
Use of equipment Excavation Moving soil	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death Excavation and placement of topsoil	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.
	Electrocution/ Electric shock	Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Wet surfaces	Slip/Trip and fall	Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.
All Subtasks	Biological Hazards	Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.
Using Excavator/front-end loader to remove soil and debris from the staging area. Placing overpacked drums inside the truck	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator. Be aware of proper trenching tech
All Subtasks (depending on the location of the staging area). <u>Near Drums</u> be prepared to conduct air monitoring of overpack of unknown drums (handling and overpacking) Handing drums at the staging area. Soil contaminated	Chemical Exposure: Inhalation; Ingestion; Skin Absorption	ENSURE field crew has gone through HAZARD COMMUNICATION TRAINING Wear appropriate PPE – coveralls, gloves, boots, respiratory protection (if necessary), eye protection as described in the SSHP. Monitor Exposure in accordance with protocol described in the SSHP.
Equipment Used	Inspection Requirement	Training Requirement
Heavy Equipment Trucks, excavator/frontend loader PPE – Modified Level C to D Air Monitoring Equipment Hand Tools/Power Tools Straps or chains to move drums	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use	40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)

Activity Hazard Analysis

Activity: Task 10 (AHA 10)

Seeding, Fertilizing and Mulching

Analyzed by/Date: Ronald Bugg/May 20, 2005

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Seeding, Fertilizing and Mulching: <ul style="list-style-type: none"> • All disturbed areas to be restored with the specified "Park Mix" grass/turf seed. • All disturbed areas to be limed, mulched and fertilized as required. 	Noise (heavy equipment and power tools) Damage to hearing, Miscommunication	Implement hearing conservation program to comply with OSHA standards including exposure monitoring, employee training, engineering/ administrative controls, personal hearing protection, and audiometric testing. The marking of the utilities will be conducted by contractors or designated by blueprints of the site. The equipment maybe used during marking of lines.
	Heat Stress (heat cramps, heat exhaustion, heat stroke). Depending on the levels of protection, an increase in the levels of protection cause an increase of heat stress due to the suits (enclosed area) and the weight of the PPE involved.	Implement a heat stress control program when necessary due to environmental conditions. Use of PPE. Program to include monitoring, training, acclimatization, scheduling, work rest regimens, personal protective devices, shaded and cool rest areas, electrolyte and water replacement fluids, and biological monitoring when necessary. See Section 4.6.1 for additional information.
	Improper PPE (Head, eye and foot injuries) See requirements for Level B when dealing with material from an unknown drum to Modified Level D (when excavating an area). Exposure to unknown organic or caustic compounds may be results of improper exposure. Pinch-points need to be discussed and understood to reduce the possible fingers or other parts of the body being trapped between to points	<u>Fertilize and mulch:</u> Hard hats, steel-toe boots, and goggles/safety glasses are required on all sites and the proper protection for the specific equipment Hand tool, see manufacturer suggested PPE, wear proper gloves
Preparing fro fertilizing and placement of mulch	Misuse of hand and power tools	There are almost an infinite number of hand tools that can be used on site. Use proper tool for the job. Inspect prior to use. Store tools properly. Wear appropriate PPE such as safety glasses and gloves when handling hand and power tools. The tool requires them to be used by a competent/trained person.
Use of equipment Excavation Moving mulch	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death Overhead material	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator.
	Electrocutuion/ Electric shock	Use grounded or double-insulated tools. All electric tools must be connected to a ground fault circuit interrupter (GFCI) when in use. When working around subcontractor installing utilities, be aware of lockout/tagout procedure to reduce the potential of electrocution when working near the area. Be aware of electric tools and properly maintain them. If any equipment is inappropriately wired, the equipment will need to be tagged out and marked to not be used.

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Working near wet surfaces	Slip/Trip and fall	Safety training to stress the fundamentals, such as the cause and prevention of slip/trip/fall hazards, lifting techniques, and incident prevention. Barricades, construction signs, flashing warning devices, or guards will be placed as required and maintained during construction to protect people from injury and avoid damage to excavations.
All Subtasks	Biological Hazards	Biological hazards such as poison ivy, ticks, bees, etc., to be addressed during daily safety meeting. Proper PPE will include skin protection designed to keep biological hazard exposure to a minimum. Be aware of all domestic animals and other wildlife in the area. See Section 4.7 for additional information.
Using Excavator/front-end loader to move material	Heavy equipment operation in vicinity Struck-by Hazard: Injury; Death	Field personnel will alert all operators of their presence when in vicinity of equipment. Backup alarms, safe work practices for operator and field technicians. Establishment of traffic patterns. Level D PPE will be accompanied by personal reflective safety vests Eye contact and hand signals will be used to communicate with the equipment operator. Be aware of proper trenching tech
Equipment Used	Inspection Requirement	Training Requirement
Heavy Equipment Trucks, excavator/frontend loader PPE – Modified Level C to D Hand Tools/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use	40-hour OSHA HAZWOPER training (as required) 3-day supervised field training (as required) 8-hour OSHA HAZWOPER Supervisor training (as required) Site-Specific Safety training Equipment Training First Aid/CPR/AED training (as required)

APPENDIX A

Site Health and Safety Plan Compliance Agreement



**SITE HEALTH AND SAFETY PLAN
COMPLIANCE AGREEMENT**

I, _____(Print Name), was made available a copy of the Site Health and Safety Plan for the IR Site 08 – NUSC Disposal Area Soil Removal Action, Naval Undersea Warfare Center, Middletown, Rhode Island. I have read the plan, understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the safety requirements specified in the plan.

Signed:

Signature

Date

Signed for TN&A

Signature

Date

APPENDIX B

Training Certificates for Key Project Personnel



This is to certify that

Chris Miller

has successfully completed

*General Awareness & Function Specific
Training/USDOT HM126-F*

5/16/03

Date

4.00

Total Contact Hours

A handwritten signature in black ink, appearing to read "Ken Bogdan".

Ken Bogdan

Course Director

APR-30-2003 09:32

T N & ASSOCIATES INC.

414 257 2492 P.03/03


HEALTH RESOURCES

600 West Cummings Park, Suite 3400
 Woburn, Massachusetts 01801-6350
 Phone: (781) 935 - 8581; (800) 350 - 4511
 Fax: (781) 938 - 4678

Certificate For Respirator Use
29 CFR 1910.134

Employee's Name: Miller, Chris
 Social Security No: 177-62-8781
 Company: T.N. & Associates
 Company Branch: Milwaukee, WI
 Date Of Exam: 21 April 2003
 Exam Location: _____

I have examined the above named individual and I certify that this employee:

is physically capable is not physically capable

of using a negative pressure, air supplied respirator and/or powered air purifying respirator subject to the following restrictions:

- Respirator use should be limited to air supplied or powered air purifying respirators.
 (positive pressure)
- No respirator use if wheezing and shortness of breath are evident.

Comments:

Note: Prescription eyeglasses, contact lenses or beards cannot be worn with all types of respirators. Any interference with a face-to-face pieces seal is not acceptable. Contact lenses cannot be worn with any supplied air respirator. General safety recommendations indicate that contact lenses should not be worn in areas where there may be a likelihood of chemical splashes.

Jerry Berke M.D.

Authorized Examiner

x

Signature

04/25/03

Date

THE NATIONAL ENVIRONMENTAL TRAINERS

certify that

Chris Miller

has satisfactorily passed an exam and completed an 8-hour annual refresher training course entitled
Hazardous Waste Operations and Emergency Response
meeting the requirements identified in Title 29 CFR 1910.120.

This course has been awarded 1.0 Industrial Hygiene CE Points by the American Board of Industrial Hygiene-Approval Number 13334. This course is also eligible for 56 Continuance of Certification (CC) points from the Board of Certified Safety Professionals.



December 30, 2003

Signature of Instructor

A handwritten signature in black ink, appearing to read 'Clay Bednara', written over a horizontal line.

Clay Bednara, MS, CHMM (No. 3482)

U.S. ARMY CORPS OF ENGINEERS



PROFESSIONAL DEVELOPMENT SUPPORT CENTER
HUNTSVILLE, ALABAMA

CERTIFICATE

This is to certify that

Christopher G. Miller

Sevenson Environmental Services, Inc.

has completed the Corps of Engineers Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS

Given at SWNJ Res Ofc By Philadelphia 4/11/00
Location Instructional District Date

Mr. Joseph Hoag, (856) 241-1671
Facilitator


Chief, USACE Professional Development Support Center

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

03 17 94 10:52 215 633 9641

RUST REMEDIAL

002

RUST

Interoffice Correspondence

DATE: March 16, 1994

TO: Training File

FROM: Therese Perrette TP

SUBJECT: Chris Miller 40 Hour OSHA 1910.120 Training

Although there is no certificate indicating completion of the 40 Hour OSHA 1910.120 training, a records review of Mr. Miller's training shows that he meets the 1910.120 training requirements more than adequately. A summary of Mr. Millers training includes the following:

1. June 1987 - 40 Hours formalized training which meets 29 CFR 1910.120 requirements
2. August 1988 - 8 Hour Refresher Class
3. June 1990 - 40 Hour Site Safety Officer
4. July 1990 - 8 Hour Supervisors training which meets 29 CFR 1910.120 requirements
5. September 1990 - 8 Hour Refresher Class
6. September 1991 - 8 Hour Refresher Class
7. March 1992 - 8 Hour Supervisors training which meets 29 CFR 1910.120 requirements
8. September 1992 - 8 Hour Refresher Class
9. March 1993 - 8 Hour Refresher Class
10. February 1994 - 8 Hour Refresher Class

If there are any questions regarding Mr. Millers training records please contact Therese Perrette, Health and Safety Manager at 215-633-4425.



