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DRAFT PHASE 1 INTERIM CORRECTIVE MEASURES WORK PLAN FOR SOLID WASTE
MANAGEMENT UNITS 1 AND 2 WITH TRANSMITTAL NAVAL ACTIVITY PUERTO RICO
11/18/2009
RIGHT WAY ENVIRONMENTAL CONTRACTORS, INC.

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November 19, 2009

U.S. Environmental Protection Agency - Region II
290 Broadway – 22nd Floor
New York, New York 10007-1866

Attn: Mr. Adolph Everett, P.E.
Chief, RCRA Programs Branch

Re: Contract N69450-09-C-0072
Corrective Action for SWMUs 27, 28, 29 and Pico Del Este
Naval Activity Puerto Rico, Ceiba, Puerto Rico
U.S. Naval Activity Puerto Rico (NAPR)
EPA I.D. No. PR2170027203
Draft Phase I Interim Corrective Measures Work Plan for SWMUs 1 and 2

Dear Mr. Everett:

Right Way Environmental Contractors, Inc. (RWEC), on behalf of the Navy, is pleased to provide you with one hard copy and one electronic copy provided on CD of the Draft Phase I Interim Corrective Measures Work Plan for SWMUs 1 and 2. Additional distribution has been made as indicated below.

The Navy is requesting an expedited review on this submittal due to the limited available time to conduct the proposed work. The debris piles are located in low lying areas that are susceptible to wet conditions during the wet season in Puerto Rico. Typically, January and February are the driest months out of the year in Puerto Rico and provide the best time of the year to successfully implement the debris removal portion of the Interim Corrective Measure at SWMU 1. Therefore, we are requesting an expedited review of these work plans in order to perform the debris removal portion of the work during January and February 2010 to avoid the wet conditions at SWMU 1.

If you have questions regarding this submittal, please contact Mr. Mark Davidson at (843) 743-2124.

Sincerely,

Right Way Environmental Contractors, Inc.



Pedro R. Tejada
Vice President

Attachments

cc: Ms. Debbie R. Sanders, BRAC PMO SE (letter only)
Mr. David Criswell, BRAC PMO SE (letter only)
Mr. Mark E. Davidson, BRAC PMO SE (1 hard copy and 1 CD)
Mr. Pedro Ruiz, NAPR (1 CD)
Mr. Mark E. Kimes, P.E., Michael Baker Jr., Inc. (1 hard copy and 1 CD)
Mr. Tim Gordon, US EPA Region II (1 hard copy and 1 CD)
Mr. Carl Soderberg, US EPA Caribbean Office (1 hard copy and 1 CD)
Mr. Gloria Toro, PR EQB (1 hard copy and 1 CD)
Ms. Willmarie Rivera, PR EQB (1 CD)
Mr. Felix Lopez, US F&WS (1 CD)
Mr. Anthony Scacifero, TechLaw, Inc. (1 CD)



DRAFT PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN FOR SWMUs 1 AND 2

For:



**NAVAL ACTIVITY PUERTO RICO
EPA I.D. No. PR2170027203
CEIBA, PUERTO RICO**

Prepared for:

**Department of the Navy
NAVFAC SOUTHEAST
North Charleston, South Carolina**



Prepared by:

Right Way Environmental
Contractors, Inc.
Naranjito, Puerto Rico

and

Baker

Michael Baker Jr., Inc.
Moon Township, PA

Contract No. N69450-09-C-0072

November 19, 2009

**Corrective Action for SWMUs 27, 28, 29, and Pico Del Este,
Naval Activity Puerto Rico, Ceiba, Puerto Rico**

DRAFT
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 and 2

NAVAL ACTIVITY PUERTO RICO
EPA I.D. NO. PR2170027203
CEIBA, PUERTO RICO

NOVEMBER 19, 2009

Prepared for:

DEPARTMENT OF THE NAVY
NAVFAC SOUTHEAST
North Charleston, SC

Under:

Contract No. N69450-08-C-0093

Prepared by:

RIGHT WAY ENVIRONMENTAL CONTRACTORS, INC.
Naranjito, Puerto Rico 00719

and

MICHAEL BAKER JR., INC.
Moon Township, Pennsylvania

I certify under penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that this document and its attachments were prepared either by me personally or under my direction or supervision in a manner designed to ensure that qualified and knowledgeable personnel properly gather and present the information contained therein. I further certify, based on my personal knowledge or on my inquiry of those individuals immediately responsible for obtaining the information, that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowingly and willfully submitting a materially false statement.

Signature: _____

Name: _____

Title: _____

Date: _____

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- Appendix B - Site Specific Safety and Health Plan
- Appendix C - Project Forms
- Appendix D - Project Schedule

LIST OF ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
ANSI	American National Standards Institute
Baker	Michael Baker Jr., Inc.
BERA	Baseline Ecological Risk Assessment
bgs	Below Ground Surface
BRAC	Base Realignment and Closure
CD	Construction Debris
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CNRSE	Commander, Navy Region Southeast
CO	Contracting Officer
COE	United States Army Corps of Engineers
COR	Contracting Officer's Representative
CQC	Contractor Quality Control
DDD	(1,1-dichloro-2,2-bis(<i>p</i> -chlorophenyl)ethane)
DDE	(1,1-dichloro-2,2-bis(<i>p</i> -chlorophenyl)ethylene)
DDT	(1,1,1-trichloro-2,2-bis(<i>p</i> -chlorophenyl)ethane)
DFW	Definable Features of Work
DI	Dionized
DPW	Department of Public Works
DQCR	Data Quality Control Report
ECP	Environmental Condition of Property
EM	Engineering Manual
FVR	Field Variance Report
ft	Feet
IAS	Initial Assessment Study
ICM	Interim Corrective Measure
LANTDIV	Naval Facilities Engineering Command, Atlantic Division
NAPR	Naval Activity Puerto Rico
NAVFAC	Naval Facilities Engineering Command
NCR	Nonconformance Report
NDE	Nondestructive Examination
NEESA	Naval Energy and Environmental Support Activity
NEPA	National Environmental Policy Act
NSRR	Naval Station Roosevelt Roads
NTR	Navy Technical Representative

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

OSHA	Occupational Safety and Health Administration
PGM	Program Manager
PM	Project Manager
PMO	Program Management Office
POC	Point of Contact
PPE	Personal Protective Equipment
PREQB	Puerto Rico Environmental Quality Board
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
QCSM	Quality Control Systems Manager
RCRA	Resource Conservation and Recovery Act
RWEC	Right Way Environmental Contractors, Inc.
SE	Southeast
SHM	Safety and Health Manager
SOW	Statement/Scope of Work
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SWMU	Solid Waste Management Unit
US	United States
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

This document provides guidance for successful completion of the first phase of an Interim Corrective Measure (ICM) at Solid Waste Management Units (SWMUs) 1 and 2 on Naval Activity Puerto Rico (NAPR), Ceiba, Puerto Rico. Activities described herein are in accordance with the requirements of Contract Number N62450-08-C-0093. This Work Plan applies only to activities performed by Right Way Environmental Contractors, Inc. (RWEC) and its subcontractors under the above-referenced contract.

The purpose of the ICM is to delineate the extent of surface soil contamination by performing soil sampling and analysis at SWMUs 1 and 2 and to reduce the risk of environmental contamination by removing surface debris at SWMU 1. A future ICM, consisting of a surface soil removal, will be completed at SWMUs 1 and 2 at locations determined by the results of the delineation sampling described in this Work Plan. The scope of the soil removal will be detailed in a future Work Plan.

This document is divided into nine sections. Section 1 introduces the document, provides site location, background and history; scope of work (SOW), and ICM objectives. The project organization is provided in Section 2. Section 3 presents the general requirements. Project activities are discussed in Section 4. The Environmental Protection Plan is presented in Section 5 and the Contractor Quality Control (CQC) Plan is presented in Section 6. Section 7 provides project documentation and reporting requirements. The project schedule is presented in Section 8. References are provided in Section 9.

The attached appendices contain auxiliary document information. This includes the following:

- Appendix A: Organizational Chart
- Appendix B: Site Safety and Health Plan (SSHP)
- Appendix C: Project Forms
- Appendix D: Project Schedule

1.1 Purpose

This Work Plan has been prepared to provide overall guidance for the successful completion of surface soil contaminant delineation at SWMUs 1 and 2 and surface debris removal at SWMU 1. It also describes the coordination activities and sequence of events necessary to ensure the proper and timely completion of work.

1.2 Site Location, Background and History

1.2.1 Naval Activity Puerto Rico

NAPR occupies over 8,800 acres on the northern side of the east coast of Puerto Rico along Vieques Passage with Vieques Island lying to the east about 10 miles off the harbor entrance (see Figure 1-1). NAPR also occupies the immediately adjacent islands of Piñeros and Cabeza de Perro, as presented on Figure 1-2. The northern entrance to NAPR is about 35 miles east along the coast road (Route 3) from San Juan. The property consists of 3,938 acres of upland (developable) property and 4,955 acres of environmentally sensitive areas including wetlands, mangrove, and wildlife habitat. The closest large town is Fajardo (population approximately

37,000), which is about 5 miles north of NAPR off Route 3. Ceiba (population approximately 17,000) adjoins the west boundary of NAPR (see Figure 1-1).

The facility was commissioned in 1943 as a Naval Operations Base, and designated as a Naval Station in 1957. Naval Station Roosevelt Roads (NSRR) operated as a Naval Station from 1957 until March 31, 2004. NSRR was one of the largest naval facilities in the world with more than 100 miles of paved roads, approximately 1,300 buildings, a large scale airfield (Ofstie Field), a deep water port and over 30 tenant commands. NSRR played a major role in providing communication support to the Atlantic and Caribbean areas and also served as a major training site for fleet exercises.

Section 8132 of fiscal year 2004 Defense Appropriations Act, signed into law on September 30, 2003, directed that NSRR be disestablished within six months, and that the real estate disposal/transfer be carried out in accordance with procedures contained in the Base Realignment and Closure (BRAC) Act of 1990. This legislation required that the base closure be conducted in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended by the Community Environmental Response Facilitation Act (CERFA). NSRR has undergone operational closure as of March 31, 2004 and has been designated as Naval Activity Puerto Rico. The mission of NAPR is to protect the physical assets remaining, comply with environmental regulations, and sustain the value of the property until final disposal of the property. NAPR will continue until the real estate disposal/transfer is completed.

In anticipation of operational closure of NSRR the Naval Facilities Engineering Command, Atlantic Division (LANTDIV) prepared Phase I/Phase II Environmental Condition of Property (ECP) Reports to document the environmental condition of NSRR. The Draft Phase I Environmental Condition of Property Report dated March 31, 2004 (LANTDIV, 2004) identified new sites at NAPR based on the results of a review of records, an analysis of historic aerial photographs, physical site inspections, and interviews with persons familiar with past and current operations and activities. The new ECP sites had not been previously identified or investigated under existing environmental program areas. A Phase II ECP field investigation was performed in 2004 to conduct environmental sampling to determine if a release/disposal actually occurred at any of the sites recommended for further evaluation in the Phase I ECP and, if so, whether any potential risk to human health was present. The Final Phase II Environmental Condition of Property Report recommended additional sampling (to be undertaken as part of the Resource Conservation and Recovery Act [RCRA] Program) at several sites to permit a more detailed assessment (Naval Facilities Engineering Command [NAVFAC] Atlantic, 2005).

The United States Environmental Protection Agency (USEPA) issued a RCRA 7003 Administrative Order (Environmental Protection Agency Docket No. RCRA-02-2007-7301), which identified a number of [SWMUs 1 and 2] as having documented releases of solid and/or hazardous waste and hazardous constituents, and required follow-on actions. Following a public comment period the Consent Order became effective on January 29, 2007 (USEPA 2007).

The following subsections provide a brief discussion of the background of each of the sites addressed in this Work Plan. The location of SWMUs 1 and 2 is shown on Figure 1-2.

1.2.2 SWMU 1-Army Cremator Disposal Site

SWMU 1, located adjacent to and east of the Navy Lodge, encompasses an area of roughly 116 acres of land (see Figure 1-2). The SWMU is bounded to the north by Kearsage Road leading to the U.S. Customs Pier, Ensenada Honda to the east, estuarine wetlands to the south, and the Navy Lodge and Bowling Alley to the west. In addition to the upland habitat depicted on Figure 1-3,

estuarine wetland and open water habitat are included within the boundary of SWMU 1. Based on previous reports, the Army Cremator Disposal Site operated from the early 1940s until the early 1960s and was the main station landfill during this period. The waste material was disposed of by piling, burning, and compacting (A.T. Kearney, Inc., 1988). According to the Naval Energy and Environmental Support Activity (NEESA), an estimated 100,000 tons of waste, including scrap metal, inert ordnance, batteries, tires, appliances, cars, cables, dry cleaning solvent cans, paint cans, gas cylinders, construction debris, dead animals, and residential waste was disposed of at this SWMU (NEESA, 1984). No reliable information exists regarding the amounts of material present in the disposal area that could be hazardous; however, in 1984, an Initial Assessment Study (IAS) team estimated that as much as 1,000 tons of hazardous material could be present (NEESA, 1984). Previous investigations completed at SWMU 1 indicate the presence of pesticides (4,4'-DDD, 4,4'-DDE, 4,4' DDT) and metals (antimony, cadmium, copper, lead, tin, mercury and zinc) in the surface soil (0-1 feet [ft] below ground surface [bgs]).

1.2.3 SWMU 2-Langley Drive Disposal Site

SWMU 2 is located along Langley Drive, approximately 1,000 ft northeast of the Navy Commissary and encompasses an area of approximately 28 acres as presented in Figure 1-2. This site consists of an abandoned, unlined waste-pile/landfill, on the edges of, and protruding into the mangroves along the shoreline of Ensenada Honda. This site was utilized from 1939 to 1959 for disposal of solid and possibly hazardous wastes/constituents. Previous studies conducted at this site indicate the presence of metals (antimony, copper, lead, and mercury) in the surface soil (0-1 ft bgs and 1-2 ft bgs).

1.3 Project Statement of Work

The objective of this project is to perform delineation sampling at SWMUs 1 and 2 and to remove surface debris at SWMU 1.

The following activities will be performed:

- Coordinate schedule with the NAPR Public Works point of contact (POC);
- Obtain appropriate clearance and identification for all personnel and vehicles;
- Install site access controls where necessary;
- Clear and grub as required for unimpeded access;
- Survey and stake proposed soil sample locations as identified on Figures 1-3 and 1-4;
- Obtain delineation soil samples at specified locations;
- Survey and stake all planned debris removal areas in accordance with limits indicated on Figure 1-5;
- Set up equipment laydown area and waste debris staging area (as needed);
- Mobilize appropriate equipment to lay down area;
- Perform debris removal;

- Transport waste debris to appropriate disposal facility ensuring tracking documentation is completed;
- Demobilize from NAPR;
- Obtain final disposition documentation from disposal facility;
- Produce closeout reports.

2.0 PROJECT ORGANIZATION

This section identifies and defines responsibilities of the principal decision-makers and persons responsible for implementing the work (see Appendix A, Organizational Chart).

2.1 U.S. Department of the Navy – NAVFAC Southeast

The Contractor's responsibility is directly to the Contracting Officer (CO) via the Contracting Officer's Representative (COR). Any requested change and/or deviation in scope will be brought to the attention and approved by the CO. In no case will changes to the contract scope of work be made at the activity level or by any person other than the CO. If work outside the SOW is required (i.e., over-excavation) the CO or COR will be notified immediately. This notification will be via email and telecom and will be initiated by RWEC. The CO for this project is Debbie R. Sanders. Her contact information is as follows:

BRAC Program Management Office, Southeast (SE)
Attention: Debbie Sanders
4130 Faber Place Drive, Suite 202
North Charleston, South Carolina 29405
843-743-2145
debbie.sanders@navy.mil

Inherent to this project is the potential to remove material in excess of initial estimates. The project has been scoped such that unit pricing will be used to compensate RWEC based on the amount and types of material removed. RWEC will closely monitor the quantity of waste debris. In the event that the budgeted estimated quantities will be approached, RWEC will notify the CO. The CO will authorize any change that is required for quantities of soils disposed.

The Navy Technical Representative (NTR) is RWEC's point of contact for day-to-day project communication and project deliverables. The NTR is responsible for Navy technical review and approval of all deliverables prepared by the Contractor. The NTR coordinates technical input as required or requested by the contractor and may provide recommendations and/or information to the CO. RWEC and the NTR understand that the CO is responsible for authorizing, in writing, any changes in scope. Mark Davidson is the NTR for this project. His contact information is as follows:

BRAC Program Management Office, SE
Attention: Mark Davidson
4130 Faber Place Drive, Suite 202
North Charleston, South Carolina 29406
843-743-2130
Mark.Davidson@navy.mil

2.2 U.S. Department of the Navy - NAPR Department of Public Works

At NAPR, Pedro Ruiz represents the Department of Public Works (DPW) and has the responsibility for Navy oversight of field activities at NAPR which includes assisting contractors with successfully executing site cleanup projects.

2.3 U.S. Environmental Protection Agency – Region 2

Tim Gordon has overall responsibility to ensure the environmental program at NAPR is in compliance with the USEPA environmental program. USEPA will review the Work Plan, construction drawings, and the project closeout reports for this ICM.

2.4 Puerto Rico Environmental Quality Board

Wilmarie Rivera has overall responsibility to provide oversight for Puerto Rico's Environmental Quality Board (PREQB). All interaction with Puerto Rico EQB will be through the designated Navy POC.

2.5 Right Way Environmental Contractors

RWEC has the ultimate responsibility for the successful execution of this project, as measured by achieving the project goals within the planned schedule and budget. RWEC subcontractors will adhere to RWEC's quality control (QC) program to ensure that corporate and project QC standards are met.

The selection of personnel to perform specific QC functions is based on their experience related to the work being performed and their educational qualifications. Personnel selection for project delivery activities are based upon an evaluation of the staff member's education, work experience, and training.

2.5.1 Program Manager

The program manager (PGM), Pedro Tejada, will have the overall responsibility for all technical, contractual, safety, and administrative matters for RWEC under this contract. He will ensure a high degree of client responsiveness is maintained. Additionally, he will be responsible for overseeing staff selection, monitoring contract and task funds and schedules, and ensuring quality assurance (QA) processes are being implemented. Mr. Tejada will delegate day-to-day project management to the Project Manager (PM) and QC management to the Quality Control Systems Manager (QCSM).

2.5.2 Project Manager

Pedro Tejada will also serve as the RWEC's PM for this project. As PM, Mr. Tejada will:

- Track project progress and communicate progress via updated project schedules and budgets;
- Supervise daily project execution;
- Establish work teams for specific tasks;
- Allocate assigned resources for optimum work execution;
- Conduct direct and frequent technical communication with the BRAC Program Management Office (PMO) SE, NTR, and the Public Works office;
- Ensure early identification and resolution of technical problems;

- Identify, communicate, and execute potential or desired modifications to the SOW;
- Assign and track field QC while assuring its effectiveness through review of documentation and communication with the CQC Officer;
- Assign and track site safety and health responsibilities by reviewing site safety and health documentation and communication with the Site Safety and Health Officer (SSHO);
- Serve as a primary point of contact for incidence reporting;
- Address and resolve QC nonconformance issues;
- Prepare project progress reports.