Certificate of Completion

this is to certify that

CHRISTOPHER G. MILLER

has successfully completed the
Chemical Waste Management, Inc.
Course in

SITE SAFETY OFFICER COURSE

on this 8th day of JUNE 1990

Michael P. McHenry
Instructor / Title

James W. Greeley
General Manager



Certificate of Completion

this is to certify that

CHRISTOPHER G. MILLER

has successfully completed the
Chemical Waste Management, Inc.
Course in

8.0 HOUR TRAINING FOR SUPERVISORS
HEALTH, SAFETY, AND ENVIRONMENTAL MANAGEMENT

on this 27th day of March, 1992

Hubert M. Gallagher - Env. Mgr.
Instructor Title

John Emery
General Manager



Certificate of Completion

this is to certify that

Christopher G. Miller

has successfully completed the

Chemical Waste Management, Inc.

Safety Training Program on

Health, Safety and Environmental Management

For Supervisors

on this 9th & 10th day of July 1990

Michael H. Gallacher
Michael H. Gallacher

Instructor

James W. ...

General Manager

HEALTH RESOURCES

600 West Cummings Park, Suite 3400
Woburn, Massachusetts 01801-6350
Phone: (781) 935 - 8581; (800) 350 - 4511
Fax: (781) 938 - 4678

Certificate For Respirator Use 29 CFR 1910.134

Employee's Name: Miller, Chris
Social Security No: 177-62-8781
Company: T.N. & Associates
Company Branch: Milwaukee, WI
Date Of Exam: 28 June 2004
Exam Location: South Jersey Hospital - Occupation Health Services Vineland, NJ

I have examined the above named individual and I certify that this employee:

is physically capable is not physically capable

of using a negative pressure, air supplied respirator and/or powered air purifying respirator subject to the following restrictions:

- Respirator use should be limited to air supplied or powered air purifying respirators. (positive pressure)
- No respirator use if wheezing and shortness of breath are evident.

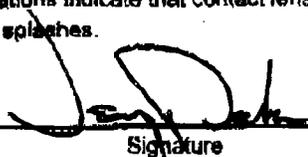
Comments:

Note: Prescription eyeglasses, contact lenses or beards cannot be worn with all types of respirators. Any interference with a face-to-face pieces seal is not acceptable. Contact lenses cannot be worn with any supplied air respirator. General safety recommendations indicate that contact lenses should not be worn in areas where there may be a likelihood of chemical splashes.

Jerry Berke M.D.

Authorized Examiner

x



Signature

7/1/2004

Date

HEALTH RESOURCES

600 West Cummings Park, Suite 3400

Woburn, Massachusetts 01801-6350

Phone: (781) 938 - 8581; (800) 350 - 4511

Fax: (781) 938 - 4678

Surveillance Examination Medical Release For Job Placement

Employee's Name: Miller, Chris

Social Security No: 177-62-8781

Company: T.N. & Associates

Company Branch: Milwaukee, WI

Date Of Exam: 28 June 2004

Exam Location: South Jersey Hospital - Occupational Health Services Vineland, NJ

Medical Surveillance Exam:

- Asbestos Hazmat Deleading Other _____
- Initial Periodic Exit Other _____

I have reviewed the examination of the above named individual per OSHA regulations and in my opinion:

- I have not detected any medical condition which would place the employee at increased risk of health impairment from work.
- I have detected a medical condition which would place an employee at increased risk of health impairment from work in the proposed job assignment.
- I have limited the employee's assigned work. Recommended limitations are:

- In evaluating the employee, it was determined that the employee is probably fit for work, but laboratory abnormalities were noted which require follow-up before fitness can be determined.
- As part of this evaluation, Blood Lead and Zinc Protoporphyrin testing were performed at an OSHA-CDC approved laboratory. Results were within acceptable limits.
- Other:

I have informed the employee of the results of the examination and any medical conditions which require further examination or treatment.

For asbestos examinations: The above employee has been informed of the health risks associated with smoking and asbestos exposure.

Jerry Berke M.D.

Authorized Physician

*



Signature

7/1/2004

Date



Certificate of Completion

Presented To

Joseph Clifford

September 18~22, 1989

In Recognition of Having Successfully Completed
 the Prescribed Course of Study for
 Hazardous Waste Site Activities
 40-Hour Initial
 Health and Safety Training

Robert J. Baker
 Corporate Safety Manager
 Geraghty & Miller, Inc.

Kevin J. Donohy
 Regional Health and Safety Manager
 Geraghty & Miller, Inc.

Canonie Environmental

1992

Certificate of Training

Presented To

JOSEPH CLIFFORD

For Successful Completion Of
Supervisors Safety Training for Hazardous Waste Operations
As Required By 29 CFR 1910.120(e)(4)

MARCH 18, 1992

Date Awarded

Tami A. Remick
Corporate Health & Safety Manager

Clayton A. Beck
Instructor


HEALTH RESOURCES
600 West Cummings Park, Suite 3400
Woburn, Massachusetts 01801-6350
Phone: (781) 935 - 8581; (800) 350 - 4511
Fax: (781) 938 - 4678
**Certificate For Respirator Use
29 CFR 1910.134**

Employee's Name: Clifford, Joseph

Social Security No: 150-56-6579

Company: T.N. & Associates

Company Branch: Raleigh, NC

Date Of Exam: 24 March 2004

Exam Location: South Jersey Hospital - Occupation Health Services Vineland, NJ

I have examined the above named individual and I certify that this employee:

is physically capable is not physically capable

of using a negative pressure, air supplied respirator and/or powered air purifying respirator subject to the following restrictions:

- Respirator use should be limited to air supplied or powered air purifying respirators.
(positive pressure)
- No respirator use if wheezing and shortness of breath are evident.

Comments:

Note: Prescription eyeglasses, contact lenses or beards cannot be worn with all types of respirators. Any interference with a face-to-face pieces seal is not acceptable. Contact lenses cannot be worn with any supplied air respirator. General safety recommendations indicate that contact lenses should not be worn in areas where there may be a likelihood of chemical splashes.

Jerry Berke M.D.

Authorized Examiner

x



Signature

3/26/2004

Date


HEALTH RESOURCES

600 West Cummings Park, Suite 3400
 Woburn, Massachusetts 01801-6350
 Phone: (781) 935 - 8581; (800) 350 - 4511
 Fax: (781) 938 - 4678

**Surveillance Examination
 Medical Release For Job Placement**

Employee's Name: Clifford, Joseph
 Social Security No: 150-56-6579
 Company: T.N. & Associates
 Company Branch: Raleigh, NC
 Date Of Exam: 24 March 2004
 Exam Location: South Jersey Hospital - Occupation Health Services Vineland, NJ

Medical Surveillance Exam:

- Asbestos Hazmat Deleading Other _____
 Initial Periodic Exit Other _____

I have reviewed the examination of the above named individual per OSHA regulations and in my opinion:

- I have not detected any medical condition which would place the employee at increased risk of health impairment from work.
 I have detected a medical condition which would place an employee at increased risk of health impairment from work in the proposed job assignment.
 I have limited the employee's assigned work. Recommended limitations are:

- In evaluating the employee, it was determined that the employee is probably fit for work, but laboratory abnormalities were noted which require follow-up before fitness can be determined.
 As part of this evaluation, Blood Lead and Zinc Protoporphyrin testing were performed at an OSHA-CDC approved laboratory. Results were within acceptable limits.
 Other:

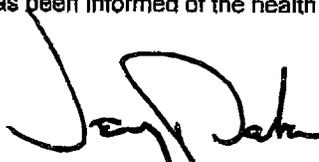
I have informed the employee of the results of the examination and any medical conditions which require further examination or treatment.

For asbestos examinations: The above employee has been informed of the health risks associated with smoking and asbestos exposure.

Jerry Berke M.D.

Authorized Physician

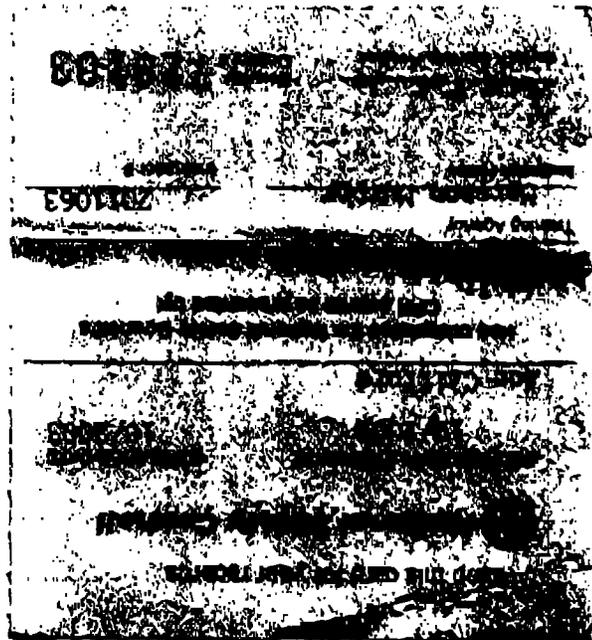
x



Signature

3/26/2004

Date



SAVE A LIFE, INC.