Mr. Tejada will be RWEC's primary contact person with the Navy. He will be in regular contact with the NTR regarding project status, potential schedule, cost impacts, and QC issues.

2.5.3 Quality Control System Manager

The QCSM for this contract is Alejandro Rodriguez. The QCSM is responsible for the development and interpretation of QC policies and procedures, and carries the requisite authority to oversee and execute QC activities for the projects that will be implemented under this contract. The QCSM is responsible for establishing the definable features of work (DFWs) and the appropriate QC monitoring and testing. He will provide overall direction to the program QC function; perform audits, surveillance, and document reviews; and execute other quality functions as required in the CQC Plan. He will interface with the PM on the quality functions of the program and will coordinate all QC activities. Implementation of the QC duties will be delegated to the QC Officer in the field.

Duties of the QCSM include, but are not limited to, the following:

- Implementing the project QC requirements;
- Overseeing onsite QC staff;
- Identifying and reporting nonconforming items or activities;
- Initiating or recommending corrective actions;
- Verifying implementation of corrective actions;
- Notifying the QA Director of conditions adverse to quality that cannot be resolved at the project level;
- Overseeing activities to monitor operations for compliance with contract requirements.

2.5.4 Safety and Health Manager

The Safety and Health Manager (SHM) for this contract is Luis A. Rios. He has the overall responsibility for the RWEC Corporate Safety and Health Program. Under this project, the SHM reports directly to RWEC's PGM Pedro Tejada.

The SHM is responsible for the development of safety and health policies and procedures, and carries the requisite authority to oversee and execute safety and health activities for the projects that will be implemented under this contract. The SHM is responsible for all aspects of the SSHP. The SHM will provide overall direction of safety and health functions perform safety inspections and document reviews as required by the SSHP. Any proposed deviations from the SSHP or changes in the expected site conditions are immediately presented to the SHM for consideration and approval. The SHM will interface with the PM on the safety and health performance of the program and will coordinate all safety and health activities. Implementation of the safety and health duties will be delegated to the Site Safety and Health Officer (SSHO) in the field.

2.5.5 Site Superintendent

The Site Superintendent for this project is Alejandro Rodriguez. The Site Superintendent is responsible for managing all aspects of project implementation in the field including quality, safety, and coordinating the activities of task-specific groups, subcontractors, or teams working on the project. The Site Superintendent is also the primary interface with the NTR and the NAPR Public Works department in the field. The Site Superintendent will report directly to the PM, and will provide the PM with daily progress reports. The Site Superintendent will be accessible at all times while the field activities are in progress.

2.5.6 Site Safety and Health Officer

Luis A. Rios will also serve as the Site Safety and Health Officer (SSHO). In this role, Mr. Rios will be responsible for ensuring all work is conducted in compliance with the SSHP. In his role as SSSH, Mr. Rios will report directly to the SHM. For functional safety issues, the SSSH has the authority to enforce all safety and health issues in the field, including the authority to stop work for safety violations and as a result of nonconformance with the SSHP. No field activities will be performed at any time without the presence of the SSSH, and the SSSH will remain on site for the duration of any field activities.

2.5.7 Other On-Site Personnel

All site personnel will be required to adhere to the procedures set forth in this Work Plan. The QC Officer and the SSSH will be responsible for ensuring that site personnel perform all aspects of the work in accordance with the Work Plan, the CQC Plan, and the SSHP.

2.6 Subcontractors

RWEC will direct and control all subcontractors for this project. Contractual agreements between RWEC and its subcontractors contain flow-down clauses that require subcontractors to meet all appropriate regulations and requirements. Onsite subcontractors will coordinate their activities through the Site Superintendent and will be required to submit daily logs documenting their activities. All subcontractors will be required to adhere to the procedures set forth in this Work Plan. The PM will be responsible for ensuring that subcontractors perform all aspects of the work in accordance with the CQC Plan and SSHP.

3.0 GENERAL REQUIREMENTS

3.1 Security Requirements and Facility Access

RWEC will initiate facility access requests for RWEC and subcontractor personnel as soon as possible to avoid potential project start delays.

3.2 Site Controls

RWEC will erect temporary construction barriers (i.e., fencing or caution tape) around active work sites where necessary to deter entry by unauthorized personnel. Barriers will meet the standard of the United States Army Corps of Engineers (COE) Engineering Manual (EM) 385-1-1 for Class III perimeter protection (COE EM 385-1-1; Chapter 25 and Appendix Q). Fences will be constructed of orange construction safety fence fabric hung on steel posts set at 10-foot intervals. Fencing and/or caution tape will be used in circumstances where heavy or moving equipment is in close proximity to public roads or high-traffic areas and to prevent inadvertent entry to sites where equipment is being used. Safety fences will also be erected around areas where there is potential for vehicular or foot traffic.

RWEC will also keep at least one person at the job site at all times during work hours for site surveillance. Heavy equipment will be parked in designated areas each night and the keys will be removed. All tools and equipment will be properly stored and work areas will be maintained in an orderly and organized manner.

3.3 Protection of Existing Structures and Utility Clearances

RWEC will take necessary measures to protect existing structures, facilities, and utilities that may be affected by removal and cleanup activities. Before intrusive work is initiated at the sites, a site inspection will be performed to identify potential site hazards, such as overhead power lines and structures or other features that require special attention. RWEC will be responsible for locating and clearing utilities. Utility markings will be maintained throughout construction activities. RWEC will avoid unnecessary disturbance of all utilities and will protect any utilities that may be impacted by the interim corrective measures implementation.

3.4 Safety Requirements

RWEC will take necessary preventive measures for the safe handling of contaminated media. RWEC's Emergency Response Plan is contained in the SSHP, which is included in Appendix B of this plan. The SSHP explains the operations necessary to ensure compliance with federal Occupational Safety and Health Administration (OSHA) and American National Standards Institute (ANSI).

3.5 Decontamination Procedures

Heavy equipment will be decontaminated by dry means (e.g., brushes, shovels) and/or with a power washer and water-soap solution. Solids will be collected and disposed with the waste soil, and liquids will be containerized, characterized, and disposed appropriately. Decontamination equipment and solutions will be treated and/or disposed in accordance with the procedures as established in the Final Steps 3b and 4 Baseline Environmental Risk Assessment (BERA) for SWMUs 1 & 2 (Michael Baker Jr., Inc. (Baker), 2007).

3.5.1 Dry Decontamination

- Using shovels and brooms, remove large dirt clods and debris. If possible, lift and spin tracks to loosen material;
- Collect solids and combine with waste soil.

3.5.2 Wet Pressure-Washing Decontamination

- Wet decontamination will be performed in an area that is covered with plastic sheeting and is bermed to contain all fluids;
- Using a pressure washer, direct-spray all areas that have been exposed to contaminated soils including tires, tracks, and buckets. Make sure all visible dirt is removed;
- Collect and containerize waste solids and liquids. Solids will be combined with waste soil, and liquids will be containerized in 55-gallon drums and staged as described in the Steps 3b and 4 BERA (Baker, 2007);
- To prevent possible contamination from sampling equipment, all sampling devices will be decontaminated and sealed before initiation of sample collection. To the greatest extent possible, sampling equipment will not be field decontaminated. The following procedures will be used to decontaminate field sampling equipment at least 24 hours before sampling:
 - Rinse with potable water. Change the water frequently.
 - Wash with the non-phosphate detergent and water solution. Dilute the non-phosphate detergent as directed by the manufacturer.
 - Rinse with potable water. Change the water frequently.
 - Triple rinse with pesticide-grade (99 percent or better) isopropyl alcohol.
 - If high metals contamination is evident, rinse with nitric acid/deionized water solution. The solution will be made from 10 percent reagent-grade nitric acid and deionized water.
 - Triple rinse with deionized water. Rinsing will be done by applying the deionized (DI) water from a stainless steel Hudson-type sprayer or squeeze bottle made of Nalgene™ or Teflon™ (or equivalent) while holding equipment over a 5-gallon bucket.
 - Allow equipment to air dry at least 24 hours. Then, wrap equipment with aluminum foil and cover with plastic.

Wherever possible, disposable equipment will be used to minimize the amount of decontamination that will be required.

For hand-auger sampling, it is not possible to exclusively use disposable sampling equipment. Rods, flights, and spoons will require field decontamination between sampling locations and between actual samples when more than one sample is to be collected at a given location. Decontamination of reusable sampling equipment that comes in contact with samples will be performed to prevent the introduction of extraneous material into samples, and to prevent cross-contamination between samples.

The following procedures will be used for field decontamination of reusable sampling equipment and personal protective equipment:

- Rinse with potable water. This step will decrease the gross contamination and reduce the frequency at which the non-phosphate detergent and water solution need to be changed. Change the water frequently.
- Wash with the non-phosphate detergent and water solution. This step will remove remaining contamination from the equipment. Dilute the non-phosphate detergent as directed by the manufacturer.
- Rinse with potable water. This step will rinse the detergent solution away from the equipment. Change the water frequently.
- Triple-rinse with DI water. This step will rinse any detergent solution and potable water residues. Rinsing will be done by applying the DI water from a stainless steel Hudson-type sprayer or squeeze bottle made of Nalgene™ or Teflon™ (or equivalent) while holding equipment over a 5-gallon bucket.
- Allow equipment to air dry. Rinsate will be placed in drums or tanks and staged for disposal.

3.6 Permits and Licenses

The Federal agency, in this case the Navy, is responsible for obtaining National Environmental Policy Act (NEPA) permits with the regulatory agencies. It is expected that a DS-1 (Solid Waste Transporter) and an Air Emissions permit will be required. These permits will be requested by RWEC. The basis of the permit request will be the directive from PREQB.

4.0 PROJECT ACTIVITIES

The following subsections describe field activities that will be performed in conjunction with this project. The main components of the construction activities including soil sampling and debris removal are listed in Section 1.3.

4.1 Mobilization and Site Preparation

Heavy equipment will be procured from local suppliers throughout the duration of fieldwork to address the ongoing needs at the site. Site preparation will include verifying utility locations, installing erosion controls, clearing and grubbing (where required), constructing laydown and staging areas, establishing access routes for equipment and transport vehicles, and delineating work areas. Temporary equipment laydown and staging areas will be approved by the Navy Public Works POC.

4.2 Site Surveying

RWEC will use a subcontractor for surveying services as needed. The sampling locations and debris pile locations are provided on Figures 1-3 through 1-5.

4.3 Surface Soil Delineation Sampling

Delineation sampling will be conducted in accordance with procedures established in the Final Step 3b and 4 BERA (Baker, 2007). As indicated in Table 4-1, surface soil samples at SWMU 1 will be taken to a depth of 0-1 ft bgs; at SWMU 2, samples will be taken at 0-1 ft bgs and 1-2 ft bgs (see Table 4-2). Samples will be analyzed for constituents as identified in Table 4-1. Proposed delineation sampling locations for SWMU 1 are shown in Figure 1-3; proposed delineation sampling locations for SWMU 2 are shown on Figure 1-4. QA/QC samples are listed on Table 4-3.

4.4 Surface Debris Removal Procedures

At SWMU 1, debris piles will be removed from areas as depicted in Figure 1-5. The debris removal will be completed with appropriately sized heavy equipment. At a minimum, an excavator will be used during the debris removal activities.

During debris removal, good engineering practices and appropriate measures will be implemented to control both contaminant releases and general exposure to workers. Workers engaged in debris removal and/or handling activities will be required to wear an appropriate level of personal protective equipment (PPE) as described in the SSHP and as determined on site by the SSHO.

RWEC will maintain a clean site by disposing any generated construction debris (CD). CD will be stored within the designated work areas and will be disposed as directed by the NTR. Once project activities are completed, RWEC will restore the site to its original condition to the extent possible. However, RWEC will not restore or replace trees that are damaged or removed for site access or as a result of remediation activities. Surplus materials, rubbish, temporary structures, barricades, and project signs will be removed from the sites.

5.0 ENVIRONMENTAL PROTECTION PLAN

RWEC, as the prime contractor, is responsible for ensuring adherence to this Environmental Protection Plan.

5.1 Protection of Features

RWEC will confine construction activities to areas defined in the plans or to areas specifically assigned for RWEC's use. Storage and related areas and access routes required temporarily by RWEC will be assigned by the NTR. No other areas on government premises will be used by RWEC without written consent of the NTR.

RWEC will not deface, injure, or destroy trees and shrubs, nor remove or cut them without authorization. Ropes and cables will not be fastened or attached to trees for anchorage. Any tree scarred or damaged by RWEC's operations outside of authorized removal areas will be restored as much as possible to its original condition. Some trees and foliage in the immediate work area will be removed to access excavation areas, while those outside of the immediate work area will be left undisturbed. Trees and foliage will be inspected during the final site walkthrough. Appropriate actions will be taken at the direction of the NTR. Trees outside of authorized removal areas that are damaged by RWEC that cannot be saved will be immediately removed, and if directed by the NTR, replaced with a tree of the same species. Trees that are damaged and/or removed as part of clearing for access or remediation activities will not be replaced.

All streams, waterways, and storm drainage systems will be protected from damage and from sedimentation.

5.2 Traffic Plans

RWEC will coordinate with the NTR and/or the Public Works POC to determine an appropriate haul route for equipment/material deliveries and transport of wastes off site. All RWEC personnel and subcontractors will be informed of the approved route and will adhere strictly to the approved route. The Site Superintendent will audit conformance with the approved route on a daily basis.

5.3 Spill Control Plan

RWEC will be responsible for any spills or leaks caused by its operations during the performance of this contract. RWEC will provide contingency measures for potential onsite spills of any potentially hazardous or other regulated materials. RWEC will provide the following:

- Identification of potential spill pathways and receptors;
- Methods, means, and facilities to prevent contamination of soil, water, air, structures, equipment, or material from a release due to RWEC's operations;
- Equipment and personnel to perform emergency measures to mitigate spills and control their migration;
- A decontamination program to minimize potential for contamination of adjacent areas.

The methods employed on this project to prevent and control spills will include using good work practices to avoid unnecessary spillage.

5.3.1 Spill Response

The following requirements will be met for a spill of a hazardous material:

- Take immediate measures to control and contain the spill to prevent releases into sewers to surface water;
- Notify the NTR and the NAPR Public Works POC immediately;
- Notify NAPR Fire Department immediately at 9-1-1;
- If the amount is above a reportable quantity or if any amount enters a waterway or storm sewer, RWEC will notify both The National Response Center Spill Reporting Hotline at 1-800-424-8802 and the Puerto Rico Environmental Quality Board at 787-767-8056 within 2 hours of the spill;
- Isolate and contain hazardous spill areas with absorbent pads, booms and pillows;
- Use spill kits to absorb liquids;
- For larger spills, dispatch vacuum tanker and/or emergency response team;
- Deny entry to unauthorized personnel;
- Do not allow anyone to touch the spilled material;
- Stay upwind and keep out of low areas;
- Keep combustibles away from the spilled material;
- Collect samples for analysis to determine that cleanup is adequate;
- Take other appropriate actions, as needed.

5.3.2 Notification of Spills and Discharges

RWEC will provide verbal and written notification of any spill of hazardous substances as required by the Code of Federal Regulations (CFR), State, local regulations and Navy requirements.

In the event of a spill, the NTR and the NAPR Fire Department will be notified immediately at 9-1-1. If the amount is above a reportable quantity or if any amount enters a waterway or storm sewer, RWEC will notify both The National Response Center Spill Reporting Hotline at 1-800-424-8802 and the Puerto Rico Environmental Quality Board at 787-767-8056 within 2 hours of the spill. RWEC will submit a spill and/or discharge report to the NTR within 2 days of a release. The report will include the following items:

- Description of material spilled including identity, quantity, and a copy of the waste disposal manifest;
- Exact time and location of the spill, and a description of the area involved;
- Containment procedures used;
- Description of cleanup procedures used at the site including disposal of spill residue;
- Summary of RWEC communications with other agencies;

The report will be finalized between RWEC and the Navy within 7 days of the spill, and the Navy will provide the report to the appropriate regulatory authorities.

5.3.3 Spill Response Resources

RWEC will have a representative available on-call 24 hours a day during this project to handle emergencies at the site. Refer to the SSHP for the Emergency Contact List. An established local work force having OSHA 1910.120 training will be used for emergency response. RWEC will have spill kits, absorbent pads, and a decontamination pad on site for the duration of the project.

5.4 Dust Control Plan

Dust may be generated by construction activities during dry weather. If visible dust appears to be generated within the breathing zone of workers or capable of migrating beyond the construction limits at any of the sites, dust control measures will be implemented. The measures may include covering stockpiled soils or spraying water on the soils and worksite. If dust is still not adequately controlled, workers exposed to the dust may be required to upgrade their PPE from Level D to Level C (full-face respirator with the appropriate cartridge) in accordance with the SSHP. The particulate (dust) concentration and action levels will be determined and documented as described in the SSHP, and PPE upgrade will be performed if the particulate action level is exceeded.

5.5 Contaminant Prevention Plan

All activities will be performed in a manner to minimize risk for accidental release to the environment, minimize unsafe worker conditions, and minimize complications and delays to project completion. RWEC will minimize handling contaminated soils. Onsite handling of soils will occur during excavation, loading, and sampling activities.

Exclusion zones will be established within the work areas by the SSHO. All heavy equipment, machinery, vehicles, instrumentation, and personnel will be decontaminated before exiting these zones in an effort to minimize migration of contaminants.

6.0 CONTRACTOR QUALITY CONTROL

The following section outlines the use of operational procedures to ensure CQC from the preparatory stages of project plan reviews to delivery of a final product to the Navy, for the ICM to be performed at SWMUs 1 and 2. This section also covers actual procedure selection, control, monitoring, change, and construction activities outlined in the project SOW.

6.1 QC Coordination

The PM will effectively communicate the content and intentions of the contract documents to all members of the project team to ensure consistency of project understanding and planned implementation. Coordination will be based upon the concept of the three-phase QC inspection process (preparatory, initial, and follow-up). Scheduled coordination activities will be detailed on the project's field schedule to integrate the QC process into all aspects of the project. RWEC will provide notification to the NTR and/or the NAPR Public Works POC for coordination of meetings, inspections, testing, and start-up activities at the job site. RWEC will provide required engineering and other support services throughout the construction process, accurate test results, and field reports.

6.2 Meetings

6.2.1 Preconstruction Quality Management Coordination Meeting

Before the start of construction, a preconstruction quality management coordination meeting will be held. During this meeting between RWEC's staff and the appropriate Navy personnel, a mutual understanding of the QC System details (on-site and off-site) will be established, including procedures and documentation for CQC operations, control activities, and testing.

Relevant QC topics discussed in this meeting will include, but are not limited to, the following:

- QC documentation and each organization's role relative to design criteria, plans, and specifications and the QC process;
- QC staff, responsibilities, authorities, and communication procedures Methods for modifying the CQC Plan;
- DFWs;
- Three-phase control system;
- Procedures for observation, testing, and sampling;
- Procedures for nonconformance identification, documentation, and resolution data quality control reports (DQCRs);
- Document control;
- Construction schedule.