EXP. DATE

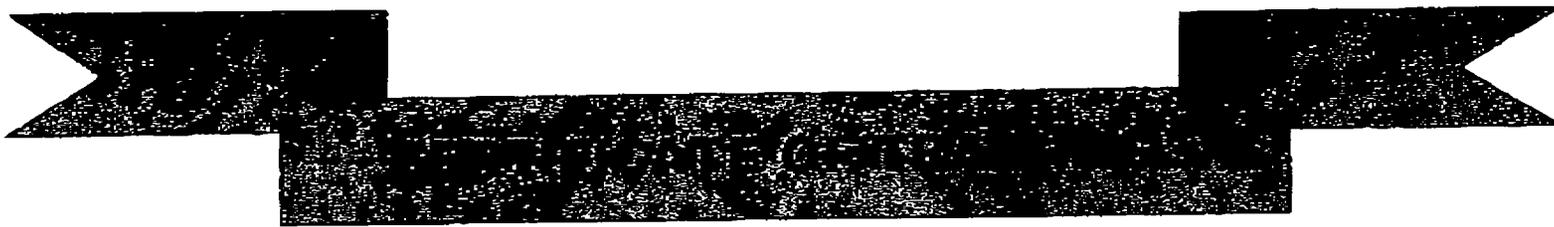
Joe Clifford

10/2005

**HAS SUCCESSFULLY COMPLETED
STANDARD FIRST AID**

**INSTRUCTOR: MARYANN MURPHY
856-845-5222**

PANTHER TECHNOLOGIES, INC.



THIS CERTIFIES THAT
JOSEPH CLIFFORD

HAS SUCCESSFULLY COMPLETED THE TRAINING REQUIREMENTS FOR
CONFINED SPACE ENTRY TRAINING
29 CFR 1910.146

prepared and conducted by
PANTHER TECHNOLOGIES, INC.
10/19/02


Peter J. Palko, P.E., CHMM
Office Health and Safety Manager
10/19/02

APPENDIX C

Site Safety Training And Inspection Forms And Logs

DAILY SAFETY TAILGATE MEETING FORM

Project Number: 2004-120
Site Name: IR Site 08 – NUSC DISPOSAL AREA, USWC, MIDDLETOWN, RI
Date: _____
SHSO: _____

ITEMS TO BE DISCUSSED WITH ALL PROJECT PERSONNEL:

- _____ Head and eye protection required on job – (hard hat, safety glasses)
- _____ Other protective equipment required – (steel-toed boots, ear plugs, gloves, chemicals suit, etc.)
- _____ Respiratory protective equipment, if required by Site conditions
- _____ Materials expected to be encountered on job and exposure limits (gasoline, diesel fuel, hydraulic fluids, waste oil, lubricants, etc., and their respective OELs)
- _____ Asbestos and Lead Awareness Training
- _____ Work zones and methods of security
- _____ Decontamination procedures (discuss steam cleaning of all contaminated equipment and personnel hygiene)
- _____ General safe work practices
- _____ Emergency procedures (fire extinguishers, first aid, gas detectors, hospital directions, and emergency numbers)

Other Items Discussed:

The following personnel were present for discussion of the topics listed above and have read and understand the contents of this Site Health and Safety Plan.

NAME	SIGNATURE	COMPANY	DATE
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____



T N & ASSOCIATES, INC.

Pre-Mobilization Safety Check List

A knowledgeable T N & Associates, Inc. (TN&A) project management representative shall fill out this form after the Site-Specific Safety and Health Plan has been completed. When completed, a copy shall be given to the Project Site Safety and Health Officer or Project Safety and Health Officer (before mobilizing site personnel or equipment). A copy shall be forwarded to the Corporate Safety and Health Manager.

Job Name: _____

Today's Date _____

Owner/Client _____

Project Address _____

Person Filling Out This Form (Name) _____

Your Relation to the Project _____

How many workers (including subcontractors) are expected on the job? _____

What is the starting and completion date of the project? _____

Administration And Meetings	Yes	No	N/A	Date
1. Is there a copy of the TN&A Site Specific Safety and health Plan (SSHP) on Site?				
2. Is there a copy of the TN&A Hazard Communication Program and MSDS manual on site?				
3. Is there a copy of the TN&A Corporate Safety and Health Manual on site?				
a. Personal Acknowledgment Form				
b. Daily Safety Tool Box Talk Record				
c. Respirator Test Fit Form				

Administration And Meetings Continued	Yes	No	N/A	Date
d. Accident and Crisis Management Forms				
e. Real Time Air Monitoring Logs, and Monitoring Equipment Calibration Forms				
f. OSHA 200 Form, as necessary.				
g. Job Site Posters				
4. Have TN&A site employees been trained for tasks to be performed? (This includes having records on file)				
5. Have employees received base line Medical Examinations? (This includes having records on file)				
6. Have employees been trained and properly fitted for respirators?				
7. Is there a TN&A Telephone Directory on site?				
8. Is there a field logbook on site to include Safety and Health issues?				

9.	Have subcontractors provided evidence of their employee training documents and written procedures?				
10.	Have special licenses or permits been obtained from city, county, state, or others?				
Medical Support		Yes	No	N/A	Date
11.	Are First Aid supplies are on hand and adequate for the project?				
12.	Are eye rinse stations or bottles been obtained for work areas?				
13.	Are nearest emergency medical facility hours and telephone numbers known and posted? (Includes calling facilities to ensure service and phone numbers are still existing)				
14.	Is there a phone system set up on site to call for emergency assistance?				
15.	Is the phone system set up on 911 response?				
16.	Is there a vehicle available for emergency transportation?				
17.	Does a member of the crew hold First Aid and CPR Certification?				

Personal Protection Equipment (PPE)		Yes	No	N/A	Date
18.	Is the following PPE available for employees?:				
a.	Hard Hat				
b.	Safety Glasses				
c.	Safety Harness (full upright body harness only)				
d.	Ear Plugs				
e.	Gloves				
f.	Is site-specific PPE available? (respirators, coveralls, etc.)				
g.	Other:				

Support Areas And Supplies		Yes	No	N/A	Date
19.	Have work zones boundaries been determined to keep unauthorized personnel out?				
20.	Has artificial illumination been provided?				
21.	Is there a hazard free area for employees to break and eat food?				
22.	Are there facilities for employees to wash their hands?				
23.	Are there trash bags for paper towels and contaminated PPE?				
24.	Is there a safe source of drinking water available for employees?				
25.	Has a smoking area been set up for employees? (with receptacle for butts)				
26.	Have an adequate number of toilets been provided for site personnel?				
27.	Are disinfectant moist towelettes provided (respirator/hand washing Level D)				
28.	Have arrangements been made to control dust on the project?				
29.	Is there cones and barricade tape for site control?				

Support Areas And Supplies Continued		Yes	No	N/A	Date
30.	Has duct tape been provided for sealing PPE?				
31.	Is a Tell Tail for wind direction provided for contaminated areas				

32. Have compressed air horns been provided?				
Utilities – underground and overhead	Yes	No	N/A	Date
33. Have Diggers Hotline or other utility companies been contacted?				
34. Has OSHA been notified of excavations where employees will enter at 5 feet in depth or greater?				
Equipment and Materials	Yes	No	N/A	Date
35. Are fire extinguishers available for use in vehicles, office(s), and applicable site areas?				
36. Has special equipment to control hazards been anticipated and provided for (i.e., shoring, air movers for ventilation, etc.)?				
37. Have storage areas for construction materials been designated?				
38. Will equipment used to handle materials (i.e., forklift, trucks, etc.) have room to operate safely?				
39. Are clearly designated traffic patterns, road layouts, and parking areas planned or existing?				
Controls For Personnel Protection	Yes	No	N/A	Date
40. Is the following equipment available for use and in working order?:				
a. Signs (Keep Out, Danger, Permit Required Confined Space, etc)				
b. Barricades (stand up)				
c. Barricade tape				
d. Flashers				
e. Orange Safety Vests				
f. Other				
Company Vehicular Operations	Yes	No	N/A	Date
41. Do the drivers have a valid driver's license?				
42. Are the safety devices on the vehicles in working order?				
43. Are safety checks conducted on vehicles prior to operating them?				
44. Are fire extinguishers and first aid kits and other safety equipment onboard vehicles present, in good condition, and inspected on a frequent basis?				
45. Are vehicles maintained on a regular maintenance schedule through the corporate fleet maintenance manager?				

T N & ASSOCIATES, INC.

Site Safety and Health Inspection Form

A knowledgeable T N & Associates, Inc. (TN&A) project management representative shall fill in each section and provide a copy to the Project Manager, Site Safety and Health Officer, and the Corporate Safety and Health Manager. A sheet for comments is provided at the end of this form for observations that require explanation.

Job Name: _____

Today's Date _____

Owner/Client _____

Project Address _____

Person Filling Out This Form (Name) _____

Your Relation to the Project _____

Not

OK OK N/A

Documentation and Meetings

- | | | | |
|-----|-----|-----|---|
| ___ | ___ | ___ | 1. Is there a copy of the TN&A Safety and Health Plan on site? |
| ___ | ___ | ___ | 2. Is the TN&A Site-Specific Safety and health Plan available for site personnel to read? |
| ___ | ___ | ___ | 3. Is a map (with phone number and address) to a emergency medical facility, and job site posters posted in a conspicuous location? |
| ___ | ___ | ___ | 4. Is there a current file with TN&A and subcontractor's medical and training records on site? |
| ___ | ___ | ___ | 5. Is there a field logbook on site that includes recent entries on Safety and Health? |
| ___ | ___ | ___ | 6. Are Daily Safety Tool Box Talks being conducted and documented? |

Medical Support

- | | | | |
|-----|-----|-----|--|
| ___ | ___ | ___ | 7. Are First Aid supplies adequate for the project? |
| ___ | ___ | ___ | 8. Have eye rinse stations been up set for work areas? |
| ___ | ___ | ___ | 9. Does a member of the crew hold First Aid and CPR Certification? |

Not

OK OK N/A

Site Areas

- | | | | |
|-----|-----|-----|--|
| ___ | ___ | ___ | 10. Are designated traffic patterns, road layouts, and parking areas being followed by site personnel? |
| ___ | ___ | ___ | 11. Are work zones boundaries established and effective to keep unauthorized personnel out? |
| ___ | ___ | ___ | 12. Is lighting adequate to perform work safely? |
| ___ | ___ | ___ | 13. Is dust on the project being controlled properly? |

Break Areas

- | | | | |
|-----|-----|-----|--|
| ___ | ___ | ___ | 14. Is there a safe area for employees to break and eat food with clean water, place to wash hands, and clean toilet facilities? |
| ___ | ___ | ___ | 15. Is there a safe area for workers to smoke with a receptacle for extinguishing cigarettes? |

Personal Protection Equipment (PPE)

___ ___ ___ 16. Are employees wearing the proper PPE for work performed?

Equipment

___ ___ ___ 17. Is equipment being inspected before use? (Tools, machines, etc.)

___ ___ ___ 18. Has equipment purchased or rented been equipped with the necessary safety devices? (Horn, backup alarm, etc.)

Storage Areas

___ ___ ___ 19. Have storage areas been set up to store flammable (gas, oil, etc.) in a safe manner with MSDSs available?

___ ___ ___ 20. Are containers clearly identified with labels and hazard warnings?

___ ___ ___ 21. Is lumber being stored in a safe manner? (Hand stacked lumber mustn't be stacked more than 15 feet high. Machine stacked lumber mustn't be stacked more than 20 feet high)

___ ___ ___ 22. Have storage areas been designed to keep oxygen and acetylene at least 20 feet apart?

___ ___ ___ 23. Does equipment used to handle materials (i.e., forklift, trucks, etc.) have room to operate safely?

Fire Prevention

___ ___ ___ 24. Are there "No Smoking" signs posted in areas with flammables?

___ ___ ___ 25. Are fire extinguishers available for use (charged with a current inspection tag, and safety pin and seal) in vehicles, office(s), and necessary site areas?

Not

OK OK N/A Housekeeping & Construction Safety

___ ___ ___ 26. Are the ends of rebar, metal stakes, (nails in lumber pulled) or other similar hazards removed, made visible or padded so that workers passing in aisle ways are not impaled or injured?

___ ___ ___ 27. Are work areas clear of *unnecessary* materials and debris?

___ ___ ___ 28. Are framing or building structures able to support the loads that are placed on them?

___ ___ ___ 29. Are persons protected from passing under buckets on pulley systems overhead hazards unaware?

___ ___ ___ 30. Are personnel protected from masonry walls potentially collapsing while being constructed? (Limited access zone should be established for walls 4 feet in height on side without scaffold. Walls 8 feet or greater in height should be braced)

Ladders

___ ___ ___ 31. Do ladders appear to be in good condition and positioned on level ground?

___ ___ ___ 32. Are ladders resting securely at top, unable to shift sideways with at least 3 feet of rail above the landing? (Should be tied off to the object on which it rests)

___ ___ ___ 33. Are ladders positioned with the at least 1/4 forth of the length of the ladder (horizontal distance) between the bottom of the ladder and the object on which it rests?

___ ___ ___ 34. Are workers working on, ascending, and descending ladders in a safe manner?

Electrical Installations

___ ___ ___ 35. Has lockout/tagout been performed to de-energized equipment?

___ ___ ___ 36. Are workers wearing metal such as jewelry, or metal hard-hats or using metal ladders while working on equipment connected to a source of electrical power? (Mustn't be)

___ ___ ___ 37. Have electrical panels (panels in service) been left open unattended? (Mustn't be)

___ ___ ___ 38. Have work zones been barricaded with caution tape to keep other workers out of areas where high voltage or "live" work is being performed?

Hand and Power Tools

___ ___ ___ 39. Do power tools have safety devices in place consistent with the manufacturer's recommendations? (such as abrasive wheel guards on grinders)

___ ___ ___ 40. When not in use, are power tools placed in a location or in a manner that is safe for persons working around them? (Tools should not be placed where they can trip persons unaware, or be energized with the trigger facing straight up while on the ground where they can be stepped on)

___ ___ ___ 41. Are electrical cords in good condition, and protected from damage by vehicles or work activities?

___ ___ ___ 42. Are electrically powered tools protected by the use of a ground fault circuit interrupter and assured grounding system?

Not

OK OK N/A

Welding, Cutting, and Brazing

___ ___ ___ 43. Are welders adequately controlling sparks and slag from combustible or flammable materials around the work space?

___ ___ ___ 44. Is there a check valve installed at the gauge of all compressed gas cylinders?

___ ___ ___ 45. If necessary, are screens/shields provided to protect other personnel from welding arc rays?

___ ___ ___ 46. Are gas hoses, electrical leads, and equipment in good condition?

Excavations and Protective Systems

___ ___ ___ 47. Has U.S.A. and/or other utility companies been contacted before excavating?

___ ___ ___ 48. Has OSHA been notified that workers will be entering excavations that are 5 feet or greater in depth?

___ ___ ___ 49. Is the competent person keeping a current log of excavation inspections?

___ ___ ___ 50. Is heavy equipment (trucks, bulldozers, etc.) able to enter excavations without the threat of tipping or rolling over (have equipment ramps been provided)?

___ ___ ___ 51. Is there a clear pathway (at least 2 feet) between excavations and spoil piles for workers to walk?

___ ___ ___ 52. Are excavations barricaded to provide adequate visibility to workers and nearby traffic that excavations are present?

___ ___ ___ 53. Are protective systems (shoring, benching, sloping) being used properly to prevent cave-in (to protect workers, adjacent roads, sidewalks and structures)?

___ ___ ___ 54. Have ladders (or other safe means of egress) been provided in excavations?



Heavy Equipment Certification

TO: T N & Associates, Inc. (TN&A)

DATE: _____

FROM: _____

Project Name _____

Project Location: _____

(1) This form provides certification of machinery and mechanized equipment to be used on the referenced project for the following work:

Description of equipment work:	
Project Site:	
Subcontractor providing equipment:	
Address:	
Dates (duration) of equipment work:	

(2) Inspection and certification of machinery and mechanized equipment, as required by TN&A has been made prior to, but within seven calendar days' advance, of use on the project site. Re-certification will be required for equipment that is used on the project site for more than one year.

	Identification of equipment (make, model, serial no.)	Date of Certification
1		
2		
3		

(3) The above listed equipment has been inspected and tested as indicated above, and is **certified to be in safe operating condition by the following competent individual:**

Name		Title
Company		
Signature		Date

(4) If there are any questions regarding this certification, please contact the following TN&A representative:

Certification of Decontamination

PROJECT NAME _____

PROJECT LOCATION: _____

(1) This form provides certification of decontamination of vehicles, machinery and mechanized equipment that have been used on the referenced project for the following work:

Subcontractor providing equipment:	
Address:	

(3) Decontamination and certification of machinery and mechanized equipment, as required by TN&A has been made through the use of pressure water washing and visual inspection. Gross removal of potentially contaminated soils and debris has been removed from tires, tracks, undercarriages, and other accessible areas of the equipment.

	Identification of equipment (make, model, serial no.)	Date of Certification
1		
2		
3		

(3) The above listed equipment has been decontaminated, visually inspected and **certified to be decontaminated in accordance with established Standard Operating Procedures:**

Name		Title
Company		
Signature		Date

(5) If there are any questions regarding this certification, please contact the following TN&A representative:

APPENDIX D

Material Safety Data Sheets and Hazardous Material Inventory Form **(FIELD INSERTED)**

SENSIDYNE INC -- HYDROGEN CYANIDE AMPULE -- 6665-00N045305

===== Product Identification =====

Product ID:HYDROGEN CYANIDE AMPULE
 MSDS Date:06/01/1989
 FSC:6565
 NIIN:00N045305
 MSDS Number: BVNPR
 === Responsible Party ===
 Company Name:SENSIDYNE INC
 Address:16333 BAY VISTA DRIVE
 City:CLEARWATER
 State:FL
 ZIP:34620
 Country:US
 Info Phone Num:813-539-0550
 Emergency Phone Num:800-451-9444;800-424-9300 (CHEMTREC)
 CAGE:63882

=== Contractor Identification ===

Company Name:SENSIDYNE INC
 Address:16333 BAY VISTA DR
 Box:City:CLEARWATER
 State FL
 ZIP:34620
 Country:US
 Phone:800-451-9444/813-530-3602
 CAGE:63882

===== Composition/Information on Ingredients =====

Ingre Name:NITROGEN
 CAS:7727-37-9
 RTECS #:QW9700000
 Fraction by Wt: >99%
 OSHA PEL:N/K
 ACGIH TLV:ASPHYXIAN

Ingre Name:HYDROCYANIC ACID; (HYDROGEN CYANIDE) (SARA III)
 CAS:74-90-8
 RTECS #:MW6825000
 Fraction by Wt: 0.1%
 OSHA PEL:4.7 PPM STEL, S
 ACGIH TLV:10 PPM, S, C
 EPA Rpt Qty:10 LBS
 DOT Rpt Qty:10 LBS

Ingre Name:SUPP DATA: 30-60 MINS CAN CAUSE DEATH. IN ACUTE HIGH
 EXPOSURE CAUSES, DEATH IS VERY RAPID, THOUGH BRTHG MAY (ING 4)
 RTECS #:9999999ZZ