This meeting will be conducted by the NTR or the NAPR Public Works Department and attended by the PM and QC Officer and other team members including, but not limited to, the Site Superintendent, the QCSM (or designated representative), the SHM, and the SSHO, as required.

Minutes of these meetings will be recorded by the project QC Officer and distributed to all participants. From that point on, the CQC Plan will be used to inspect and document the delivery of a quality product and service. Ongoing QC meetings, coordination of construction activities, and maintaining accurate field records will be the means used to maintain effective follow-up QC. All appropriate members of the project team, including subcontractors, will be required to participate.

6.2.2 Progress Meetings

Progress meetings will be scheduled weekly or as established by the NTR and, whenever necessary, to address significant questions, establish new guidelines, introduce a new aspect to the project, or to address issues that affect the progress of the work. The Site Superintendent and other appropriate RWEC staff such as the QC Officer and SSHO will attend these meetings and record and distribute the meeting minutes. Topics that typically will be addressed at the progress meetings include:

- Review and approval of minutes of previous meeting ;
- Review of safety and health requirements and procedures;
- Review of QC requirements and procedures;
- Review of work progress;
- Field observations, problems, and conflicts;
- Problems that may impede the schedule, and proposed corrective actions;
- Revisions to project schedule;
- Coordination of scheduled activities;
- Review of submittal schedules;
- Pending changes and substitutions;
- Review proposed changes for effect on construction and on completion date, and effect on other contracts of the project.

6.2.3 Daily Safety and Coordination Meetings

The Site Superintendent and the SSHO will assess each work area for potential hazards before beginning work in that area and will hold daily safety meetings with all site personnel at the beginning of every work shift. These daily safety meetings will be brief and meaningful. A daily tailgate safety meeting record will be used to document the meeting. A serious discussion will occur on the following issues as they pertain to each day's work:

- Review of the activity hazard analyses (AHAs) for specific tasks to be conducted on that day;

- Work planned for the current day and any coordination required to maintain a no-delay schedule;
-
- Safety hazards associated with specific feature of work;
- Tools and equipment to be used, and special safety and maintenance procedures/requirements to be used with the equipment;
- Prework inspections to be performed;
- Emergency plan including brief review of emergency hospital route;
- End-of-day work area condition including cleanup, placement of equipment and materials, and preparation for next day.

6.3 Selection, Approval and Monitoring

The NTR, PM, Site Superintendent, and QCSM will approve all detailed QC procedures incorporated into the CQC Plan. The same parties will approve subsequent changes following initiation of work. QC monitoring, observation, and surveillance systems will be coordinated with key construction steps under each DFW, testing, and three-phase QC inspection point.

The QC Officer will keep a daily logbook to document observations of construction activities and will report on the status of ongoing testing and analytical results and any other data relevant to the QC effort. The daily logbook will be used to support the Data Quality Control Report (DQCR) and will be archived as part of project records. The QC Officer will closely monitor the actual field testing, verifying proper procedure technique, sample handling, and chain of custody, if required. The QC Officer will report the results of testing to provide timely authorization to proceed with work sequence or initiate nonconformance action.

6.4 Change and Control Procedures

RWEC will identify, document, and track the status of changes in project activities. A Field Variance Report (FVR) will document changes in procedures or conditions that are inconsistent with the stated SOW and could have a cost impact on the project. Proposed changes that have not physically occurred will also be documented on a FVR. In instances where the physical work has been completed, the FVR will be used to provide the as-built information and allow the opportunity to review the impact of those potential changes on other components of the work. A copy of an FVR is included in Appendix C.

The Site Superintendent and the QC Officer, as required, will prepare the FVR and submit it to the PM for review. The PM will discuss potential changes with the NTR and RWEC's technical staff. Before routing the FVR, the Site Superintendent will assign an FVR number using the document control system, retain a copy for the FVR log and contract files, and then forward a copy of the FVR to the PM. The QCSM will monitor the documentation and provide support. The responsible engineer, Site Superintendent, and PM will review the change request. Upon resolution, each will sign the FVR and forward the FVR to the NTR for review and processing.

6.5 Construction Activities and Definable Features of Work

This section identifies the construction activities as DFWs that will require QC monitoring, testing, and observation. A DFW is an activity that is separate and distinct from other activities

and that requires separate QC activities. In general, each discipline or work item is considered a DFW. Activities within a discipline or work item can be considered a DFW if separate and distinct control requirements exist. QC is accomplished for each of these DFWs using the U.S. Army Corps of Engineers (COE) three-phase process.

6.5.1 Project Planning and Submittals

Anticipated submittals for approval include a draft and final work plan, including a SSHP; draft and final versions of the Construction Completion Report. Submittals that RWEC expects from its subcontractors include laboratory analytical results and QA/QC documentation; qualifications from the surveyor; and completed shipping manifests and bills of lading.

6.5.2 Mobilization

Mobilization is the actual movement of personnel and equipment onto the site to establish a presence for project implementation and will include the following activities:

- Mobilize equipment and personnel;
- Locate and establish equipment and material staging areas.

Mobilization will be executed upon approval by the Navy.

6.5.3 Site Preparation

RWEC will perform the following site preparation activities:

- Establish support area;
- Establish initial site controls and zones;
- Establish/construct staging areas;
- Identify, protect and relocate utilities, if necessary;
- Construct necessary erosion controls;
- Clear vegetation and establish access routes;
- Establish vehicle entrance/exit pads;
- Construct decontamination pad;
- Site surveying and layout of debris removal areas and surface soil sample delineation areas.

RWEC will supervise the surveying and layout of debris piles to be removed from SWMU 1. During use of temporary laydown areas and staging areas, RWEC will maintain the areas in an orderly manner and the sites will be returned to the government in their condition prior to occupation. Baseline conditions of each area will be documented by photographic record.

6.5.4 Equipment Decontamination

Heavy equipment will be decontaminated by dry means (e.g., brushes, shovels) and/or with a power washer and water-soap solution. The rinsate and solids will be collected and disposed of appropriately. Decontamination equipment and solutions will be treated and/or disposed of in accordance with applicable regulations and requirements.

Field equipment, such as probes, tools, etc., will be decontaminated with dry methods or with a solution of biodegradable detergent and water and rinsed with tap water from the base water supply. Distilled water will be used to rinse reusable sampling equipment such as trowels, scoops, and bailers. Rinsate will be placed in drums or tanks and staged for disposal.

6.5.5 Demobilization

Once site restoration activities are complete, RWEC will:

- Clean all affected areas of the site;
- Remove support facilities, temporary stormwater and erosion-control measures, temporary construction roads, and decontamination facilities;
- Prepare and submit final documentation of completed work and project areas;
- Notify all applicable parties that the remediation activities are complete.

The Navy and RWEC will then perform a final inspection of the areas to ensure compliance with this Work Plan and the contract documents.

6.6 Inspections

To ensure that all construction activities comply with the requirements of the contract, RWEC's QC Officer or another designated member of the QC Team will perform QC inspections. The types of QC inspections will include preparatory, initial, follow-up, and completion inspections for all DFWs. For each preparatory and initial inspection, the QC Officer will develop a narrative description that presents the detailed QC procedures to be used. This documentation will be finalized and approved at the QC meeting held for each distinct inspection and will become part of the minutes to the meeting that are attached to the DQCR. The QC inspection will be scheduled and conducted by the QC Officer or another designated member of the QC Team. The QC Officer or another designated member of the QC Team will document all QC meetings with meeting minutes. The format for documenting preparatory and initial inspections is included in Appendix C. Compliance with all QC requirements is accomplished by using this three-phase process for all DFWs.

6.6.1 Preparatory Phase

The QC Officer or another designated member of the QC Team will review construction drawings, submittal status, material requirements and onsite availability, worker qualifications, and equipment requirements before beginning work on each DFW. This review will be performed with all subcontractors involved in the DFW. During this phase, qualified staff will be assigned, testing controls prepared, and safety concerns addressed. This phase will include:

- Review of the particular activity in the Work Plan;
- Verification that all required submittals have been completed and approved;
- Review to ensure that all materials and equipment have been delivered, tested, and approved;
- Review of provisions to provide required inspection and testing;
- Examination of the work area to ensure that all required preliminary work has been completed and is in compliance with the contract;
- Physical examination of required materials and equipment to ensure that they are on hand, conform to approved plans, drawings, or other submitted data, and are properly stored;
- Review the appropriate Health and Safety Plan to ensure safety requirements are met;
- Discussion on procedures for controlling quality of the work including repetitive deficiencies;
- A check to ensure that the plan for the work to be performed has been accepted by the NTR;
- Discussion of the initial control phase;

RWEC will notify the NTR at least 48 hours in advance of beginning the preparatory phase. This phase will also include a meeting conducted by the QC Officer or another designated member of the QC Team and attended by the Site Superintendent and other appropriate staff responsible for the DFW. The results of the preparatory phase actions will be documented by separate minutes prepared by the QC Officer or another designated member of the QC Team and attached to the DQCR. The QC Officer or another designated member of the QC Team will also instruct applicable subcontractor staff as to the acceptable level of workmanship required to meet contract specifications and familiarize all workers with the safety precautions developed in the Health and Safety Plan.

6.6.2 Initial Phase

This phase of inspection must be accomplished at the beginning of physical work on a DFW. The Initial Phase will verify that control for the work developed in the "Preparatory Meeting" is implemented and work is performed to the level of workmanship mutually agreed upon. RWEC will ensure that subcontractor and RWEC workers understand, through immediate inspection, the contract standards, and the standards of workmanship desired. If there is a difference of opinion in the interpretation of contract requirements, the issue will be settled at this time. The initial inspection phase is a practical method of performing preventive inspection and resolving conflicts. The following will be accomplished during this phase:

- A check of work to ensure that it is in full compliance with the contract requirements. Minutes of the preparatory meeting will be reviewed

- Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing
- Establish level of workmanship and verify that it meets the desired acceptable workmanship standards
- Resolve all differences
- Check safety to include compliance with and upgrading (if necessary) of the safety plan. Review the safety plan with each worker

The initial phase will be repeated for each new crew working on site any time after an extended work stoppage (greater than a week) or any time acceptable specified quality standards are not being met.

6.6.3 Follow-Up Phase

Follow-up inspection and testing will be geared to a level of effort sufficient to verify the continuation of contract compliance and standards of workmanship established during the previous two phases. Daily checks will be made a matter of record in the CQC documentation for each DFW. Final follow-up checks will be conducted, and all deficiencies will be corrected before the start of additional DFWs that may be affected by any deficient work.

6.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phase inspections will be conducted of the same DFWs if the quality of ongoing work is unacceptable, if there are changes in the CQC staff or work crew, if work on a DFW is resumed after a substantial period of inactivity, or if other problems develop.

6.6.5 Completion Phase

At the completion of the DFW, the QC Officer or another designated member of the QC Team will conduct a completion inspection to verify that all work items are complete and in conformance with the project plans and specifications.

Prefinal Inspection. Upon completion of work, the QC Officer will inspect the work and develop a "punch list" of items that do not conform to the approved drawings and Work Plan. Such a list of deficiencies will be included in the CQC documentation and will include the estimated date by which the deficiencies will be corrected. These inspections and any deficiency corrections required following prefinal and final inspections will be accomplished within the time slated for completion of the project.

Final Acceptance Inspection. RWEC's QCSM or other designated member of the QC Team, representatives from applicable subcontractors, and the NTR will be in attendance at this inspection. The NTR will formally schedule the final acceptance inspection. Notice will be given to the NTR at least 14 days before the planned final acceptance inspection date.

6.7 Nonconformance and Corrective Action

All identified nonconforming construction methods, procedures, and materials will be corrected through systematic actions. Any time a condition exists that does not comply with the project

plans, applicable codes, workmanship standards, or Navy requirements, the nonconformity will be resolved. The QC Officer will take the following actions:

- If at any time materials or workmanship are observed that do not comply with project plans, codes, or acceptable construction practices, the QC Officer will notify the RWEC Site Superintendent and subcontractor (if appropriate) to initiate prompt corrective action
- The discrepancies, if they cannot be verbally communicated and corrected immediately, will be documented on a Nonconformance Report (NCR) form (see Appendix C). A detailed description will be given of the item or condition that has failed to meet the project plan or other requirements with an explanation of conditions at the time of failure and its probable cause
- The QC Officer, subcontractor, and Site Superintendent will evaluate discrepancies, coordinate the problem resolution, and determine methods of correction that will prevent recurrence of the problem
- When corrective action is complete, the item will again undergo a final inspection
- The QC Officer will note on the Final Acceptance Report any retest required and performed, nondestructive examination (NDE) required and performed, or changes in identification of any replacement parts used in correcting the problem
- A distribution list for discrepancy reports will be determined at the initial project planning meeting. At a minimum, distribution will include the NTR, PM, Site Superintendent, and QCSM.

6.8 Documentation

QC records are the primary means of documenting and reporting construction quality and conformance with contract documents. This section outlines the general procedures that will be followed for the identification, use, handling, filing, storage, and disposition of QC records.

6.8.1 Responsibility

The QC Officer will verify that required records are prepared as work is performed to provide documented evidence of the quality of items, services, and activities. Records will be consistent with applicable codes, work plans, and contracts, and will be adequate for use in management of the project. Inspection and test records will identify the inspector or data recorder, the type of observation, the results, and the acceptability or action taken in connection with any deficiency.

6.8.2 Requirements

Individual inspections, tests, and observations will be scheduled at predetermined points in the project. The proper documentation to record these activities will be compiled by the QC Officer or another designated QC Team member and discussed with the testing personnel before execution. The QC Officer or another designated QC Team member will monitor the inspection process and document progress and observations in the QC logbook. This information will be summarized in the DQCRs provided to the COR, Site Superintendent, and QCSM.

Reports and Records. The QC Officer will maintain current records providing factual evidence that required QC activities and/or tests have been performed. These records will also address the work of subcontractors and suppliers and will be on an acceptable form that includes, at a minimum, the following information:

- Contractor/subcontractor and their area of responsibility;
- Description of equipment used and number of hours used, idle, or repaired;
- Work performed, including a description and a sketch, if necessary;
- Test and/or control activities performed with results and references to Work Plan requirements. The control phase will be identified (preparatory, initial, or follow up). Any deficiencies will be noted along with corrective actions;
- Quantity of materials received at the site with statement as to acceptability and storage;
- Submittals reviewed and action taken;
- Offsite surveillance activities and actions taken;
- Job safety evaluations stating what was checked, instruction, corrective actions, and results;
- Contractor's statement verifying compliance with contract documents.

These records will cover both conforming and deficient features and will include a statement that the equipment and materials incorporated in the work as well as the workmanship comply with the contract requirements. The reports will be signed and dated by the QC Officer. The report from the QC Officer will include copies of test reports and copies of reports prepared by all QC personnel.

Forms. Construction QC forms will be used for visual observations, inspections, and testing. The QC Officer or another designated QC Team member will witness all required field testing and sign the appropriate forms for the work to be accepted. Inspection and testing forms will identify the equipment, materials, and installations involved, and checklists will be marked where applicable. Locations, orientations, elevations, test parameters, test results, and other comments will be included on the forms as appropriate. Forms will be dated and signed by the person performing the observation, inspection, or test. Forms will also be signed and dated by the QC Officer and submitted to the Site Superintendent for approval.

The QC Officer will document all QC activity on the appropriate forms. Appendix C contains the formats for the DQCR, FVR, List of Outstanding Deficiencies, NCR, Submittal Register and Transmittal Forms, CQC Test Report List, Record of Preparatory and Initial Inspections, Preparatory Inspection Outline, Initial and Follow-up Phase Checklist, and Field Inspection Report. Additional forms may be used as necessary and as approved by the QCSM.

Control. A standard records management and document control system will be used. The PM will be responsible for implementing the system for the entire project and the Site Superintendent will be responsible for implementing these practices in the field. Elements of the records management system include:

- Master index system
- Logging and issuing of document numbers
- Method to determine status of documents in progress
- Standardized procedures/forms
- Proper storage of documents
- Retrieval
- Archiving.

Elements of the document control system include:

- Logging and issuing of control numbers
- Assignment of a central control person
- Controlled access.

Project records will be maintained in a safe and retrievable manner until project closeout. Physical and electromagnetic protection will be provided until records are delivered to the client or archived. Archived records will be protected from loss or damage for 5 years or as specified by the government.

7.0 DOCUMENTATION AND REPORTING

7.1 Construction Completion Report

Following the completion of all construction work, RWEC will prepare a construction completion report. This completion report will address site-specific information including the following:

- A cover letter signed by the PGM certifying that all services were performed according to the project requirements
- A synopsis/written narrative report describing site activities including quantities of materials removed, sample collection data, and certification that the work was completed in accordance with the Work Plan.
- Explanation and description of any modifications to the Work Plan or any other plans and why the modifications were necessary
- Information demonstrating that the approval plans were implemented and the cleanup criteria have been met
- Summary of significant activities that occurred during construction, including problems that were encountered and how they were addressed
- Copies of all analyses performed including QC data and sample validation
- Information on who transported and accepted all wastes encountered and copies of manifests, as applicable
- Summary of total project costs
- Preconstruction, progress and post-construction photographs

7.2 Weekly Progress Meetings

While field activities are in progress, RWEC will participate in weekly progress meetings with the NTR and the NAPR Public Works POC. The standard agenda will include the following:

- A description and status of the project and cost report;
- Summaries of all findings and description of significant activities and work completed or accomplished;
- Summaries of all changes made during the reporting period (e.g., personnel, documentation, construction);
- Summaries of all problems encountered or anticipated problems prevented during the reporting period;
- Actions taken to rectify/prevent problems;
- Problems resolved;

- Changes to key project personnel;
- Projected work for the next reporting period;
- Deliverables submitted;
- Schedule updates.

7.3 Daily Quality Control Reports

A DQCR will be completed daily during field activities to document all project activities. The report will cover both conforming and nonconforming work and materials and, where applicable, will include a statement of certification that all materials, supplies, and work accepted that day comply with the contract requirements. The QC Officer or authorized designee will sign the DQCR to validate the certification. The DQCR will include, but not be limited to the following:

- Type and number of control activities;
- Results of inspections and tests;
- Types of defects/causes for rejection, if any;
- Corrective actions proposed/taken, if any;
- Number of personnel working on project by trade;
- Types and quantities of equipment on site;
- Types and quantities of materials delivered to site;
- Weather conditions/long-term forecast;
- Delays and their causes, if any;
- Verbal instructions;
- Samples collected;
- Waste transportation and disposal summary;
- Visitors to the site such as regulators, politicians, reporters, etc.;
- Health and safety activities;
- Daily and cumulative safety hours;

8.0 PROJECT SCHEDULE

Appendix D presents the proposed schedule for completion of the ICM. Before mobilization, the construction schedule will be reviewed with the appropriate Navy personnel and to identify any access limitations. Work will be scheduled to minimize delays and to determine if additional funding is needed to complete the project.

The schedule includes review of plans by USEPA, Puerto Rico EQB, and Navy personnel; sampling and analysis; procurement of necessary equipment and materials; completion of all corrective measures activities; and the preparation of final reports.

9.0 REFERENCES

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TABLES

TABLE 4-1
SWMU 1 PRE-EXCAVATION DELINEATION SAMPLING MATRIX
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
1SD02	Surface Soil	1SD02 A	0-1	X	X
		1SD02 B	0-1	X	X
		1SD02 C	0-1	X	X
		1SD02 D	0-1	X	X
		1SD02 D-D	0-1	X	X
		1SD02 E	0-1	X	X
		1SD02 F	0-1	X	X
		1SD02 G	0-1	X	X
		1SD02 H	0-1	X	X
		1SD02 K	0-1	X	X
		1SD02 L	0-1	X	X
		1SD02 M	0-1	X	X
		1SD02 N	0-1	X	X
		1SD02 O	0-1	X	X
		1SD02 P	0-1	X	X
1SD02 P-D	0-1	X	X		
1SD02 P-MS/MSD	0-1	X	X		
1SS06	Surface Soil	1SS06 A	0-1	X	X
		1SS06 B	0-1	X	X
		1SS06 C	0-1	X	X
		1SS06 D	0-1	X	X
		1SS06 E	0-1	X	X
		1SS06 F	0-1	X	X
		1SS06 G	0-1	X	X
		1SS06 H	0-1	X	X
		1SS06 I	0-1	X	X
		1SS06 J	0-1	X	X
		1SS06 J-D	0-1	X	X
		1SS06 J-MS/MSD	0-1	X	X
		1SS06 K	0-1	X	X
		1SS06 L	0-1	X	X
		1SS06 M	0-1	X	X
1SS06 N	0-1	X	X		
1SS06 O	0-1	X	X		
1SS06 P	0-1	X	X		

TABLE 4-1
SWMU 1 PRE-EXCAVATION DELINEATION SAMPLING MATRIX
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
1SS07	Surface Soil	1SS07 A	0-1	X	X
		1SS07 B	0-1	X	X
		1SS07 C	0-1	X	X
		1SS07 D	0-1	X	X
		1SS07 E	0-1	X	X
		1SS07 F	0-1	X	X
		1SS07 G	0-1	X	X
		1SS07 H	0-1	X	X
		1SS07 H-D	0-1	X	X
		1SS07 I	0-1	X	X
		1SS07 J	0-1	X	X
		1SS07 K	0-1	X	X
		1SS07 L	0-1	X	X
		1SS07 M	0-1	X	X
		1SS07 N	0-1	X	X
		1SS07 O	0-1	X	X
1SS07 P	0-1	X	X		
1SS09	Surface Soil	1SS09 A	0-1	X	X
		1SS09 B	0-1	X	X
		1SS09 C	0-1	X	X
		1SS09 D	0-1	X	X
		1SS09 E	0-1	X	X
		1SS09 F	0-1	X	X
		1SS09 G	0-1	X	X
		1SS09 H	0-1	X	X
		1SS09 I	0-1	X	X
		1SS09 J	0-1	X	X
		1SS09 J-D	0-1	X	X
		1SS09 K	0-1	X	X
		1SS09 L	0-1	X	X
		1SS09 M	0-1	X	X
		1SS09 N	0-1	X	X
		1SS09 O	0-1	X	X
1SS09 P	0-1	X	X		

TABLE 4-1
SWMU 1 PRE-EXCAVATION DELINEATION SAMPLING MATRIX
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
1SS10	Surface Soil	1SS10 A	0-1	X	X
		1SS10 B	0-1	X	X
		1SS10 B-D	0-1	X	X
		1SS10 B-MS/MSD	0-1	X	X
		1SS10 C	0-1	X	X
		1SS10 D	0-1	X	X
		1SS10 E	0-1	X	X
		1SS10 F	0-1	X	X
		1SS10 G	0-1	X	X
		1SS10 H	0-1	X	X
		1SS10 I	0-1	X	X
		1SS10 J	0-1	X	X
		1SS10 K	0-1	X	X
		1SS10 L	0-1	X	X
		1SS10 L-D	0-1	X	X
		1SS10 M	0-1	X	X
		1SS10 N	0-1	X	X
1SS10 O	0-1	X	X		
1SS10 P	0-1	X	X		
1SS11	Surface Soil	1SS11 A	0-1	X	X
		1SS11 B	0-1	X	X
		1SS11 C	0-1	X	X
		1SS11 D	0-1	X	X
		1SS11 E	0-1	X	X
		1SS11 F	0-1	X	X
		1SS11 F-D	0-1	X	X
		1SS11 F-MS/MSD	0-1	X	X
		1SS11 G	0-1	X	X
		1SS11 H	0-1	X	X
		1SS11 I	0-1	X	X
		1SS11 J	0-1	X	X
		1SS11 K	0-1	X	X
		1SS11 L	0-1	X	X
		1SS11 M	0-1	X	X
		1SS11 N	0-1	X	X
		1SS11 O	0-1	X	X
1SS11 P	0-1	X	X		
1SS11 P-D	0-1	X	X		

TABLE 4-1
SWMU 1 PRE-EXCAVATION DELINEATION SAMPLING MATRIX
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
1SS13	Surface Soil	1SS13 A	0-1	X	X
		1SS13 B	0-1	X	X
		1SS13 C	0-1	X	X
		1SS13 D	0-1	X	X
		1SS13 D-D	0-1	X	X
		1SS13 E	0-1	X	X
		1SS13 F	0-1	X	X
		1SS13 G	0-1	X	X
		1SS13 H	0-1	X	X
		1SS13 I	0-1	X	X
		1SS13 J	0-1	X	X
		1SS13 K	0-1	X	X
		1SS13 L	0-1	X	X
		1SS13 M	0-1	X	X
		1SS13 N	0-1	X	X
		1SS13 N-D	0-1	X	X
1SS13 N-MS/MSD	0-1	X	X		
1SS13 O	0-1	X	X		
1SS13 P	0-1	X	X		
1SS16	Surface Soil	1SS16 A	0-1	X	X
		1SS16 B	0-1	X	X
		1SS16 C	0-1	X	X
		1SS16 D	0-1	X	X
		1SS16 E	0-1	X	X
		1SS16 F	0-1	X	X
		1SS16 G	0-1	X	X
		1SS16 G-D	0-1	X	X
		1SS16 G-MS/MSD	0-1	X	X
		1SS16 H	0-1	X	X
		1SS16 I	0-1	X	X
		1SS16 J	0-1	X	X
		1SS16 K	0-1	X	X
		1SS16 L	0-1	X	X
		1SS16 M	0-1	X	X
		1SS16 N	0-1	X	X
1SS16 O	0-1	X	X		
1SS16 P	0-1	X	X		

Notes:

- Cd = Cadmium
- Cu = Copper
- Pb = Lead
- Hg = Mercury
- Sb = Antimony
- Sn = Tin
- Zn = Zinc
- ft bgs = feet below ground surface

TABLE 4-2
SWMU 2 PRE-EXCAVATION DELINEATION SAMPLING MATRIX
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
2SS02	Surface Soil	2SS02 A	0-1	X	X
		2SS02 D	0-1	X	X
		2SS02 D-D	0-1	X	X
		2SS02 D-MS/MSD	0-1	X	X
		2SS02 E	0-1	X	X
		2SS02 F	0-1	X	X
		2SS02 G	0-1	X	X
		2SS02 H	0-1	X	X
		2SS02 I	0-1	X	X
		2SS02 J	0-1	X	X
		2SS02 K	0-1	X	X
		2SS02 L	0-1	X	X
		2SS02 M	0-1	X	X
		2SS02 N	0-1	X	X
		2SS02 O	0-1	X	X
		2SS02 P	0-1	X	X
2SS02 P-D	0-1	X	X		
2SS02 P-MS/MSD	0-1	X	X		
2SS03	Surface Soil	2SS03 A-00	0-1	X	X
		2SS03 B-00	0-1	X	X
		2SS03 C-00	0-1	X	X
		2SS03 D-00	0-1	X	X
		2SS03 E-00	0-1	X	X
		2SS03 F-00	0-1	X	X
		2SS03 G-00	0-1	X	X
		2SS03 H-00	0-1	X	X
		2SS03 H-00D	0-1	X	X
		2SS03 H-00MS/MSD	0-1	X	X
		2SS03 I-00	0-1	X	X
		2SS03 J-00	0-1	X	X
		2SS03 K-00	0-1	X	X
		2SS03 L-00	0-1	X	X
		2SS03 M-00	0-1	X	X
		2SS03 N-00	0-1	X	X
2SS03 O-00	0-1	X	X		
2SS03 P-00	0-1	X	X		

TABLE 4-2
SWMU 2 PRE-EXCAVATION DELINEATION SAMPLING MATRIX
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
2SS03	Subsurface Soil	2SS03 A-01	1-2	X	X
		2SS03 B-01	1-2	X	X
		2SS03 C-01	1-2	X	X
		2SS03 C-01D	1-2	X	X
		2SS03 D-01	1-2	X	X
		2SS03 E-01	1-2	X	X
		2SS03 F-01	1-2	X	X
		2SS03 G-01	1-2	X	X
		2SS03 H-01	1-2	X	X
		2SS03 I-01	1-2	X	X
		2SS03 J-01	1-2	X	X
		2SS03 K-01	1-2	X	X
		2SS03 L-01	1-2	X	X
		2SS03 M-01	1-2	X	X
		2SS03 N-01	1-2	X	X
		2SS03 N-01D	1-2	X	X
		2SS03 N-01MS/MSD	1-2	X	X
2SS03 O-01	1-2	X	X		
2SS03 P-01	1-2	X	X		
2SS05	Surface Soil	2SS05 A-00	0-1	X	X
		2SS05 B-00	0-1	X	X
		2SS05 C-00	0-1	X	X
		2SS05 D-00	0-1	X	X
		2SS05 E-00	0-1	X	X
		2SS05 F-00	0-1	X	X
		2SS05 G-00	0-1	X	X
		2SS05 H-00	0-1	X	X
		2SS05 H-00D	0-1	X	X
		2SS05 I-00	0-1	X	X
		2SS05 J-00	0-1	X	X
		2SS05 K-00	0-1	X	X
		2SS05 L-00	0-1	X	X
		2SS05 M-00	0-1	X	X
		2SS05 N-00	0-1	X	X
2SS05 O-00	0-1	X	X		
2SS05 P-00	0-1	X	X		

TABLE 4-2
SWMU 2 PRE-EXCAVATION DELINEATION SAMPLING MATRIX
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
2SS05	Subsurface Soil	2SS05 A-01	1-2	X	X
		2SS05 B-01	1-2	X	X
		2SS05 C-01	1-2	X	X
		2SS05 D-01	1-2	X	X
		2SS05 D-01D	1-2	X	X
		2SS05 D-01MS/MSD	1-2	X	X
		2SS05 E-01	1-2	X	X
		2SS05 F-01	1-2	X	X
		2SS05 G-01	1-2	X	X
		2SS05 H-01	1-2	X	X
		2SS05 I-01	1-2	X	X
		2SS05 J-01	1-2	X	X
		2SS05 K-01	1-2	X	X
		2SS05 L-01	1-2	X	X
		2SS05 M-01	1-2	X	X
		2SS05 N-01	1-2	X	X
		2SS05 N-01D	1-2	X	X
2SS05 O-01	1-2	X	X		
2SS05 P-01	1-2	X	X		
2SS10	Surface Soil	2SS10 A	0-1	X	X
		2SS10 B	0-1	X	X
		2SS10 C	0-1	X	X
		2SS10 D	0-1	X	X
		2SS10 E	0-1	X	X
		2SS10 F	0-1	X	X
		2SS10 G	0-1	X	X
		2SS10 H	0-1	X	X
		2SS10 I	0-1	X	X
		2SS10 J	0-1	X	X
		2SS10 J-D	0-1	X	X
		2SS10 J-MS/MSD	0-1	X	X
		2SS10 K	0-1	X	X
		2SS10 L	0-1	X	X
		2SS10 M	0-1	X	X
		2SS10 N	0-1	X	X
		2SS10 O	0-1	X	X
2SS10 P	0-1	X	X		

TABLE 4-2
SWMU 2 PRE-EXCAVATION DELINEATION SAMPLING MATRIX
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
2SS11	Surface Soil	2SS11 A	0-1	X	X
		2SS11 B	0-1	X	X
		2SS11 C	0-1	X	X
		2SS11 D	0-1	X	X
		2SS11 D-D	0-1	X	X
		2SS11 E	0-1	X	X
		2SS11 F	0-1	X	X
		2SS11 G	0-1	X	X
		2SS11 H	0-1	X	X
		2SS11 I	0-1	X	X
		2SS11 J	0-1	X	X
		2SS11 K	0-1	X	X
		2SS11 L	0-1	X	X
		2SS11 M	0-1	X	X
		2SS11 N	0-1	X	X
		2SS11 N-D	0-1	X	X
		2SS11 N-MS/MSD	0-1	X	X
2SS11 O	0-1	X	X		
2SS11 P	0-1	X	X		
2SS14	Surface Soil	2SS14 A	0-1	X	X
		2SS14 B	0-1	X	X
		2SS14 C	0-1	X	X
		2SS14 D	0-1	X	X
		2SS14 E	0-1	X	X
		2SS14 F	0-1	X	X
		2SS14 G	0-1	X	X
		2SS14 H	0-1	X	X
		2SS14 H-D	0-1	X	X
		2SS14 I	0-1	X	X
		2SS14 J	0-1	X	X
		2SS14 K	0-1	X	X
		2SS14 L	0-1	X	X
		2SS14 M	0-1	X	X
		2SS14 N	0-1	X	X
		2SS14 O	0-1	X	X
2SS14 P	0-1	X	X		

TABLE 4-2
SWMU 2 PRE-EXCAVATION DELINEATION SAMPLING MATRIX
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
06SS101	Surface Soil	06SS101 A-00	0-1	X	X
		06SS101 B-00	0-1	X	X
		06SS101 C-00	0-1	X	X
		06SS101 D-00	0-1	X	X
		06SS101 E-00	0-1	X	X
		06SS101 F-00	0-1	X	X
		06SS101 G-00	0-1	X	X
		06SS101 H-00	0-1	X	X
		06SS101 I-00	0-1	X	X
		06SS101 J-00	0-1	X	X
		06SS101 J-00D	0-1	X	X
		06SS101 K-00	0-1	X	X
		06SS101 L-00	0-1	X	X
		06SS101 M-00	0-1	X	X
		06SS101 N-00	0-1	X	X
		06SS101 O-00	0-1	X	X
		06SS101 P-00	0-1	X	X
		Subsurface Soil	06SS101 A-01	1-2	X
	06SS101 B-01		1-2	X	X
	06SS101 C-01		1-2	X	X
	06SS101 D-01		1-2	X	X
	06SS101 D-01D		1-2	X	X
	06SS101 D-01MS/MSD		1-2	X	X
	06SS101 E-01		1-2	X	X
	06SS101 F-01		1-2	X	X
	06SS101 G-01		1-2	X	X
	06SS101 H-01		1-2	X	X
	06SS101 I-01		1-2	X	X
	06SS101 J-01		1-2	X	X
	06SS101 K-01		1-2	X	X
	06SS101 L-01		1-2	X	X
	06SS101 M-01		1-2	X	X
	06SS101 N-01		1-2	X	X
	06SS101 N-01D	1-2	X	X	
06SS101 O-01	1-2	X	X		
06SS101 P-01	1-2	X	X		

Notes:

- Cd = Cadmium
- Cu = Copper
- Pb = Lead
- Hg = Mercury
- Sb = Antimony
- Sn = Tin
- Zn = Zinc
- ft bgs = feet below ground surface

TABLE 4-3
PRE-EXCAVATION DELINEATION QA/QC SAMPLES
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 AND 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Historical Sample Location Identification	Sample Media/ Type	Sample Identification	Sample Depth (ft bgs)	Analyses Requested	
				Sb, Cd, Cu, Pb, Sn, Hg, and Zn	DDD, DDE, and DDT
NA	Equipment Rinsate Blanks ⁽¹⁾	1ER01	NA	X	X
		1ER02	NA	X	X
		2ER01	NA	X	X
		2ER02	NA	X	X
		2ER03	NA	X	X
		2ER04	NA	X	X
		2ER05	NA	X	X
NA	Field Blanks	FB01	NA	X	X
		FB02	NA	X	X
		FB03	NA	X	X

Notes:

Cd = Cadmium

Cu = Copper

Pb = Lead

Hg = Mercury

Sb = Antimony

Sn = Tin

Zn = Zinc

NA = Not Applicable

ft bgs = feet below ground surface

⁽¹⁾ The equipment rinsate blanks will be collected by passing laboratory-grade deionized water through clean unused equipment.