Ingre Name:ING 3:CONTINUE FOR A FEW MINS. IN LESS ACUTE CASES THERE IS
 HIGH, DIZZ, UNSTEADINESS OF GAIT, A FEELING OF (ING 5)
 RTECS #:9999999ZZ

Ingre Name:ING 4:SUFFOCATION, & NAUSEA. WHERE THE PATIENT RECOVERS
 THERE IS RARELY ANY DISABILITY.
 RTECS #:9999999ZZ

Ingred Name:FIRST AID PROC:INGEST: QUICKLY GIVE CONSCIOUS VICTIM A PINT OF 1% SODIUM THIOSULFATE SOLN & INDUCE VOMIT. REPEAT.(ING 7)
RTECS #:9999999ZZ

Ingred Name:ING 6: USE AMYL NITRITE PERLES (LILLY CYANIDE ANTIDOTE KIT).
RTECS #:9999999ZZ

=====
Hazards Identification

LD50 LC50 Mixture:NONE SPECIFIED BY MANUFACTURER.
Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:NITROGEN:NITROGEN IS NONTOXIC & IS CLASSIFIED AS A SIMPLE ASPHY BY DISPLACEMENT OF OXYGEN. EXPOSURE SYMPS DEPEND ON THE DEGREE & DURATION OF OXYGEN DEFICIENCY. SYMPS CAN INCL INCR FREQUENCY & VOL OF BRTH G, INCR PULSE RATE, MUSCULAR INCOORD, FATIGUE, NAUS, VOMIT & COLLAPSE, BRTHG A PURE NITROGEN ATMOSPHERE(EFTS OF OVEREXP)
Explanation of Carcinogenicity:NOT RELEVANT
Effects of Overexposure:HLTH HAZ:CAUSES IMMEDIATE UNCONSCIOUS. DEATH FOLLOWS UNLESS AIR/OXYGEN BRTHG IS QUICKLY RESTORED. HYDROGEN CYANIDE: VERY TOX & CAPABLE OF ENTERING THE BODY THROUGH SKIN, BY INHAL OR ORALLY. A PROPLASMIC POISON , HCN COMBINES IN BODY TISSUES W/ENZYMES ASSOC W/CELLULAR OXIDATION. THERE IT RENDERS O2 UNAVAIL TO TISS & (SUPP DATA)
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

=====
First Aid Measures

First Aid:EYE: FLUSH EYES IMMEDIATE W/COPIOUS AMTS OF WATER FOR @ LST 15 MIN. CONSULT MD. WATCH FOR SYMPS OF CYANIDE POISONING. SKIN:FLUSH AFFECTED AREAS W/A LOT OF WATER. CONSULT MD. WATCH FOR SIGNS OF CYANIDE POISONING. INHAL: REMOVE TO FRESH AIR. RESTORE/SUPPORT BRTHG AS NEC. GET MED HELP. OBSERVE FOR SYMPS OF CYANIDE POISONING. FOR UNCONSCIOUS VICTIMS, HAVE A TRAINED PERSON ADMIN AMYL NITRITE PERLES. (ING 6)

=====
Fire Fighting Measures

Flash Point:NONE
Lower Limits:NONE
Upper Limits:NONE
Extinguishing Media:SUITABLE FOR SURROUNDING FIRE.
Fire Fighting Procedures:FIREFIGHTERS SHOULD WEAR SCBA UNITS TO PROTECT AGAINST POSSIBLE TOXIC DECOMPOSITION PRODUCTS.
Unusual Fire/Explosion Hazard:FIRE ENCOMPASSING THE AMPULES WILL EMIT TOXIC FUMES OF CYANIDES AND NOX.

=====
Accidental Release Measures

Spill Release Procedures:PROVIDE ADEQUATE VENTILATION. AMPULES CONTAIN ONLY 10 CC OF DILUTE HCN. CALIBRATION GAS MAY BE VENTED TO ATMOSPHERE. AVOID CUTS FROM BROKEN GLASS AMPULES.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

=====
Handling and Storage

Handling and Storage Precautions:STORE IN THE ORIGINAL CONTAINER IN A COOL DRY PLACE. PROTECT FROM LIGHT, HEAT AND PHYSICAL DAMAGE.

Other Precautions:DO NOT BREATHE CALIBRATION GAS. AVOID CUTS FROM
BROKEN GLASS AMPULES. WASH HANDS PRIOR TO EATING, DRINKING, SMOKING
AND APPLYING COSMETICS AFTER PRODUCT USE.

=====
Exposure Controls/Personal Protection
=====

Respiratory Protection:NO RESPIRATORY PROTECTION IS REQUIRED FOR NORMAL
AMPULE USE. NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE
OF CONCERN .

Ventilation:LOCAL EXHAUST OR LAB FUME HOOD IS ADEQUATE.

Protective Gloves:SAFETY GLOVES.

Eye Protection:ANSI APPRVD CHEM WORK (OTHER PROT EQUIP)

Other Protective Equipment:NONE SPECIFIED BY MANUFACTURER. EYE PROT:
GOGGLES W/FULL FSHLD

Work Hygienic Practices:NONE SPECIFIED BY MANUFACTURER.

Supplemental Safety and Health

BP:-320.4F, (-195.8C) 1 ATM. MATLS TO AVOID: MATLS CAN RSLT IN EXPLO.
EFFECTS OF OVEREXP:CAN CAUSE DEATH DUE TO ASPHY. SUSPENSION OF TISS
OXIDATION LASTS ONLY WHILE THE CYANIDE IS PRESENT; UPON ITS REMOVA
I. NORMAL FUNCTION IS RESTORED PROVIDED DEATH HAS NOT ALREADY
OCCURED. EXPOSURES OF 100-200 PPM FOR (ING 3)

=====
Physical/Chemical Properties
=====

HCC:G.

Boiling Pt:B.P. Text:SUPP DATA

Spec Gravity:1 (H2O=1)

Solubility in Water:SLIGHT

Appearance and Odor:COLORLESS GAS WITH ALMOND ODOR.

=====
Stability and Reactivity Data
=====

Stability Indicator/Materials to Avoid:YES

INCOMPATIBLES INCL LITHIUM, OXIDIZERS, AND ALKALINE MATLS. UNDER
CERTAIN CNDTNS HCN CNTCT W/STRONG ALKALINE (SUPP DATA)

Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products:WHEN HEATED TO DECOMPOSITION WILL EMIT
CYANIDES AND NOX.

=====
Disposal Considerations
=====

Waste Disposal Methods:PLACE BROKEN GLASS IN TRASH CNTNR DESIGNED FOR
BROKEN GLASS. DISPOSE VIA NORMAL LANDFILL. CONSULT LOCAL
AUTHORITIES TO ASSURE COMPLIANCE WITH LOCAL, STATE AND FEDERAL
REGULATIONS.

Disclaimer (provided with this information by the compiling agencies):
This information is formulated for use by elements of the Department
of Defense. The United States of America in no manner whatsoever,
expressly or implied, warrants this information to be accurate and
disclaims all liability for its use. Any person utilizing this
document should seek competent professional advice to verify and
assume responsibility for the suitability of this information to their
particular situation.

SARA TITLE YES NO
 REPRO HAZARD YES NO
 CARCINOGENIC YES NO

MSDS
955

S6340-AA-MMA-010 REVISION 4

2/1/1



MATERIAL SAFETY DATA SHEET (MSDS)

Serial No. 519
(Assigned by Code 04)

Identity (As Used on Label) OTTO FUEL II		Other Names N/A	
Section I. General			
Manufacturer Indian Head Division Naval Surface Warfare Center 101 Strauss Avenue Indian Head, MD 20640-5035		Emergency Telephone Number 301-743-4438 Telephone Number for Information 301-743-4659 Date Prepared 1/6/98	
Section II. Summary of Hazards			
Low fire hazard when exposed to heat or flames. Potentially toxic combustion byproducts. Otto Fuel II is an irritant through inhalation, skin contact, and eye contact. The first symptoms of overexposure to Otto Fuel II are usually headache, nasal congestion, nausea, or dizziness. Primary effects of overexposure include vasodilation, central nervous system depression, and methemoglobin formation. Persons with an increased risk of exposure are: persons with hypertension, anemia, hyperthyroidism, and cardiovascular disease. Persons with underlying heart disease may develop chest pain or suffer heart attacks when removed from chronic exposure.			
Section III. Emergency and First Aid			
Inhalation	Remove to fresh air immediately. Seek prompt medical attention if overexposure symptoms are present. Oxygen breathing, aspirin, or hot black caffeinated coffee can help alleviate headache.		
Eye Contact	Immediately flush eyes with large quantities of potable water or saline solution for at least 15 minutes. The eyelids shall be held open and occasionally lifted while the eyes are being flushed with water.		
Skin Contact	Immediately remove contaminated clothing and wash contaminated skin areas thoroughly with soap and warm water. Seek prompt medical attention if irritation persists. Do not use solvents to remove OTTO Fuel II.		
Ingestion	Do not induce vomiting. Qualified medical personnel should consider the use of activated charcoal or gastric lavage. Seek prompt medical attention.		
Emergency Medical Treatment Procedures	Seek prompt medical attention.		