FIGURES

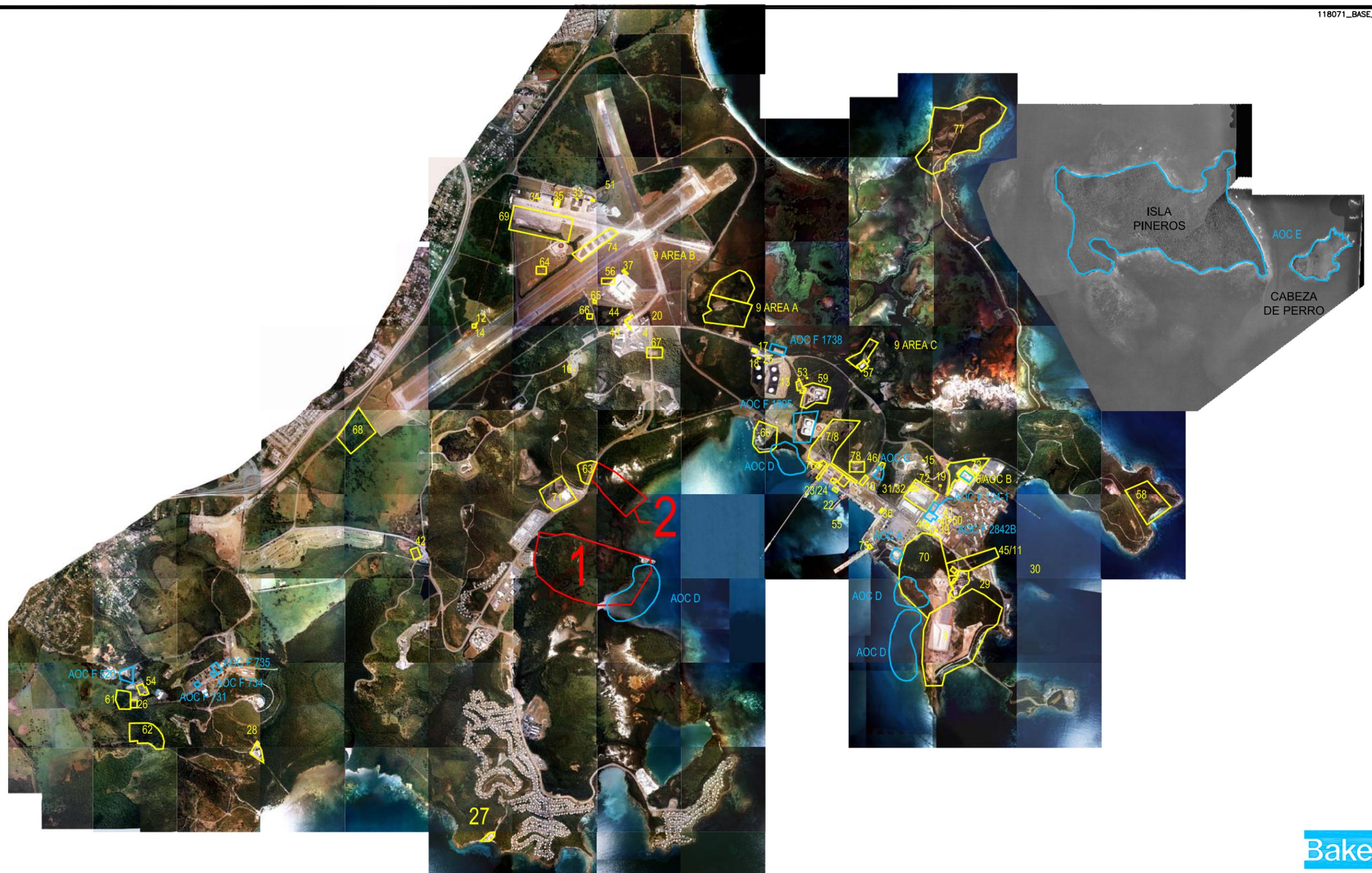


1 inch = 4 miles



FIGURE 1-1
REGIONAL LOCATION MAP
PHASE I INTERIM CORRECTIVE MEASURES
WORK PLAN FOR SWMUS 1 AND 2

SOURCE: METRODATA, INC., 1999. NAVAL ACTIVITY PUERTO RICO



LEGEND

- SWMUs
- AREA TO WHICH THIS WORK PLAN PERTAINS
- AOCs

SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

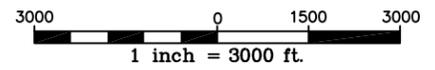
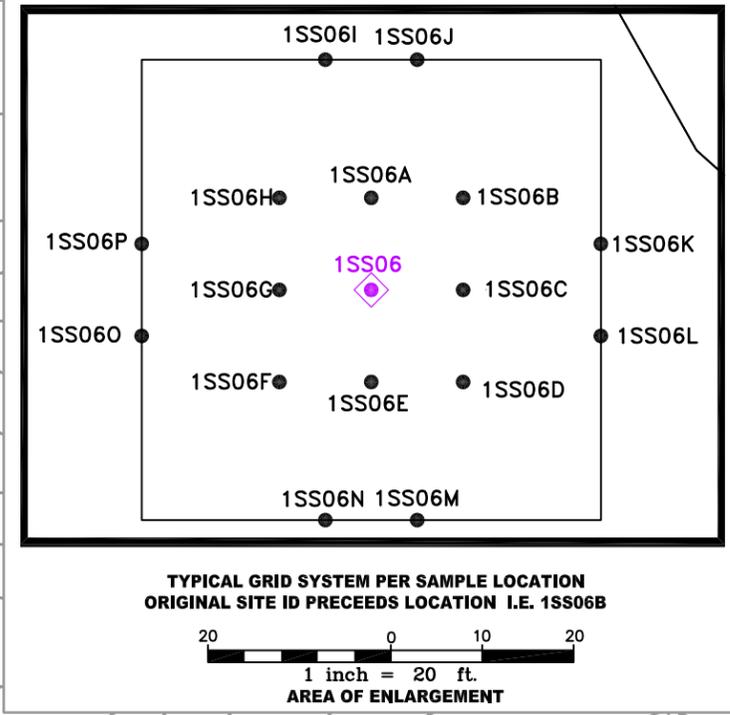
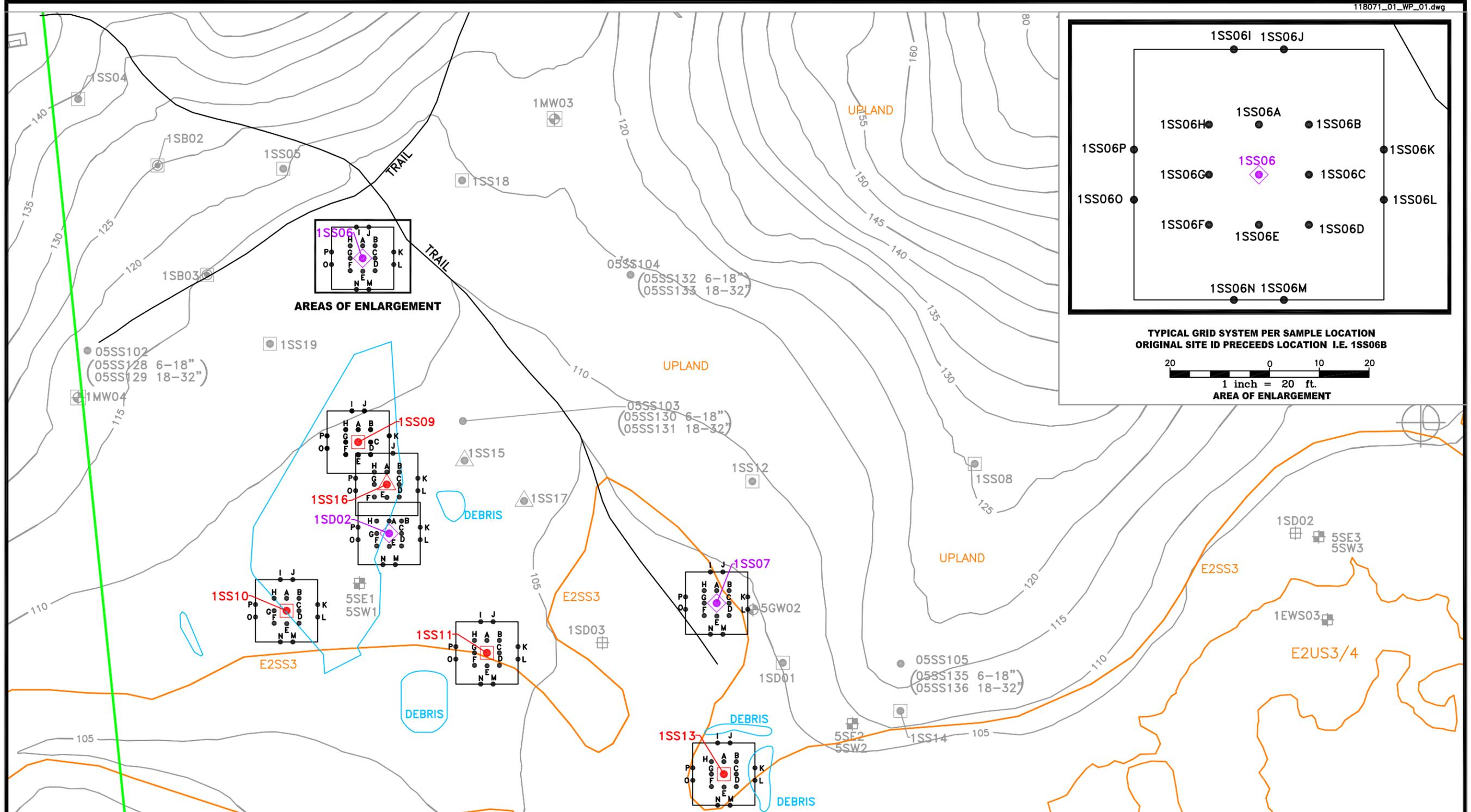


FIGURE 1-2
SWMU/AOC LOCATION MAP
PHASE I INTERIM CORRECTIVE MEASURES
WORK PLAN FOR SWMUS 1 AND 2
NAVAL ACTIVITY PUERTO RICO



COWARDAN WETLAND CLASSIFICATION
 E2SS3 - ESTUARINE INTERTIDAL SCRUB SHRUB BROAD-LEAVED EVERGREEN
 E2US3/4 - ESTUARINE INTERTIDAL UNCONSOLIDATED SHORE SAND/MUD
 UPLAND - UPLAND

- LEGEND**
- ① - SWMU 1
 - - PROPOSED DELINEATION SAMPLE
 - - DEBRIS PILE
 - ⊕ - REPORTED LOCATION OF 5GW03 (NOT LOCATED DURING 1996 RFI FIELD INVESTIGATION)
 - ⊕ - SEDIMENT SAMPLE LOCATION (RELATIVE RISK RANKING)
 - ⊕ - SURFACE WATER/SEDIMENT SAMPLE LOCATION (CONFIRMATION STUDY)
 - E2SS3 - COWARDAN WETLAND CLASSIFICATION SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.
 - - SOIL SAMPLE LOCATION (SUPPLEMENTAL INVESTIGATION)
 - ⊕ - SOIL BORING LOCATION (1996 RFI)
 - ⊕ - MONITORING WELL/SURFACE SOIL LOCATION (1996 RFI)
 - ⊕ - EXISTING MONITORING WELL LOCATION (CONFIRMATION STUDY)
 - - SURFACE SOIL SAMPLE LOCATION (1996 RFI)
 - - SURFACE SOIL SAMPLE LOCATION (2004 ADDITIONAL DATA COLLECTION)
 - ⊕ - SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (2004 ADDITIONAL DATA COLLECTION)
 - ⊕ - ESTUARINE WETLAND SYSTEM
 - ⊕ - SURFACE WATER/SEDIMENT SAMPLE LOCATION (2003 ADDITIONAL DATA COLLECTION)
 - ⊕ - SEDIMENT SAMPLE LOCATION (2004 ADDITIONAL DATA COLLECTION)

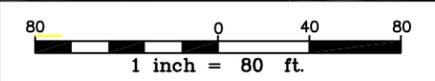
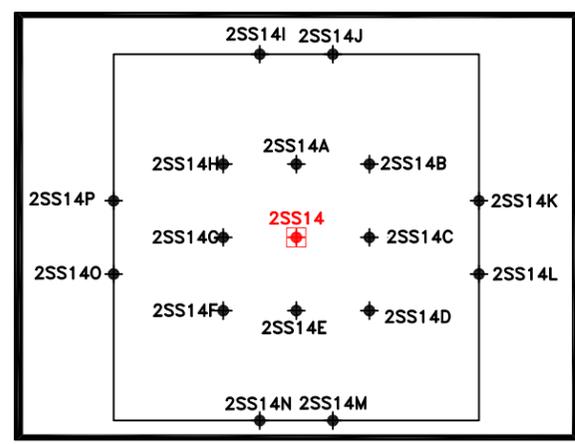
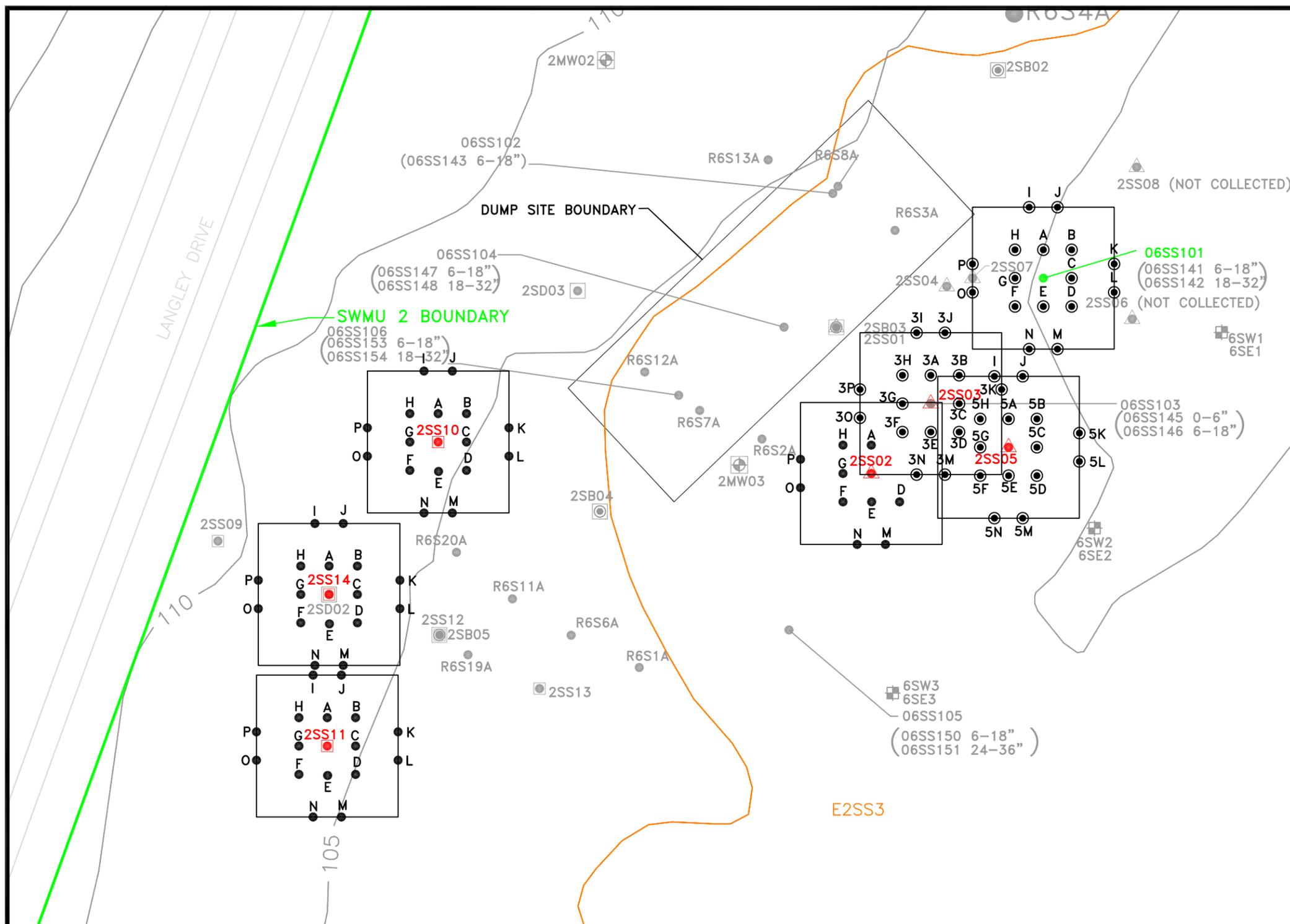
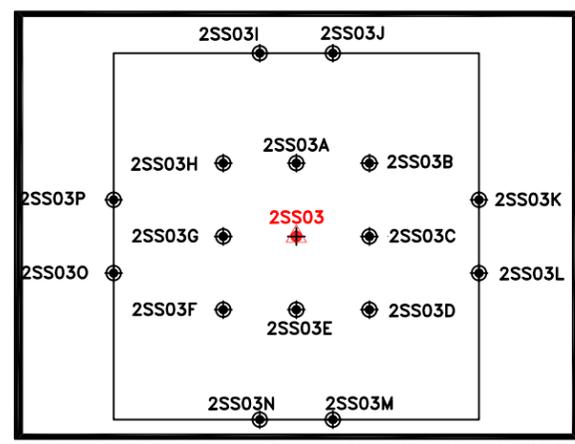


FIGURE 1-3
 SURFACE SOIL DELINEATION SAMPLING LOCATIONS FOR SWMU 1
 PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN FOR SWMUS 1 AND 2
 NAVAL ACTIVITY PUERTO RICO



TYPICAL GRID SYSTEM PER SAMPLE SURFACE LOCATION
ORIGINAL SITE ID PRECEEDS LOCATION I.E. 2SS14B
25 0 12.5 25
1 inch = 25 ft.
AREA OF ENLARGEMENT



TYPICAL GRID SYSTEM PER SAMPLE SUBSURFACE LOCATION
ORIGINAL SITE ID PRECEEDS LOCATION I.E. 2SS03B
25 0 12.5 25
1 inch = 25 ft.
AREA OF ENLARGEMENT

COWARDAN WETLAND CLASSIFICATION
 E2SS3 - ESTUARINE INTERTIDAL SCRUB SHRUB BROAD-LEAVED EVERGREEN
 E2US2 - ESTUARINE INTERTIDAL UNCONSOLIDATED SHORE SAND
 UPLAND - UPLAND

LEGEND	
	- SWMU
	- COWARDAN WETLAND CLASSIFICATION
	- PROPOSED DELINEATION SAMPLE
	- PROPOSED DELINEATION SURFACE AND SUBSURFACE SOIL SAMPLE
	- SURFACE SOIL SAMPLE LOCATION (1996 RFI)
	- SEDIMENT SAMPLE LOCATION (RELATIVE RISK RANKING)
	- SURFACE WATER/SEDIMENT SAMPLE LOCATION (CONFIRMATION STUDY)
	- SOIL SAMPLE LOCATION (APPROXIMATE) (SUPPLEMENTAL INVESTIGATION)
	- SOIL BORING LOCATION (1996 RFI)
	- SOIL SAMPLE LOCATION (APPROXIMATE) (CONFIRMATION STUDY)
	- MONITOR WELL LOCATION (1996 RFI)
	- EXISTING MONITOR WELL LOCATION (CONFIRMATION STUDY)
	- SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (2004 ADDITIONAL DATA COLLECTION EFFORT)
	- SURFACE SOIL SAMPLE LOCATION (2004 ADDITIONAL DATA COLLECTION EFFORT) ESTUARINE WETLAND SYSTEM
	- SURFACE WATER/SEDIMENT SAMPLE LOCATION (2003 ADDITIONAL DATA COLLECTION INVESTIGATION)