Figure I-1. Otto Fuel II Safety Data (Sheet 1 of 5)

5-NOV-04

Identity OTTO FUEL II		
Section IV. Health Hazards/Symptoms of Exposure		
Summary of Acute Hazards	The first symptoms of overexposure to Otto Fuel II are usually headache, nasal congestion, nausea, or dizziness. Primary effects of overexposure include vasodilation, central nervous system depression, and methemoglobin formation.	
ROUTE OF EXPOSURE	SIGNS AND SYMPTOMS	PRIMARY ROUTE OF ENTRY
Inhalation	Nasal congestion may be an early sign of exposure. Headaches, low blood pressure, dizziness, mental disorientation and disequilibrium may occur.	X
Eye Contact	Local irritation and decreased visual acuity.	X
Skin Contact	Local irritation and may be absorbed through the skin to cause headache, nausea, or dizziness. May cause yellowish discoloration of skin.	X
Ingestion	Ingestion of OTTO Fuel II may cause nausea, vomiting, rapid heartbeat, collapse, or possible death.	
Chronic Hazards (long term)	Chronic overexposure may be associated with an increased risk of cardiovascular disease, including heart attacks or angina. No component of OTTO Fuel II is a suspected carcinogen by OSHA, IARC, or NTP.	
Section V. Protective Equipment and Control Measures		
Respiratory	NIOSH/MSHA approved full-faced pressure demand self-contained breathing apparatus (SCBA) is required if airborne concentration levels exceed established limit (Section X).	
Eye	Chemical splash goggles. Wear a full length face-shield (in addition to goggles) when performing any operation where splashing of OTTO Fuel II could occur.	
Skin	Clothing consists of disposable shirts per A-A-50390, disposable trousers per A-A-55201, and disposable aprons per A-A-55121. Rubber gloves per MIL-G-87066 for handling operations. Boots per A-A-50371 for clean-up of major spills. Booties per A-A-50391 for routine handling operations..	
Engineering Controls	Ventilation is required for enclosed handling areas to ensure personnel are not exposed to vapors in excess of 0.3 mg/m PEL-TWA. Emergency eyewash and safety showers within workplace.	
Other Hygienic and Work Practices	No eating, drinking, or smoking within the workplace. Contact local industrial hygienist for guidance. OTTO FUEL II MANUFACTURING OPERATIONS: wear neoprene gloves, flame-resistant coveralls, conductive-sole shoes, and a flame-resistant cap.	

Identify OTTO FUEL II		
Section VI: Fire and Explosion		
Flash Point (method) 265°F by Cleveland	Autoignition Temp (method) DSC Exotherm onset ~125°C (257°F) at 2°C/min, sealed pan	Flammable Limits (% vol in air) Lower Upper Unknown
Fire And Explosion Hazards:	Low fire hazard when exposed to heat or flame. A self-oxidizing material and cannot be smothered. Classified as non-explosive but can be exploded when a strong booster is employed or adiabatically compressed (pressurized).	
Extinguishing Media:	Cool the propellant below 250° F using a finely dispersed low velocity water fog. A carbon dioxide fire extinguisher may be used.	
Special Fire Fighting Procedures.	Finely dispersed low velocity water fog. Carbon dioxide fire extinguisher or dirt for small fires. Hazardous by-products for open burning is carbon monoxide, and torpedo combustion are carbon dioxide, carbon monoxide, hydrogen cyanide and nitrogen dioxide	
Section VII: Spill and Disposal		
Large Spill:	Shut off ignition sources. No smoking, flames, or flares in hazard area. Evacuate area for 250 feet in all directions. Keep unnecessary people away. Require use of NIOSH/MSHA approved respiratory protection and impervious clothing. Confine spill using same method for minor spill response. Containerize all contaminated material for proper disposal.	
Small Spill	Confine spill. Use absorbent material such as diatomaceous earth (kitty litter), clean sawdust, or rags to collect the bulk of the spilled fuel. Wipe contaminated area with a cloth or sponge dampened with ethyl or isopropyl alcohol, or acetone. Clean area with soap and water.	
Waste Disposal Methods	Note: This information applies only to Otto Fuel II as manufactured or reclaimed. RCRA: Hazardous waste if discarded: D003 Contaminated Otto Fuel II: Refer to State and local regulations and/or restrictions for proper waste disposal procedures.	
Section VIII: Handling and Storage		
General Handling Procedures	Recommended storage limits: -18 F to 140 F. Bulk storage tanks shall be provided with pressure relief devices to prevent internal pressure build-up over 50 psig.	
Storage Requirements	Other fuels, oxidizers, and open flames shall not be in or near OTTO Fuel II storage areas. Use POP approved OTTO Fuel II drums, Bulkainers, and Tankers for storage. Observe all Federal, State, and local regulations when storing this material.	

Identity OTTO FUEL II			
Section IX: Stability and Reactivity			
Stable?	Yes X	No	Conditions to Avoid Avoid heat, sparks, open flame, and other sources of ignition.
Incompatibility (Materials to avoid)	Buna-N materials, copper, vinyl-based material, acids, oxidizers.		
Hazardous Decomposition ByProducts	Potential toxic products include carbon monoxide, carbon dioxide, nitrogen dioxide, and hydrogen cyanide. Combustion must occur for these by-products to appear.		
Hazardous Polymerization?	Yes	No X	Conditions to Avoid Unknown
Impact Sensitivity (mm)	Unknown	Other: N/A	
Friction Sensitivity (psig)	Unknown	Other: N/A	
ESD Sensitivity (joules)	Unknown	Other: N/A	
Section X: Hazardous Ingredients/Identity Information			
Hazardous Components		OSHA PEL (mg/m³)	ACGIH TLV (mg/mg³) Other Limits
Propylene Glycol Dinitrate (PGDN) (CAS 8423-43-4)	76.0 wt% nom.	0.3(0.05 ppm)	0.3(0.05 ppm)
2-Nitrodiphenylamine (2-NDPA) (CAS 119-75-5)	1.5 wt% nom	N/A	N/A
Di-n-butyl Sebacate (DBS) (CAS 109-43-3)	22.5 wt% nom	N/A	N/A
*Navy Limits for OTTO Fuel II are: 0.3 milligrams of OTTO Fuel II per cubic meter of air, based on 8-hour time weighted average (TWA) measurements. Excursions may not exceed three (3) times the TWA per period which equals or exceeds 30 minutes at any time during the workday. Excursions may not exceed five (5) times the TWA at any time during the workday. Refer to (29CFR 1910.1200) OSHA Hazard Communication Standard.			
OTTO Fuel II is an orange-red, free-flowing, oily liquid that is more dense than water; however, when in a thin layer (i.e., spill, stain, or leak), OTTO Fuel II is a yellow-orange color. OTTO Fuel II is a stable, liquid monopropellant composed of a nitrate ester in solution with a desensitizing agent and a stabilizer.			

Page 4 of 5 Rev. 5

Figure I-1. Otto Fuel II Safety Data (Sheet 4 of 5)

Identity OTTO FUEL II	
Section XI. Physical and Chemical Data	
Boiling Point (indicate °F or °C) N/A	250°F
Vapor Pressure (mm Hg) Less than 1 mm Hg at STP	0.0877 @ 77°F
Vapor Density (Air = 1)	> 1
Specific Gravity (water = 1)	1.232
Melting Point (indicate °F or °C)	-18°F
Evaporation Rate (Butyl Acetate = 1)	Unknown
Solubility in Water Insoluble	
Appearance and Odor Reddish-orange liquid with a disagreeable odor.	
Section XII. Other Information	
Health (blue)	 2
Contact (white)	 2
Fire (red)	 1
Reactivity (yellow)	 1
<p style="text-align: center;">Hazardous Material Warning Label (for Indian Head Division use only)</p> <p>0 = no significant hazard 1 = slight hazard 2 = moderate hazard 3 = severe hazard</p> <p>1.3 = mass fire explosive 1.1 = mass detonating explosive</p> <p style="text-align: center;">ND = hazard has not yet been determined</p>	
Shipping Name	Environmentally hazardous substance, liquid, N.O.S., UN 3082, Class 9 (Otto Fuel II)
DOT Hazard Class	Class 9
DOT Shipping Label	Class 9
TSCA Status	Note: This information applies only to Otto Fuel II as manufactured or reclaimed. All components are listed in the TSCA Inventory.
CERCLA/SARA	Report spills per 40 CFR 302.6 and 40 CFR 372.30
RCRA	Otto Fuel II intended for disposal is a reactive hazardous waste and has an EPA waste number of D003.
State Regulatory Information	For further details refer to OTTO Fuel II Tech. Manual, S6340-AA-MMA-010; contact NSWC (301) 743-4315 x1176 to obtain a copy.