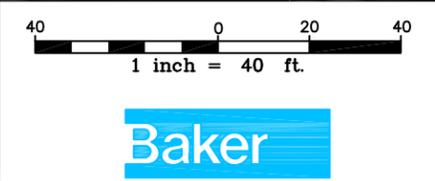
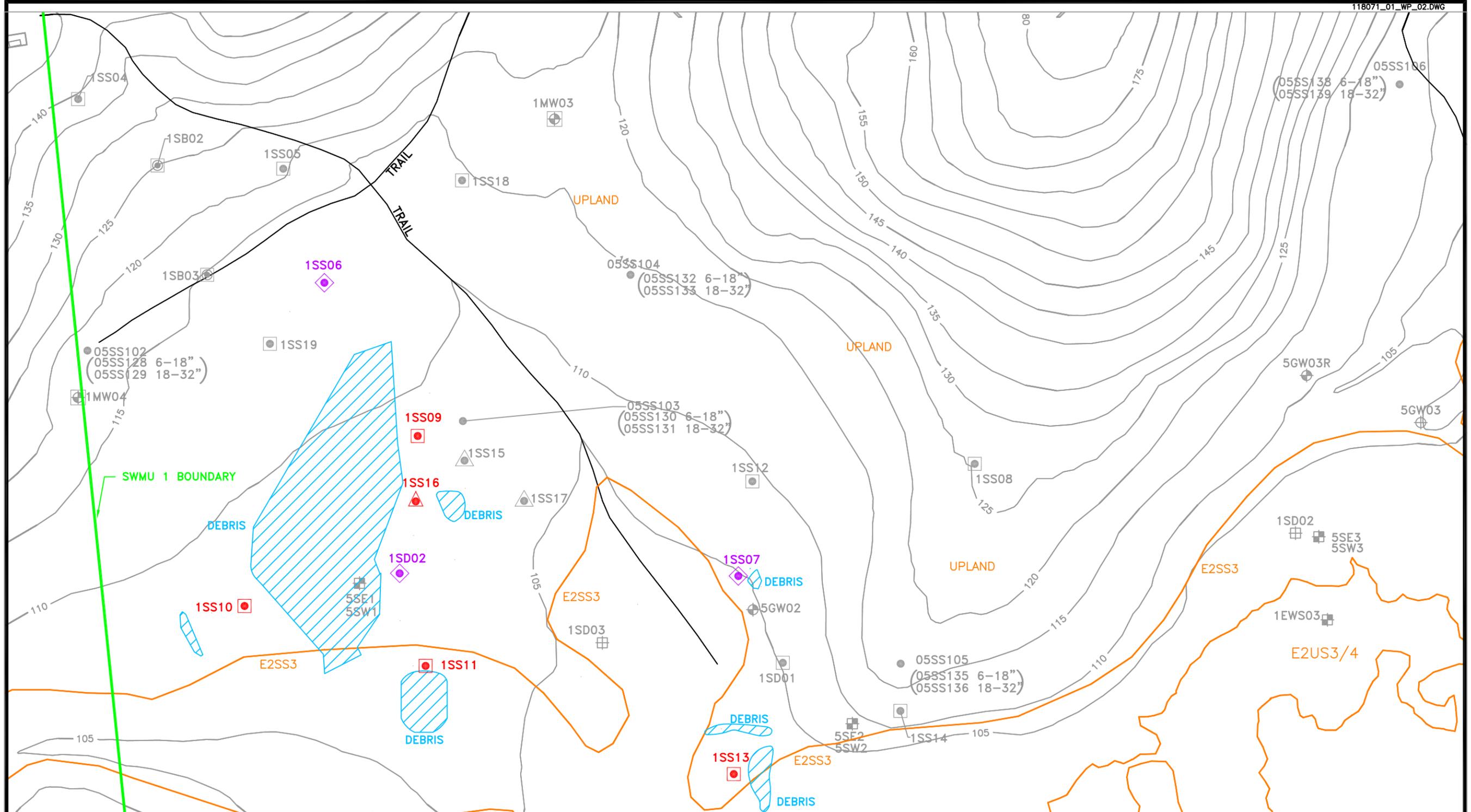


FIGURE 1-4
 SURFACE SOIL DELINEATION SAMPLING
 LOCATIONS FOR SWMU 2
 PHASE I INTERIM CORRECTIVE MEASURES
 WORK PLAN FOR SWMUS 1 AND 2
 NAVAL ACTIVITY PUERTO RICO



COWARDAN WETLAND CLASSIFICATION
 E2SS3 - ESTUARINE INTERTIDAL SCRUB SHRUB BROAD-LEAVED EVERGREEN
 E2US3/4 - ESTUARINE INTERTIDAL UNCONSOLIDATED SHORE SAND/MUD
 UPLAND - UPLAND

- LEGEND**
- SWMU 1
 - DEBRIS PILE
 - REPORTED LOCATION OF 5GW03 (NOT LOCATED DURING 1996 RFI FIELD INVESTIGATION)
 - SEDIMENT SAMPLE LOCATION (RELATIVE RISK RANKING)
 - SURFACE WATER/SEDIMENT SAMPLE LOCATION (CONFIRMATION STUDY)
 - COWARDAN WETLAND CLASSIFICATION

- SOIL SAMPLE LOCATION (SUPPLEMENTAL INVESTIGATION)
- SOIL BORING LOCATION (1996 RFI)
- MONITORING WELL/SURFACE SOIL LOCATION (1996 RFI)
- EXISTING MONITORING WELL LOCATION (CONFIRMATION STUDY)
- SURFACE SOIL SAMPLE LOCATION (1996 RFI)
- SURFACE SOIL SAMPLE LOCATION (2004 ADDITIONAL DATA COLLECTION)

- SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (2004 ADDITIONAL DATA COLLECTION)
- ESTUARINE WETLAND SYSTEM**
- SURFACE WATER/SEDIMENT SAMPLE LOCATION (2003 ADDITIONAL DATA COLLECTION)
 - SEDIMENT SAMPLE LOCATION (2004 ADDITIONAL DATA COLLECTION)

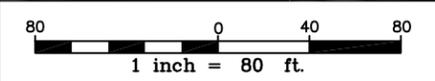
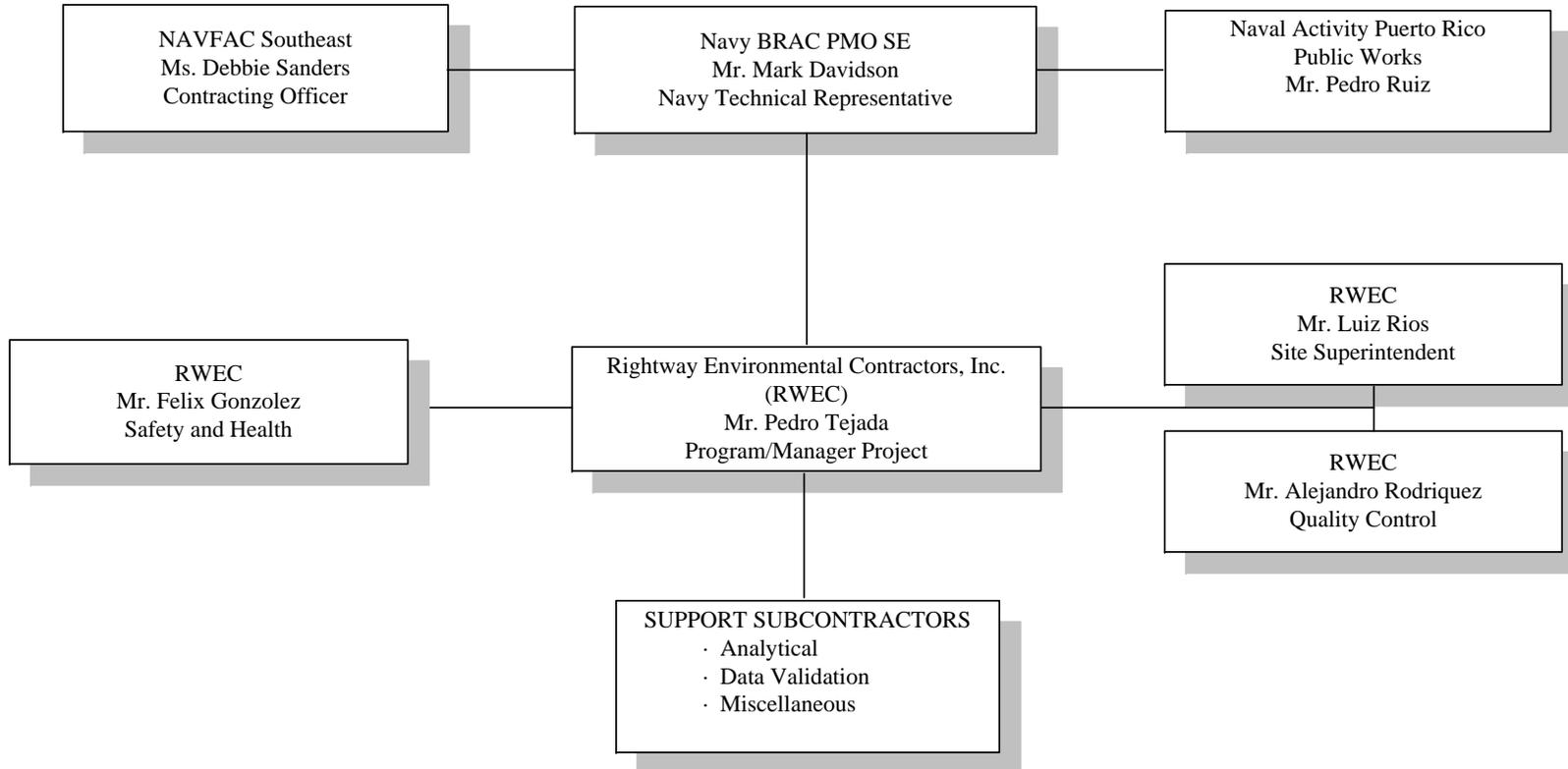


FIGURE 1-5
 SURFACE DEBRIS PILE LOCATIONS AT SWMU 1
 PHASE I INTERIM CORRECTIVE MEASURES
 WORK PLAN FOR SWMUS 1 AND 2

NAVAL ACTIVITY PUERTO RICO

APPENDIX A
ORGANIZATIONAL CHART

APPENDIX A
PROJECT ORGANIZATION
PHASE I INTERIM CORRECTIVE MEASURES WORK PLAN - SWMUs 1 & 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO



APPENDIX B
SITE SPECIFIC SAFETY AND HEALTH PLAN

DRAFT
SITE SPECIFIC HEALTH AND SAFETY PLAN
NAVAL ACTIVITY PUERTO RICO
PHASE I INTERIM CORRECTIVE MEASURES
SWMUs 1 and 2

NAVAL ACTIVITY PUERTO RICO
EPA I.D. NO. PR2170027203
CEIBA, PUERTO RICO

NOVEMBER 19, 2009

Prepared for:

DEPARTMENT OF THE NAVY
NAVFAC SOUTHEAST
North Charleston, SC

Under:

Contract No. N69450-09-C-0072

Prepared by:

RIGHT WAY ENVIRONMENTAL CONTRACTORS, INC.
Naranjito, Puerto Rico 00719

and

MICHAEL BAKER JR., INC.
Moon Township, Pennsylvania

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Appendix D Route to Hospital and Health Resource Clinic

Appendix E OSHA 300 Log

Appendix F Adverse Weather Conditions Plan

Appendix G Accident Protection Plan

Appendix H Safety Plan Acknowledgement

Appendix I Health and Safety Plan Amendment Documentation Form

LIST OF ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
BAC	Blood Alcohol Concentration
Baker	Michael Baker Jr., Inc.
bgs	Below Ground Surface
CFR	Code of Federal Regulation
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
°C	Degrees Celsius
dBA	A-Weighted Decibel
DEET	N, N-diethyl-Meta-toluamide
DF	Dengue Fever
DHF	Dengue Hemorrhagic Fever
EMA	Emergency Management Agency
EMS	Emergency Response Service
EPA	Environmental Protection Agency
ERCP	Emergency Response Contingency Plan
eV	Electron Volt
EZ	Exclusion Zone
f/b	Flash/Bang
Ft	Feet
°F	Degrees Fahrenheit
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBV	hepatitis B virus
HCV	hepatitis C virus
HIV	human immunodeficiency virus
HSC	Health and Safety Coordinator
HSM	Health and Safety Manager
IAS	Initial Assessment Study
LEL	Lower Explosive Limit
LEPC	Local Emergency Planning Commission
MHR	Maximum Heart Rate
mph	Miles Per Hour
MSDS	Material Safety Data Sheet
NAPR	Naval Activity Puerto Rico
NEESA	Naval Energy and Environmental Support Activity
NIOSH	National Institute for Occupational Safety and Health
NRR	Noise Reduction Rating
OPIM	Other Potentially Infectious Materials
OSHA	Occupational Safety and Health Administration

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

PEL	Permissible Exposure Level
PID	Photoionization Detector
PM	Project Manager
PPE	Personal Protection Equipment
ppm	Parts Per Million
PVC	Polyvinyl Chloride
RWEC	Right Way Environmental Contractors, Inc.
SARA	Superfund Amendments and Reauthorization Act
SS/SSO	Site Supervisor/Site Safety Officer
SSHO	Site Safety and Health Officer
SSHSP	Site Specific Health and Safety Plan
SSO	Site Safety Office
SWMU	Solid Waste Management Unit
SZ	Support Zone
TLV	Threshold Limit Value
TWA	Time Weighted Average
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
VOC	Volatile Organic Compound

1.0 INTRODUCTION

1.1 Objective

The objective of this plan is to provide a mechanism for establishing safe working conditions during the site delineation sampling efforts at Solid Waste Management Units (SWMUs) 1 and 2 and the debris removal activities being conducted at SWMU 1. The safety organization, procedures, and protective equipment have been established based upon an analysis of potential hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of accident or injury.

1.2 Policy Statement

The policy of Right Way Environmental Contractors, Inc. (RWEC) is to provide a safe and healthful work environment for all employees. RWEC considers no phase of operations or administration to be of greater importance than injury and illness prevention. Safety takes precedence over expediency and shortcuts. RWEC believes all accidents and injuries are preventable and will take every reasonable step to reduce the possibility of injury, illness, or accident.

This Site Specific Health and Safety Plan (SSHSP) prescribe the procedures that must be followed during site activities. Operational changes that could affect the health and safety of personnel or the community will not be made without the prior approval of the Project Manager (PM) and the Health and Safety Manager (HSM).

The provisions of this plan are mandatory for all personnel and subcontractors assigned to the project. All visitors to the work site must abide by the requirements of the plan.

1.3 References

This SSHSP complies with applicable Occupational Safety and Health Administration (OSHA), U.S. Environmental Protection Agency (EPA), and RWEC Health & Safety policies and procedures. This plan follows the guidelines established in the following:

- Standard Operating Safety Guides, EPA (Publication 9285.1-03, June 1992).
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute for Occupational Safety and Health (NIOSH), OSHA, U.S. Coast Guard (USCG), EPA (86-116, November 1985).
- Title 29 of the Code of Federal Regulations (CFR), Part 1910.
- Title 29 of the CFR, Part 1926.
- United States Army Corps of Engineers (USACE) Safety and Health Requirements Manual EM 385-1-1.

1.4 Disclaimer

The enclosed SSHSP have been designed for the methods presently contemplated by RWEC for execution of the proposed work. Therefore, the SSHSP may not be appropriate if the work is not performed by or using the methods presently contemplated by RWEC, or if the scope of work is modified. Each company or contractor is responsible for the safety and health of their personnel, for their actions, and for the work they perform. It is highly recommended that each company or contractor working at the Naval Activity Puerto Rico (NAPR) site perform their work under the supervision of their internal health and safety professionals.

2.0 SITE HISTORY/SCOPE OF WORK

2.1 Background

The existing airport facility at NAPR was in operation for 60 years until the base was closed in March 2004. During the lifetime of the facility, different areas were used for fire training and aircraft maintenance, leaving these areas with contaminants of concern that serve as the basis for this current removal action.

SWMU 1, The Former Cremator Disposal Site, is located adjacent to and east of the Navy Lodge, encompasses an area of roughly 116 acres of land (see Figure 1-2). The SWMU is bounded to the north by Kearsage Road leading to the U.S. Customs Pier, Ensenada Honda to the east, estuarine wetlands to the south, and the Navy Lodge and Bowling Alley to the west. In addition to the upland habitat depicted on Figure 1-3, estuarine wetland and open water habitat are included within the boundary of SWMU 1. Based on previous reports, the Army Cremator Disposal Site operated from the early 1940s until the early 1960s and was the main station landfill during this period. The waste material was disposed of by piling, burning, and compacting (A.T. Kearney, Inc., 1988). According to the Naval Energy and Environmental Support Activity (NEESA), an estimated 100,000 tons of waste, including scrap metal, inert ordnance, batteries, tires, appliances, cars, cables, dry cleaning solvent cans, paint cans, gas cylinders, construction debris, dead animals, and residential waste was disposed of at this SWMU (NEESA, 1984). No reliable information exists regarding the amounts of material present in the disposal area that could be hazardous; however, in 1984, an Initial Assessment Study (IAS) team estimated that as much as 1,000 tons of hazardous material could be present (NEESA, 1984). Previous investigations completed at SWMU 1 indicate the presence of pesticides (4,4'-DDD, 4,4'-DDE, 4,4' DDT) and metals (antimony, cadmium, copper, lead, tin, mercury and zinc) in the surface soil (0-1 feet [ft] below ground surface [bgs]).

SWMU 2, The Langley Drive Disposal Site, is located along Langley Drive, approximately 1,000 ft northeast of the Navy Commissary and encompasses an area of approximately 28 acres as presented in Figure 1-2. This site consists of an abandoned, unlined waste-pile/landfill, on the edges of, and protruding into the mangroves along the shoreline of Ensenada Honda. This site was utilized from 1939 to 1959 for disposal of solid and possibly hazardous wastes/constituents. Previous studies conducted at this site indicate the presence of metals (antimony, copper, lead, and mercury) in the surface soil (0-1 ft bgs and 1-2 ft bgs).

2.2 Scope of Work

This SSHSP focuses on work requirement of the site sampling at SWMUs 1 and 2 and debris removal at SWMU 1.

The principal tasks to be conducted are listed below:

- Site preparation.
- Surface soil delineation sampling.
- Debris removal from site.
- Staging of debris for disposal.
- Site restoration.

All site activities have been analyzed for potential hazards by reviewing available Material Safety and Data Sheets (MSDS), included in this plan as Appendix A and Appendix B, Activity Hazard Analysis (AHA).

3.0 KEY PERSONNEL AND MANAGEMENT

The PM, Site Supervisor/Site Safety Officer (SS/SSO), and the HSM are responsible for formulating and enforcing health and safety requirements and implementing this SSHSP. The following summarizes the health and safety responsibilities of the site management.

3.1 Project Safety Responsibilities

The PM has the overall responsibility for the project and to assure that the requirements of the contract are attained in a manner consistent with the SSHSP requirements. The PM will coordinate with the SS/SSO to assure that the work is completed in a manner consistent with the SSHSP. The SS/SSO is responsible for field implementation of the SSHSP. The SS/SSO will be the main contact in any on-site emergency situation and will insure off-site emergency agencies have been contacted prior to the start of work. The PM, HSM, Health and Safety Coordinator (HSC) and SS/SSO are authorized to administer this SSHSP. All site personnel are authorized to stop work when an imminent health or safety risk exists. The PM is responsible for reviewing the SSHSP and ensuring that the SSHSP is complete and accurate. The HSC will also provide technical and administrative support for the Health and Safety Program and will be available for consultation when required. Each employee is responsible for personal safety as well as the safety of others in the work area.

3.1.1 Site Safety Officer Requirements

The Site Safety and Health Officer (SSHO) meets the minimum requirements for an SSHO as specified in EM 385 1-1, Nov. 3, 03, Section 1, and includes as a minimum:

- Completion of 10-Hour OSHA Construction Safety Course
- Completion of 40-Hour Hazardous Waste Site Operations Training per 29 CFR 1919.120 and subsequent annual updates

3.1.2 Site Safety Office Duties

The Site Safety Officer's (SSO) duties are as follows:

The SSO is responsible for implementing the SSHSP, which satisfies federal, state, and local regulations and is consistent with site conditions. The SSO may take actions independent of the project group to stop the project, if required, for noncompliance with the SSHSP.

The Site Supervisor is responsible for the day-to-day implementation of the SSHSP during site activities. In conjunction with the Site Supervisor, the SSO will oversee the day-to-day implementation of the SSHSP, including the following responsibilities:

- Directing the entrance and exit medical physical requirements, if required
- Approval of PPE and safety procedures specified in the SSHSP
- Overseeing the maintenance and use of field monitoring equipment necessary to define on-site hazards associated with remediation

- Designating appropriate personnel protection level; determining protection level upgrades and downgrades as site conditions permit.
- Providing necessary guidance to the project staff so they can safely perform their functions in accordance with federal and state regulations.

3.2 Key Safety Personnel

The following individuals share responsibility for health and safety at the site:

Project Manager	Pedro Tejada (787) 857-8832 (office) (787) 630-9881 (cellular)
Site Superintendent	Luis A. Rios (787) 607-1536 (cellular)
Site Safety Officer	Alejandro Rodriguez (787) 857-8832 (office)
Program Health & Safety Manager	Pedro Tejada (787) 857-8832 (office) (787) 630-9881 (cellular)
Health & Safety Consultant	Felix Gonzalez (787) 751-5499(office)

4.0 ACTIVITY HAZARDS

Sampling and debris removal will be completed as indicated on the project plans generated by Michael Baker Jr., Inc. (Baker).

Operation of heavy equipment will be performed to minimize the impact to areas outside of the limits of disturbance. Communications between equipment operators and field techs working in the area will be maintained at all times. Trucks entering the base will have been inspected and drivers will be instructed as to route and procedures.

4.1 Chemical Hazards

Site personnel will be in direct contact with underlying materials and contaminated soils. The contaminants of concern are anticipated to be as follows:

SWMU 1 Soil: pesticides (4,4'-DDD, 4,4'-DDE, 4,4' DDT) and metals (antimony, cadmium, copper, lead, tin, mercury and zinc) in the surface soil (0-1 ft bgs)

SWMU 2 Soil: metals (antimony, copper, lead, and mercury) in the surface soil (0-1 ft bgs and 1-2 ft bgs).

In addition, materials will be used during construction activities that may be hazardous. The MSDS for these chemicals are included in this report as Appendix A.

The following general symptoms may indicate exposure to a hazardous chemical. Personnel will be removed from the work site and provided immediate medical attention if the following symptoms occur:

- Loss of appetite
- Weakness in wrists or ankles
- Dizziness or stupor
- Nausea, headaches, or cramps
- Irritation of the eyes, nose, or throat
- Chest pains and coughing
- Rashes or burns.

4.2 Hazard Communication

The purpose of hazard communication (Employee Right-to-Know) is to ensure that the hazards of all chemicals located at this field project site are transmitted (communicated) according to 29 CFR 1926.59 to all personnel and subcontractors.

4.2.1 Container Labeling

RWEC personnel will ensure that all containers are labeled according to contents. These drums and containers will include those from manufacturers and those produced on site by operations, such as gasoline and diesel safety cans. All incoming and outgoing labels shall be checked for identity, hazard warning, and name and address of responsible party.

4.2.2 Material Safety Data Sheets

There will be an MSDS located on site for all site contaminants and each hazardous chemical known to be used on site. MSDS's are located in Appendix A of the SSHSP.

4.2.3 Employee Information and Training

Training employees on chemical hazards is accomplished through an ongoing corporate training program. All site employees shall maintain their HAZWOPER training in accordance with 29 CFR 1910.120. Additionally, chemical hazards are communicated to employees through daily safety meetings held at RWEC field projects and by an initial site orientation program.

At a minimum, RWEC and related subcontractor employees will be instructed on the following:

- An in-depth review of the soil and surface contaminants of concern identified.
- OSHA regulated chemicals and their hazards in the work area.
- How to prevent exposure to these hazardous chemicals.
- What the company has done to prevent workers' exposure to these chemicals.
- Procedures to follow if they are exposed to these chemicals.
- How to read and interpret labels and MSDS's for hazardous substances found on RWEC sites.
- Emergency spill procedures.
- Proper storage and labeling.

Before any new hazardous chemical is introduced on site, each RWEC and related subcontractor employee will be given information in the same manner as during the safety class. The site supervisor will be responsible for seeing that the MSDS on the new chemical is available for review by on site personnel. The information pertinent to the chemical hazards will be communicated to project personnel.

Morning safety meetings will be held and the hazardous materials used on site will be discussed. Attendance is mandatory for all on site employees.

4.3 Physical Hazards

To minimize physical hazards, RWEC has developed standard safety protocols that will be followed at all times. AHA, located in Appendix B, has been developed for each principal activity and identifies the major hazards to which employees may be exposed.

The SS/SSO will observe the general work practices of each crewmember and equipment operator, and will enforce safe procedures. The crew leaders and SS/SSO will inspect the work areas. All hazards will be corrected in a timely manner. A variety of physical hazards may be encountered during work activities at this site. Hard hats, safety glasses and steel-toe safety boots are required in all areas of the site. Site-specific hazards and all necessary precautions will be discussed at the daily safety meetings. Failure to follow safety protocols will result in removal of an employee from the site and appropriate disciplinary actions.

4.4 Environmental Hazards

Environmental factors such as weather, wild animals, insects, and irritant plants may pose a hazard when performing outdoor tasks. The SS/SSO will take necessary actions to alleviate these hazards should they arise.

4.4.1 Heat Stress

The combination of warm ambient temperature and protective clothing increases the potential for heat stress. Heat stress disorders include:

- Heat rash
- Heat cramps
- Heat exhaustion
- Heat stroke.

This information will be reviewed during safety meetings. Workers are encouraged to increase consumption of water and electrolyte-containing beverages; e.g., Gatorade. Heat stress can be prevented by assuring an adequate work/rest schedule.

In addition, workers are encouraged to take rests and report symptoms whenever they feel any adverse effects that may be heat-related. The frequency of breaks may need to be increased based on worker recommendation to the SS/SSO. Heat stress can be prevented by assuring an adequate work/rest schedule and adequate fluid consumption. A guide for work/rest schedules for various protection levels are given below in Table 4.1. The number of hours before a work/rest period is based on experience with similar work. The time periods should be considered maximum. It must also be remembered that individual physical variability's and differences in physical work activities may require revisions to site plans. This table should be used as a guide. Professional judgment of the SS/SSO is necessary to assure a fully protective plan to prevent heat stress disorders.

Table 4.1
Guidelines For Work-Rest Periods
Protection Level
Number of Hours Before Rest Period

Temperature	Level D	Level C	Level B	Level A
90+ F*	2.0	1.5	1.0	0.5
87.5 F	2.5	2.0	1.5	1.0
82.5 F	3.0	2.5	2.0	1.5
77.5 F	3.5	3.0	2.5	1.5
72.5	4.0	3.5	2.5	1.5

*Work above 100° F will be reviewed with the Project HSC to determine specific requirements.

Alternately the work/rest schedule can be calculated based on heat stress monitoring results. Each individual will count his/her radial (wrist) pulse as early as possible during each rest period. If the heart rate exceeds 75 percent of their calculated maximum heart rate (MHR) (MHR = 200 – age) at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. An individual is not permitted to return to work until his/her sustained heart rate is below 75 percent of their calculated maximum heart rate.

Body temperature, measured orally or through the ear canal, may also be monitored to assess heat stress. Workers should not be permitted to continue work when their body temperature exceeds 100.4 degrees Fahrenheit (°F) or (38 degrees Celsius (°C)). Monitoring should be conducted at the beginning of each break period as noted above.

Monitoring for heat stress will begin when the ambient temperature reaches or exceeds 70 °F when wearing chemical protective clothing (Level C, B, A), or 80 °F for site activities performed with no chemical protective clothing (Level D). Monitoring will include pulse rate, weight loss, oral/ or ear canal temperature, signs and symptoms of heat stress and fluid intake.

4.4.2 Noise

Hearing protection is required for workers operating or working near heavy equipment where the noise level is greater than 85 A-weighted decibel (dBA) Time Weighted Average (TWA) as well as personnel working around heavy equipment. The SS/SSO will determine the need and appropriate testing procedures (i.e., sound level meter and/or dosimeter).

Noise monitoring should be conducted during the beginning of each activity, as well as, any time modifications lead to increased noise levels (e.g., adding additional equipment). A sound level meter will be used to measure noise levels at selected locations in the work area and on the site perimeter when treatment equipment is operating normally. When used, noise-monitoring equipment must be calibrated before and after each shift.

If continuous noise levels are found to exceed 85 dBA at any location within the work area, warning signs will be posted. Workers and visitors will be notified that hearing protection is required. Appropriate hearing protection (e.g., ear plugs) will be worn whenever personnel are working or visitors are present in that location. A supply of earplugs will be maintained on site.

Action levels in the following table will trigger the use of appropriate hearing protection (plugs or muffs). Hearing protection must be able to attenuate noise below 90 dBA (8-hour TWA). Each hearing protection or device has a Noise Reduction Rating (NRR) assigned by the EPA. The calculation for a hearing protection device’s effectiveness is: noise reading dBA – (NRR – 7dB) < 90 dBA. The results are presented in Table 4.2.

**Table 4.2
Guidelines for Hearing Protection**

Instrument	Measurement	Action
Type I or Type II Sound Level Meter or dosimeter	>80 dBA → 85 dBA	Hearing protection recommended. Limit work duration to 8-hour shifts.
	>85 dBA → 90 dBA	Hearing protection required. Limit work duration to 8-hour shifts.
	>90 dBA → 115 dBA	Hearing protection required. Investigate use of engineering controls. Limit work duration to 8 hour shifts.
	>115 dBA	Stop work. Consult Project HSM

4.4.3 Biological Hazards

4.4.3.1 Mosquito Borne Diseases

West Nile Virus, West Nile Encephalitis, and Dengue are human health concerns in the Caribbean and United States. West Nile Virus has spread rapidly throughout the Caribbean since its initial detection in humans in 2001 (PubMed, 2006). It is caused by the bite of a mosquito, infected with the West Nile virus.

West Nile Encephalitis is a viral infection of the brain transmitted through the bite of a mosquito, which has previously fed on birds and/or horses that were infected with West Nile Virus. "Encephalitis" means an inflammation of the brain, and it can be caused by viral and bacterial infections. West Nile Encephalitis can be a serious or even fatal illness although this is rare in humans. This illness develops in approximately one of every 150 infections and is generally confined to older and physically compromised individuals. Dead birds in an area may mean that West Nile Virus is circulating between the birds and the mosquitoes in that area. West Nile Virus is not transmitted from one person to another. Human illness from West Nile Virus is rare, even in areas where the virus has been reported.

Most people who become infected with West Nile Virus will have either no symptoms or only mild ones. Symptoms of West Nile Encephalitis include high fever, headache, confusion, muscle aches and weakness, seizures, or paralysis. At its most serious, the infection can result in coma, permanent neurological damage, and death. Symptoms usually occur five to 15 days following the bite of an infected mosquito. Because West Nile Encephalitis is a viral infection, antibiotics are not effective and there is no specific treatment available other than general support therapy.

Dengue is a dangerous mosquito-borne viral disease affecting humans; its global distribution is comparable to that of malaria, and an estimated 2.5 billion people live in areas at risk for epidemic transmission. Each year, tens of millions of cases of dengue fever (DF) occur and, depending on the year, up to hundreds of thousands of cases of dengue hemorrhagic fever (DHF). The case-fatality rate of DHF in most countries is about 5%, but this can be reduced to less than 1% with proper treatment. Most fatal cases are among children and young adults.

Classic dengue fever or "break bone fever" is characterized by acute onset of high fever 3-14 days after the bite of an infected mosquito. Patients develop frontal headache, retro-orbital pain, myalgias, arthralgias, nausea, vomiting, and often a maculopapular rash. Many patients notice a change in taste sensation. Acute symptoms, when present, usually last about 1 week, but weakness, malaise, and anorexia may persist for several weeks. A high proportion of infections produce minimal or no symptoms, especially in children. Treatment emphasizes relief of symptoms, avoiding aspirin and other non steroidal anti-inflammatory medications and encouraging oral fluid intake

Protective Measures at Projects

There is no vaccine to protect humans against West Nile Virus or Dengue. Individuals at project sites can reduce their risk from being infected with West Nile Virus by taking the following actions to protect against mosquito bites:

- Review the hazards of West Nile Virus and Dengue periodically in morning safety meetings.

- Increase protective measures when working at dawn, dusk, and in the early evening.
- Reduce the area of exposed skin when working outdoors. Long-sleeved shirts with sleeves rolled down are recommended. Understand that mosquitoes may bite through thin clothing, so personnel should evaluate the actual Level D clothing worn, e.g., heavy long sleeve work shirts and heavy jeans may be indicated. Also, the risk or threat of mosquito bites is reduced for those activities that require the use of disposable coveralls.
- For activities where only Level D Personal Protection Equipment (PPE) is specified, consider using disposable coveralls when working in wooded, highly vegetated, or swampy areas.
- Use an insect repellent containing approximately 25% DEET (N, N-diethyl-metoluamide). DEET in concentrations greater than 25% provides no additional protection but repel insects longer. However, at some point there is no direct correlation between concentration and repellency. For example, 50% DEET provides about four hours of protection against mosquitoes, but increasing the concentration to 100% provides only one additional hour of protection. Use the repellent according to the manufacturer's directions provided on the container. Use just enough repellent to cover exposed skin and clothing. Do not treat unexposed skin. Frequent re-application is unnecessary for effectiveness. Avoid prolonged and excessive use of DEET.
- After returning from outdoor field activities, wash treated skin with soap and water.
- Personnel should report flu-like symptoms to the SSHO.

Employees should avoid applying it to open wounds and irritated skin as it may further irritate the skin or cause discomfort.

Sweating, perspiration and getting wet may wash away the repellent and may require that DEET containing repellent be re-applied.

To remove the breeding places on a project, the following precautions will be followed as practical:

- Cut tall grass and weeds.
- Drain accumulated water in such items as drums, buckets, pools and plastic containers.
- Repair holes in door and window screens.
- Eliminate stagnate water puddles as practical.
- Limit outdoor activities at dawn, dusk and early evening, when mosquitoes are most active, as practical.

4.4.3.2 Blood Borne Pathogens

All human blood and human body fluids should be treated as if they are known to be infectious for human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), and/or other blood borne pathogens. All employees must observe universal precautions to prevent contact with blood or other potentially infectious materials (OPIM). When a body fluid is difficult or impossible to identify, all body fluids must be considered OPIM. Appendix C contains the RWEC Blood Borne Pathogens Exposure Control Plan.

4.4.4 Lightning

The procedures provided below will be used to protect site personnel from lightning related injuries.

Training. A tailgate safety meeting will be conducted to increase awareness to the hazards and prevention of lightning related incidents.

Detection of Lightning. The SS/SSO will be proactive in monitoring conditions that may produce thunderstorms and lightning. A daily and weekly weather forecast will be tracked and communicated to site personnel. When signs of impending storms, i.e., increasing wind, darkening skies, or lightning appear, local weather monitoring will be increased. The National Weather Service (www.nws.noaa.gov/) should be consulted frequently. Personnel will be notified when thunderstorms may impact the site.

The "flash/bang" (f/b) technique of measuring the distance to lightning will be reviewed with all personnel. The f/b technique is defined as: for each five seconds from the time of observing the lightning flash to hearing the associated thunder, the lightning is one mile away.

Suspension/Resumption of Activities. All outside activities will be suspended when a lightning flash is immediately in the area or an f/b of 20 seconds (4 miles away) is noted. Personnel may continue indoor work activities. Outdoor activities will resume when 30 minutes has passed since the last observable f/b is 20 seconds or greater.

Lightning Protection. When notification is given, all outside work activities will stop and personnel will gather in the support zone for a head count and further instructions. Indoor work will continue, except for the use of electrical equipment, telephones and computers. When a safe location is not present and personnel are caught by a sudden lightning event, employees should seek the lowest possible area, away from large objects which might attract lightning or fall over, e.g., trees, utility poles. The employee should assume a crouching position with their head lowered and hands over their ears. **AVOID: WATER, HIGH GROUNDS, HEAVY EQUIPMENT AND TALL, ISOLATED OBJECTS.**

First Aid. An employee that is struck by lightning needs immediate assistance (call 911). The body will not carry an electrical charge, but receives an electrical shock and may be burned. Personnel certified in first-aid/cardiopulmonary resuscitation (CPR) should inspect for shock and burns around fingers, toes, buckles and jewelry. Stay with the injured employee until medical help arrives.

4.5 Vehicle and Heavy Equipment Safety Management

4.5.1 Vehicle Safety

Motor vehicle incidents are the number one cause of occupational fatalities, accounting for one in three deaths. Fifty percent or more of vehicle safety incidents occur while backing up.

General Requirements:

RWEC requires employees to use seat belts at all times when traveling in RWEC's owned or leased/rented vehicles. The SS/SSO will develop a parking area plan, including backing vehicles into parking spaces, using spotters for backing vehicles and policy mandated vehicle inspections.

RWEC employees are expected to incorporate safe actions and preparations to avoid vehicle accidents and personal injury during work and off-hours. Breaks should be planned into lengthy job mobilizations and demobilizations, including rotation of drivers at regular intervals. If parking areas are busy or crowded and more than one worker is traveling in the same vehicle, one worker should remain outside the vehicle as it leaves the parking space to assist the driver with traffic observation

RWEC's employees arriving at work areas should park vehicles away from delivery, heavy equipment and vehicle loading/unloading locations to prevent parked vehicles from damage by various deliveries. Heavy equipment operators should inspect areas and request vehicles to be moved or spotters used if necessary, to maneuver equipment in tight areas. Employees who observe near misses or potential risks to parked or moving vehicles must report these to the SS/SSO immediately.

RWEC's employees are expected to use the vehicle inspection form and check/test the safety systems on the vehicle on a daily basis. Check the following: brakes, mirrors, seat belts, tires, leakage from the undercarriage, lights and turn signals. Vehicles with safety deficiencies must be reported immediately and not driven until properly repaired. Vehicles running errands from different project sites should have telephone numbers of the job site in the vehicle in case calls for assistance are required.

Because of the different ways alcohol can affect behavior, even in very small amounts, the best and safest course is not to drink before driving. At RWEC, a driver with blood alcohol concentration (BAC) over 0.04 percent is considered to be under the influence and subject to disciplinary action. Personnel involved in motor vehicle incidents are subject to drug and alcohol testing.

Weather conditions can have a profound effect on driving. On slippery roads, drive more slowly. Stop and turn with care. Keep several car lengths from other vehicles. At speeds in excess of 35 miles per hour (mph), the chances of hydroplaning increase with speed. In general, keep back 1 car length for every 10 mph to prevent striking the car ahead.

Vehicles will be operated in accordance with the requirements listed below:

- Seatbelt use is mandatory for all passengers
- Personnel may not ride in the back of cargo vehicles

- Vehicle speed is limited to the posted speed limits for developed roadways, 25 mph maximum on dirt roads and 10 mph maximum off-road (based on conditions)
- Vehicle driven in four wheel low and low gear when on dirt roads or off road driving where steep grades dictate
- All operators must possess a valid driver's license
- Fuel or gasoline are not to be transported inside the passenger compartment
- No vehicle is left running when unattended
- Parking brakes are used when vehicles are parked.

In the event of a vehicle incident, notify your PM immediately and complete all required reports.