APPENDIX E

Site Maps



Figure 1 Site Location Map – Middletown, RI

Figure 2 Hospital Route Map



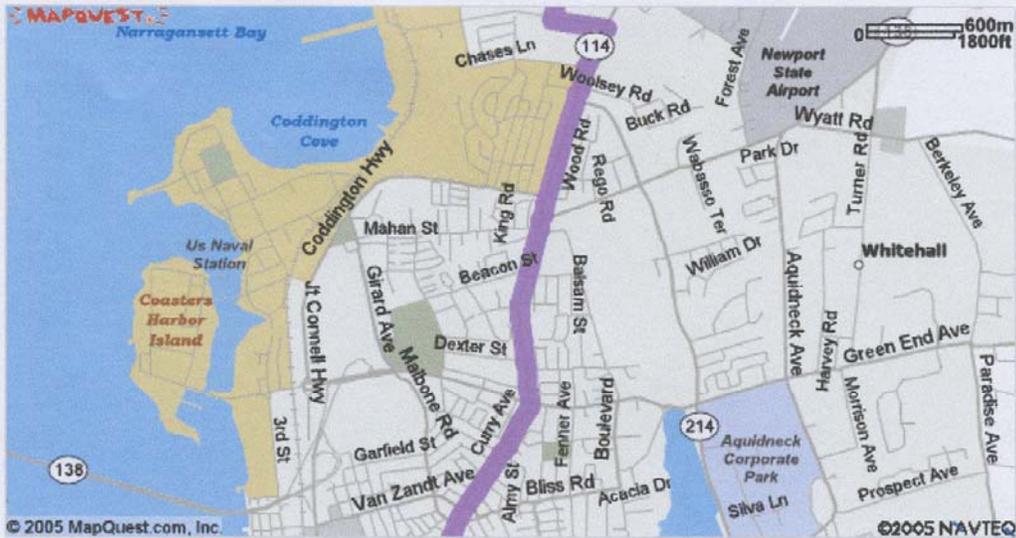
Start: [1-199] Commerce Dr
Middletown, RI 02842, US

End: 11 Friendship St
Newport, RI 02840-2271, US

Directions	Distance
 1: Start out going SOUTH on COMMERCE DR toward NORTHGATE RD.	<0.1 miles
 2: Turn LEFT onto NORTHGATE RD.	0.2 miles
 3: Turn RIGHT onto RI-114/W MAIN RD. Continue to follow W MAIN RD.	1.5 miles
 4: Stay STRAIGHT to go onto BROADWAY.	0.6 miles
 5: Turn LEFT onto FRIENDSHIP ST.	<0.1 miles
 6: End at 11 Friendship St Newport, RI 02840-2271, US	

Total Est. Time: 8 minutes

Total Est. Distance: 2.56 miles



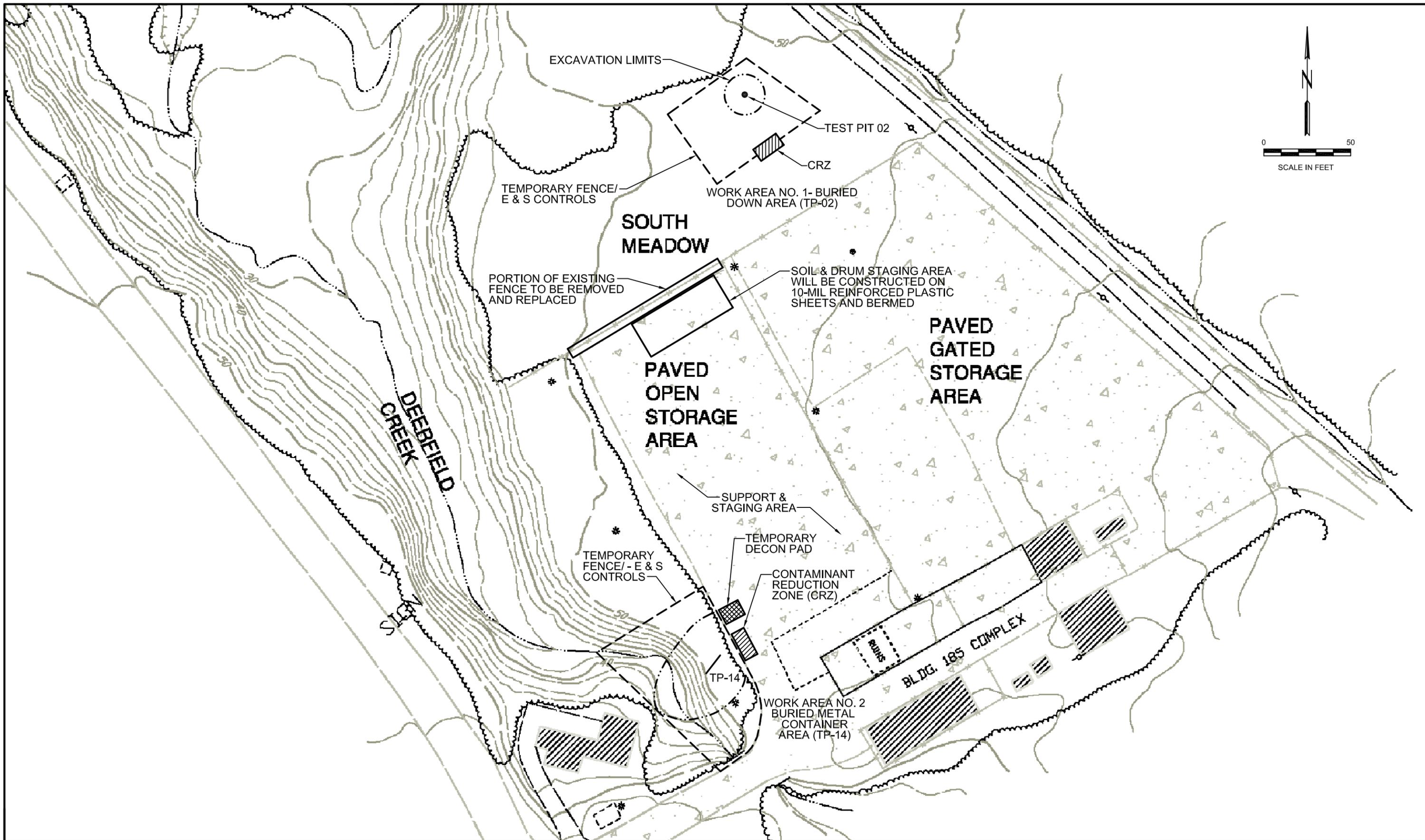
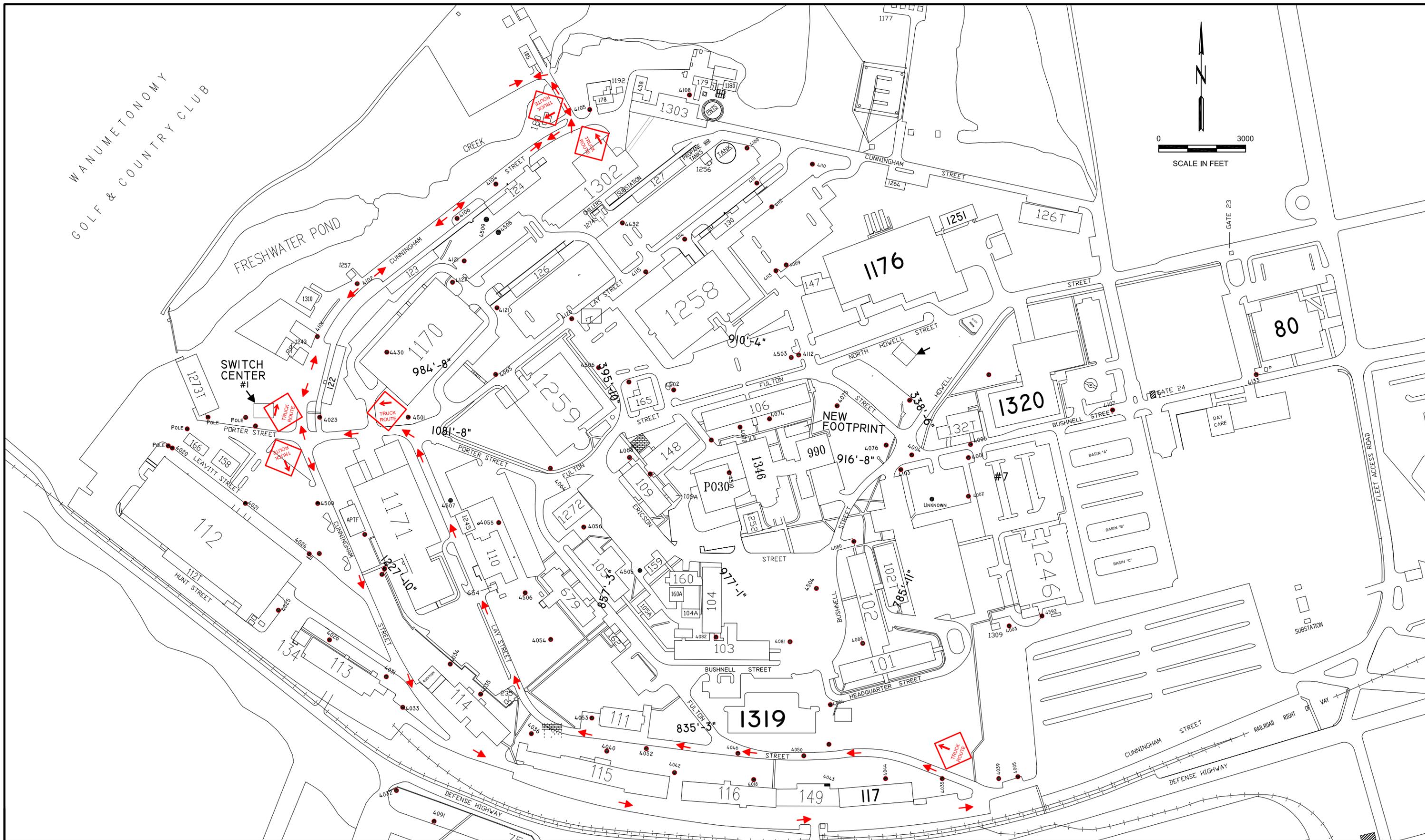


FIGURE 3
WORK AREA LAYOUT

IR SITE 08 - NUSC DISPOSAL AREA
NAVAL WARFARE CENTER
MIDDLETON, RI



**FIGURE 4
HAUL ROUTE**

**IR SITE 08 - NUSC DISPOSAL AREA
NAVAL WARFARE CENTER
MIDDLETON, RI**

APPENDIX F

Accident Reports



ACCIDENT REPORTS

General Liability Report – Property Damage and Loss –

To be completed in the event of
equipment or other property damage

Vehicle Accident Report – for TN&A Vehicles

Accident Investigation Report

to be completed by the supervisor
to determine accident causes and corrective actions
(TN&A FORM)

Near Miss Occurrence Report –

To be completed in the event of any
“near miss” in which no property damage or
personal injury occurred but may have occurred



GENERAL LIABILITY REPORT PROPERTY DAMAGE AND LOSS

Facility Name and Address:	
Project Name/Number:	
Description of Property Damage or Loss:	
Estimated \$ Value of Damage or Loss:	
Location of damaged/lost/stolen property (before loss):	
Were Pictures Taken of Damage? YES or NO	Were Police Notified? Yes or NO Department: Report No.:
Date and Time of Damage/Loss/Theft:	
Were Hazardous Materials Released? YES or NO	If YES, describe materials:
Owner of Damaged/Stolen Property: Address: Telephone No:	
Personal Injuries? YES or NO (If YES, complete the section below) <i>Complete A TN&A Accident Investigation Report for injured employees</i>	
Injured parties: 1. Name: Employer:	Telephone No: Address:
2. Name: Employer:	Telephone No: Address:



GENERAL LIABILITY REPORT

PROPERTY DAMAGE AND LOSS

Witnesses:			
1. Name:		Telephone No:	
Employer:		Address:	
2. Name:			
Employer:		Telephone No:	
		Address:	
Investigated by:	Print Name	Signature	Date
Employee			
Supervisor			
Reviewed by:	Print Name	Signature	Date
Corp. SHM			

Was this report sent or called into TN&A Corporate office? YES or NO

VEHICLE ACCIDENT REPORT

ACCIDENT DESCRIPTION

Accident Date	Time:
Location: City, State	
Description of Accident:	
Witness:	Telephone No:
Address:	
Police Officer	Department:
<input type="checkbox"/> Passengers? YES or NO <input type="checkbox"/> Injuries? YES or NO	<input type="checkbox"/> Weather: Circle One Clear Cloudy Fog Rain Sleet Snow Other: Describe
<input type="checkbox"/> Pavement: Circle One Asphalt Steel Concrete Wood Gravel/Dirt Brick Other: Describe	<input type="checkbox"/> Conditions: Circle One Dry Wet Icy Pot Holes Other: Describe
<input type="checkbox"/> Roadway: Circle One Residential Divided Highway Undivided Highway No. of lanes in each direction:	<input type="checkbox"/> No. of Vehicle towed from scene: <input type="checkbox"/> Number of Injuries <input type="checkbox"/> Number of Fatalities
<input type="checkbox"/> Were Hazardous Materials Released? YES or NO <input type="checkbox"/> If YES, describe materials:	

Was vehicle accident report sent or called into TN&A Corporate office? YES or NO

TN&A VEHICLE

Driver:	License No:	State
Address	City:	State/ZIP:
Work Telephone:	Project Name/Number:	
Vehicle No.:	Make/Model/Year:	
License Plate No:		State:
Owner: Circle One TN&A Leased/Rented Private Owner		
Vehicle Type: Circle One Commercial Motor Vehicle Non-Commercial Motor Vehicle		
Owner Name:		Tel: No.:
Address:	City:	State/ZIP:
Vehicle Damage:		

OTHER VEHICLE

Driver:	License No:	State
Address	City:	State/ZIP:
Work Telephone:	Project Name/Number:	
Vehicle No.:	Make/Model/Year:	
License Plate No:		State:
Owner: Circle One TN&A Leased/Rented Private Owner		
Vehicle Type: Circle One Commercial Motor Vehicle Non-Commercial Motor Vehicle		
Owner Name:		Tel: No.:
Address:	City:	State/ZIP:
Vehicle Damage:		
Additional Information:		



Vehicle Accident Report, continued

Draw and name roadways showing each vehicle, direction of and travel and point of impact. Indicate travel before the accident with a solid line and post-accident movement with a broken line.

Key: 1=Your Vehicle; 2=Other Vehicle(s); 3=Pedestrian; 4=Stop Sign; 5=Yield; 6=Railroad

Completed by:	Print Name	Signature	Date
Employee			
Supervisor			
Project Manager			
Site Safety and Health Officer			



ACCIDENT INVESTIGATION REPORT

This report is to be completed following the injury or illness or TN&A personnel. Answer all questions as completely as possible. Forward this report to the TN&A Corporate Safety and Health office within 24 hours of the accident. See instructions for directions to complete this form.

IDENTIFICATION			
Date and Time of Accident:		Date Reported:	
Employee Involved:	Position:	Date Employed:	Experience on the Job:
Location:			
Name of Project/Project No.:			
Supervisor:		Witnesses:	
INCIDENT			
Accident Resulted in: <input type="checkbox"/> Injury <input type="checkbox"/> Illness <input type="checkbox"/> Property Damage	Recordability: <input type="checkbox"/> First Aid <input type="checkbox"/> Medical <input type="checkbox"/> Lost Time	Nature of Injury: Part of Body:	Type of Accident:
Description of Accident:			
ANALYSIS			
Describe Hazards, Unsafe Condition(s) or Acts:			
Describe Underlying Cause(s) or Failures:			

ACCIDENT INVESTIGATION REPORT

CONTROLS	
Recommended Corrective Action:	
Action Taken:	
FOLLOW UP: Scheduled:	Conducted By:

Investigated by:	Print Name	Signature	Date
Employee			
Supervisor			

Reviewed by:	Print Name	Signature	Date
Corp. SHM			

ACCIDENT INVESTIGATION REPORT

Page 3 of 4

Instructions:

Remember, an accident investigation is not designed to find fault or blame. It is an analysis to determine causes that can be controlled or eliminated.

IDENTIFICATION

This section is self-explanatory. When completing the form, complete the whole section.

INCIDENT

Accident resulting in: Check appropriate box

Recordability: Check appropriate box based on:

- First Aid – Resulted in a minor injury/treatment administered by trained first aider-on premises.
- Medical Treatment – Resulted in more serious injury/treatment administered by physician, emergency room-off premises.
- Lost Time – Employee missed more than ½ day from work.

Provide a brief description of the following:

- Nature of the injury – Principle physical characteristics/what happened to employee, i.e.; sprain, contusion, burn, laceration, etc.
- Part of body – Body part directly affected by injury, i.e.; hand, fingers, arm, back, shoulder, etc. Be specific.
- Type of accident – Brief classification of type of accident, i.e.; material handling (lifting, pulling, pushing), contact with hot substance, slip/trip/fall, struck by/against, fall from elevator, etc.

Description of Accident: Describe in detail what happened; where it happened; why it happened; how it happened; what materials, equipment or conditions were involved; when it happened, etc. Provide prompt, accurate, thorough information.

Instructions: (continued)

ANALYSIS

Describe all hazard(s), condition(s) or act(s) which contributed to the accident:

- Unsafe conditions – hazardous or unsafe physical condition or circumstance, i.e.; congested production area, improperly designed workstation or tools, spill (grease, oil, water, etc.) on the floor, inadequate lighting, poor housekeeping, defective equipment, weights handled, poor ventilation, etc.
- Unsafe acts – Unsafe work practice, i.e.; failure to place warning signs/tags/signals, leaving spills on floor, using defective equipment, horseplay, substance abuse, failure to use personal protective equipment, etc.

Describe all underlying cause(s) or failure(s) which contributed to the accident:

- Underlying causes/failures – Frequency or repetition of a task, improper postures, possible safety program deficiencies, i.e.; ineffective rules/regulations, ineffective employee training, inadequate or unsafe job procedure, etc.

CONTROLS

Unsafe conditions and unsafe acts are symptoms of the underlying causes of accidents. Accident investigations should strive to identify the *underlying* causes, and recommendations should address corrective actions, both administrative and physical in nature. Consideration should be given to the physical work environment, managerial controls, and individual characteristics all of which contribute to industrial actions.

FOLLOW UP

Once investigations are completed, they should be periodically reviewed. This will ensure that proper controls were implemented and that the corrective actions remain a part of the safety program.

The CSHM is a good source to assist in conducting this review. The CSHM can determine if the investigations are completed in a timely manner, if they are thorough and if they are accurate. The CSHM will recommend any additional corrective action needed and monitor the implementation of any recommended controls.



NEAR MISS OCCURRENCE REPORT

This report is to be completed following a “near miss” incident that does not result in an injury or illness. Please answer all questions as completely as possible. **Forward this report to the TN&A Corporate Safety and Health office within 24 hours of the incident.**

Date:	Time of Incident:
Location: City, State	
Name of Project/Project No.:	
Description of Near Miss Incident	
Name(s) of Witnesses:	Telephone No:
What unsafe physical condition(s) or unsafe act(s) contributed to the near miss?	
What systematic or management deficiencies contributed to the near miss?	
List corrective action items, responsible person, scheduled completion date:	

Investigated by:

	Print Name	Signature	Date
Employee			
Supervisor			

Reviewed by:

	Print Name	Signature	Date
Corp. SHM			

INVESTIGATING ACCIDENTS

When investigating an accident,
try to find out:

- **What** happened (fall, spill, shock, etc.)?
 - **When** (exactly) did it happen?
 - **Where** (exactly) did it happen?
 - **Who** was involved?
- **How** did it happen (including steps and events that preceded the incident)?
 - **Why** did it happen?

How can similar events be prevented in the future

APPENDIX G

Health and Safety Plan Amendments

(FIELD INSERTED)

**This appendix is set up to contain
any future Amendments to the
HASP**