4.5.2 Heavy Equipment Safety

Forklifts, excavators, loaders, other material handling equipment present various physical hazards on remediation sites. The following critical safety practices shall be followed to prevent safety incidents during heavy equipment operation.

- All equipment will be inspected prior to each use.
- All operators will have training or equivalent experience to be permitted to operate heavy equipment.
- Spotters will be used to back-up equipment and direct traffic in all "blind" areas.
- Standard hand signals will be used to communicate between operators and ground crew.
- All heavy equipment will have operable back-up alarms.
- Heavy equipment will be parked in areas where operators will not be exposed to strains or slip/trip/fall hazards during mounting and dismounting of equipment.
- All heavy equipment will be equipped with operable seat belts; belts will be used by all operators.
- Written lifting plans will be developed and reviewed for all critical lifts.

4.6 Manual Material Lifting

Many different types of objects may be handled manually during site operations. Care should be taken when lifting and handling heavy or bulky items because they are the cause of many back injuries. The following fundamentals address the proper lifting techniques that are essential in preventing back injuries:

The size, shape, and weight of the object to be lifted must first be considered. No individual employee is permitted to lift any object that weighs more than 60 pounds. Multiple employees or the use of mechanical lifting devices are required for objects over the 60-pound limit.

- The anticipated path to be taken by the lifter should be inspected for the presence of slip, trip, and fall hazards.
- The feet shall be placed far enough apart for good balance and stability (typically shoulder width). The footing shall be solid.
- The worker shall get as close to the load as possible. The legs shall be bent at the knees.
- The back shall be kept as straight as possible and abdominal muscles should be tightened.
- To lift the object, the legs are straightened from their bending position.
- A worker shall never carry a load that cannot be seen over or around.
- When placing an object down, the stance and position are identical to that for lifting. The legs are bent at the knees and the object lowered.

When two or more workers are required to handle the same object, coordination is essential to ensure that the load is lifted uniformly and that the weight is equally divided between the individuals carrying the load. When carrying the object, each worker, if possible, shall face the direction in which the object is being carried. In handling bulky or heavy items, the following guidelines shall be followed to avoid injury to the hands and fingers:

- A firm grip on the object is essential; leather gloves shall be used if necessary.
- The hands and object shall be free of oil, grease, and water that might prevent a firm grip and the fingers shall be kept away from any points that could cause them to be pinched or crushed, especially when setting the object down.
- The item shall be inspected for metal slivers, jagged edges, burrs, and rough or slippery surfaces prior to being lifted.

4.7 Activity Hazard Analysis

Appendix B contains AHA for primary site tasks. They contain detailed information on physical and chemical hazards, and provide control measures for these hazards. The AHA's will be field checked by the SS/SSO on an ongoing basis and revised as necessary. All revisions will be communicated to the work crew.

5.0 WORK AND SUPPORT AREAS

Work zones will be established according to wind direction, area to be excavated and exit routes. When necessary, each work area will be clearly identified using signs or physical barriers.

5.1 Support Zone

The uncontaminated support zone (SZ), or clean zone, will be located upwind, in an area outside the exclusion zone (EZ) and contamination reduction zone (CRZ) and within the geographic perimeters of the site. The area is used for material staging, vehicle parking, office facilities, sanitation facilities, and receipt of deliveries. Personnel entering this zone may include delivery personnel, visitors, security guards, etc., who will not necessarily be permitted in the EZ. All personnel arriving in the SZ will, upon arrival, report to the SS/SSO and sign the site visitor log.

5.2 Contamination Reduction Zone

Personnel and equipment decontamination will be performed in the CRZ that is adjacent to the EZ. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination and for the purpose of accountability. Personal protective outer garments and respiratory protection will be removed in the CRZ and properly labeled. All water generated from equipment and personal decontamination will be contained on site and disposed of in an appropriate manner.

5.3 Exclusion Zone

The EZ will be the area around excavated areas and/or the areas with elevated air monitoring readings. This area has the highest potential for exposure to contamination by contact, ingestion, or inhalation. All employees will use proper PPE when working in these areas. The location of the EZ will be identified by fencing or other appropriate means primarily around the excavation areas and the stockpiles. A daily entry log records the time of entry and exit from the EZ for each person.

A log of all personnel visiting, entering or working on the site shall be maintained by the SS/SSO. Visitors will attend a site orientation given by the SS/SSO and sign the SSHSP.

The following are standard safe work practices that apply to all site personnel and will be discussed in the safety briefing prior to initiating work on the site:

- Eating, drinking, chewing gum or tobacco, smoking is prohibited in the EZ/CRZs.
- A buddy system will be used. Hand signals will be established to maintain communication.
- During site operations, each worker will consider himself as a safety backup to his partner. Off-site personnel provide emergency assistance.
- Visual contact will be maintained between buddies on site when performing hazardous duties.

- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the SS/SSO, will be immediately dismissed from the site.
- Proper decontamination procedures must be followed before leaving the site.
- All employees and visitors must sign in and out of the site.

6.0 PROTECTIVE EQUIPMENT

This section specifies the levels of PPE, which is required for each principal activity performed at this site. All site personnel must be trained in the use of all PPE utilized.

6.1 Anticipated Protection Levels

The following protection levels have been established for the site work activities.

Table 6.1
Anticipated Protection Levels

Task	Initial PPE Level	Upgrade PPE Level	Skin Protection	Respiratory Protection	Other PPE
Areas outside of designated contaminated soil locations (SZ)	Level D	Modified Level D	Leather-work gloves. Tyvek® coverall as necessary to protect against biological hazards	None	Hard-hat, steel-toe work boots, safety glasses and hearing protection >85 dBA. Goggles/face shield when in contact with liquid contamination or flying debris.
Areas of contaminated soils (EZ and CRZ)-general work PPE level	Level C	Not Anticipated	Tyvek® coverall, inner latex sample gloves, outer nitrile gloves and latex boot covers	Full face respirator	Hard-hat, steel-toe work boots, safety glasses and hearing protection >85 dBA. Goggles/face shield when in there is a potential for splash hazards
General Support Zone Activities-(SZ)	Level D	Not Anticipated	None	None	Hard-hat, steel-toe boots, safety glasses and hearing protection >85dBA.

6.2 Protection Levels Descriptions

This section lists the minimum requirements for each protection level. Modification to these requirements may have been noted above.

6.2.1 Level D

Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots

- Work clothing as prescribed by weather
- Leather work gloves
- Cut resistant gloves when handling sharp objects
- Reflective vests for ground personnel working around heavy equipment or roadways
- Hearing protection in areas >85 dBA

6.2.2 Modified Level D

Modified Level D consists of the following:

- Safety glasses with side shields
- Hard hat
- Steel-toed work boots
- Tyvek® coverall (when handling dry materials)
- Poly-coated Tyvek® coverall or PVC rain suit (when handling wet materials)
- Latex over-boots
- Inner latex sample gloves
- Outer nitrile gloves
- Hearing protection in areas >85 dBA
- Full-face shield when splash hazards are present
- Metatarsal and shin guard for pressure sprayer operations

6.2.3 Inspection and Cleaning

Respirators shall be checked periodically by a qualified individual and inspected before each use by the wearer. All respirators and associated equipment will be decontaminated and hygienically cleaned after each use.

6.2.4 Fit Testing

Annual respirator fit tests are required of all personnel wearing negative-pressure respirators. The test will use isoamyl acetate or irritant smoke. The fit test must be for the style and size of the respirator to be used. Quantitative fit-testing is required for use of respirators in chemical environments where the respirator effective use limit exceeds 10 (exposure of 1 part per million (ppm) inside the respirator for 10 ppm outside the respirator). Therefore, quantitative fit-testing is dependent on the permissible exposure level (PEL)/threshold limit value (TLV) of the chemical substance involved. Quantitative fit-testing is required for potential exposure to airborne particulate levels that exceed 10 times the established PEL/TLV.

6.2.5 Facial Hair

No personnel who have facial hair which interferes with the respirator's sealing surface will be permitted to wear a respirator and will not be permitted to work in areas requiring respirator use.

6.2.6 Corrective Lenses

Normal eyeglasses cannot be worn under full-face respirators because the temple bars interfere with the respirator's sealing surfaces. For workers requiring corrective lenses,

special spectacles designed for use with respirators will be provided. Contact lenses are permitted to be used with full-face respirators based on a decision by OSHA.

6.2.7 Medical Certification

Only workers who have been certified by a physician, as being physically capable of respirator usage will be issued a respirator. Personnel unable to pass a respiratory fit test or without medical clearance for respirator use will not be permitted to enter or work in areas on site that require respiratory protection. Employees will receive a written physician's opinion that they are fit for general hazardous waste operations as per 29 CFR 1910.120(f)(7).

6.3 Site-Specific Personal Protective Equipment

The primary objective of the PPE program is to ensure employee protection and to prevent employee exposure to site contaminants during site operations. Engineering controls are not feasible for many tasks and, therefore, require the use of PPE.

The SS/SSO will be responsible for monitoring all aspects of the PPE program. This includes donning and doffing, temperature related stress monitoring, inspection, and decontamination. PPE selection is identified in Table 6.1 for each specified task. The SS/SSO, in consultation with the HSC, and the HSM will direct changes in PPE based on changing conditions. The site-specific SSHSP will serve as written certification that the workplace was evaluated concerning PPE requirements.

7.0 DECONTAMINATION PROCEDURES

This section describes the procedures necessary to ensure that both personnel and equipment are free from contamination when they leave the work site.

7.1 Personnel Decontamination

Decontamination procedures will ensure that material which workers may have contacted in the EZ do not result in personal exposure and is not spread to clean areas of the site. This sequence describes the general decontamination procedure. The specific stages will vary depending on the site, the task, the protection level, etc.

7.1.1 Modified Level D Decontamination

- Go to the end of the EZ
- Remove and discard latex booties
- Remove outer gloves and discard
- Remove protective suit
- Remove inner sample gloves and discard
- Wash face and hands.

7.1.2 Level C Decontamination

1. Go to the end of the EZ
2. Remove and discard latex booties
3. Remove outer gloves and discard
4. Remove outer suit (Poly-coated Tyvek®, Tyvek® or polyvinyl chloride (PVC) rain suit)
5. Cross into CRZ (dirty side of respirator wash area)
6. Remove and wash respirator (4 stages)
 - a. Soap and water solution
 - b. First rinse
 - c. Disinfect respirator (1 cap full of bleach to 1 gallon of water)
 - d. Final rinse
 - e. Hang respirator to dry
7. Remove inner sample gloves and discard
8. Wash face and hands.

7.1.3 Suspected Contamination

Any employee suspected of sustaining skin contact with chemical materials will first use the emergency shower. Following a thorough drenching, the worker will proceed to the decontamination facility. Here the worker will remove clothing, shower, don clean clothing, and immediately be taken to the first aid station. Medical attention will be provided based on the degree of injury.

7.1.4 Personal Hygiene

Before any eating, smoking, or drinking, personnel will wash hands, arms, neck and face.

7.2 Equipment Decontamination

All contaminated equipment will be decontaminated before leaving the site. Decontamination procedures will vary depending upon the contaminant involved, but may include sweeping, wiping, scraping, hosing, or steaming the exterior of the equipment. Personnel performing this task will wear the proper PPE as prescribed by the SS/SSO.

7.3 Disposal

All decontamination liquids and disposable clothing will be treated as contaminated waste unless determined otherwise by accepted testing methods. Wastes will be disposed of according to state and federal regulations.

8.0 AIR MONITORING

Air monitoring will be conducted in order to characterize personnel exposures and fugitive emissions from site contaminants. The principle contaminants of concern are hydrocarbons.

8.1 Work Area Air Monitoring

Work area air monitoring at SWMU 68 will be by direct reading methods. Photoionization Detector (PID) meter will be used to monitor personal exposures while the removal action is implemented. Air monitoring results will be used to determine the effectiveness and/or need for control methods.

Table 8.1
Direct Reading Air Monitoring Requirements

Monitoring Device	Monitoring Location/ Personnel	Monitoring Frequency	Action Level	Action
PID	Breathing Zone Monitoring	Continuous during all activities involving disturbance of soils.	1 ppm above background sustained for 1 minute	If PID reads greater than 1 mu (meter unit) above background for up to 5 minutes, PPE=Level C

8.2 Instrumentation

The following is a description of the air monitoring equipment (MiniRAE 2000 PID) to be used at this site.

8.2.1 Principle of Operation

MiniRAE 2000 portable PID is a broadband volatile organic compound (VOC) gas monitor and data logger for work in hazardous environments. It monitors VOCs using a PID with a 9.8 electron volts (eV), 10.6eV or 11.7eV gas discharge lamp.

8.2.2 Calibration Methods/Frequencies

MiniRAE 2000 should be calibrated each day before it is used.

There are two calibrations methods used:

1. Fresh air calibration - Fresh air calibration should be performed in an area known to be free of contaminants and/or using a charcoal filter.
2. Known concentration gas cylinder - This procedure determines the second point of the sensor calibration curve for the sensor. A cylinder of standard reference gas (span gas) fitted with a 500 cc/min. flow Limiting regulator or a flow-matching regulator.

8.2.3 Preventative Maintenance

Maintenance of the MiniRAE 2000 consists of maintaining the instrument clean, recharging of battery. Prior to entering a confined-space area or hot work involving welding, cutting, or other high heat-producing operations where flammable or combustible vapors may be present, lower explosive limit (LEL)/O₂ measurements will be taken.

8.3 Air Monitoring Log

The SS/SSO will ensure that all air-monitoring data is logged into a notebook. Data will include instrument used, wind direction, work process, etc. The Site SS and PM will periodically review this data.

8.4 Calibration Requirements

The air monitoring equipment will be calibrated daily. A separate log will be kept by the SS/SSO detailing date, time, span gas, or other standard, and name of person performing the calibration.

8.5 Air Monitoring Results

Air monitoring results will be available for personnel inspection, and they will be discussed during morning safety meetings.

9.0 EMERGENCY RESPONSE

9.1 Pre-Emergency Planning

Prior to engaging in remediation activities at the site, RWEC will plan for possible emergency situations and have available adequate supplies and manpower to respond. In addition, site personnel will receive training during the site orientation concerning proper emergency response procedures.

The following situations would warrant implementation of the Emergency Response and Contingency Plan (ERCP):

**Table 9-1
Situations Requiring Emergency Response**

Fire/Explosion	The potential for human injury exists. Toxic fumes or vapors are released. The fire could spread on-site or off-site and possibly ignite other flammable materials or cause heat-induced explosions. The use of water and/or chemical fire suppressants could result in contaminated run-off.
Spill or Release of Hazardous Materials	The spill could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard. The spill could cause the release of toxic liquids or fumes in sufficient quantities or in a manner that is hazardous to or could endanger human health.
Natural Disaster	A rainstorm exceeds the flash flood level. The facility is in a projected tornado path or a tornado has damaged facility property. Severe wind gusts are forecasted or have occurred and have caused damage to the facility. Hurricanes
Medical Emergency	Overexposure to hazardous materials. Trauma injuries (broken bones, severe lacerations/bleeding, burns). Eye/skin contact with hazardous materials. Loss of consciousness. Heat stress (Heat stroke). Heart attack. Respiratory failure. Allergic reaction.

The following measures will be taken to assure the availability of adequate equipment and manpower resources:

- Sufficient equipment and materials will be kept on site and dedicated for emergencies only. The inventory will be replenished after each use.
- On-site emergency responders will be current in regards to training and medical surveillance programs. Copies of all applicable certificates will be kept on file for on-site personnel required to respond.

- It will be the responsibility of the Site Supervisor to brief the on-site response team on anticipated hazards at the site. The Emergency Coordinator shall also be responsible for anticipating and requesting equipment that will be needed for response activities.
- Emergency response activities will be coordinated with the Local Emergency Management Agency (EMA) in compliance with the Superfund Amendments and Reauthorization Act (SARA) Title III requirements.

Communications will be established prior to commencement of any activities at the remediation site. Communication will be established so that all responders on site have availability to all pertinent information to allow them to conduct their activities in a safe and healthful manner. The primary communication device will be air horns.

9.2 Emergency Recognition and Prevention

Because unrecognized hazards may result in emergency incidents, it will be the responsibility of the Site Supervisor and the SSO, through daily site inspections and employee feedback (Safety Observation Program, daily safety meetings, and AHA) to recognize and identify all hazards that are found at the site. These may include:

**Table 9-2
Examples of Site Hazards**

Chemical Hazards	Materials at the site Materials brought to the site
Physical Hazards	Fire/explosion Slip/trip/fall Excessive noise
Mechanical Hazards	Pinch points Vehicle traffic
Environmental Hazards	Electrical Storms High winds Heavy Rain/Snow Temperature Extremes (Heat Stress) Poisonous Plants/Animals

Once a hazard has been recognized, the SS/SSO will take immediate action to prevent the hazard from becoming an emergency. This may be accomplished by the following:

- Daily safety meeting
- Task-specific training prior to commencement of activity
- PPE selection/use
- Following all RWEC standard operating procedures

**Table 9.3
Emergency Telephone Numbers**

Local Agencies:	
Ambulance	911
Fire	911
Police	911
Hospital :	
Hospital San Pablo del este. HIMA 404 Avenida General Valero, Fajardo, PR 00738 (787)863-0505 The SSO must verify location and develop directions to the hospital before beginning any site activities.	(787)-863-0505
Regional Poison Control Center	(800)-552-6337
Federal Agencies: Agency for Toxic Substances and Disease Registry National Response Center	(404) 639-0615 (24 hr.) (800)-424-8802
Michael Baker Jr, Inc.	To be Determined
RWEC Personnel:	
Project Manager – Pedro Tejada	(787) 857-8832 (office) (787) 630-9881 (cellular)
Site Supervisor – Luis Rios	(787) 607-1536 (cellular)
Site Safety Officer – Felix Gonzalez	(787) 674-1562 (cellular)

9.3 Personnel Roles, Lines of Authority and Communications

This section describes the roles, responsibilities, and communication procedures that will be followed by personnel involved in emergency responses.

The primary Emergency Coordinator for this site is the Site Supervisor. In the event an emergency occurs and the Emergency Coordinator is not on site, the SS/SSO or the highest-ranking employee on site will serve as the Emergency Coordinator until he arrives. The Emergency Coordinator will determine the nature of the emergency and take appropriate action as defined by this ERCP.

The Emergency Coordinator will implement the ERCP immediately as required. The decision to implement the plan will depend upon whether the actual incident threatens human health or the environment. Immediately after being notified of an emergency incident, the Emergency Coordinator or his designee will evaluate the situation to determine the appropriate action.

9.3.1 Responsibilities and Duties

This section describes the responsibilities and duties assigned to the Emergency Coordinator.

It is recognized that the structure of the “Incident Command System” will change as additional response organizations are added. RWEC will follow procedures as directed by the Fire Department, Local Emergency Planning Commission (LEPC), State and Federal agencies as required. RWEC will defer to the local Fire Department Chief to assume the role of Incident Commander upon arriving on site. Additional on-site personnel may be added to the Site Emergency Response Team as required to respond effectively.

9.3.2 On-Site Emergency Coordinator Duties

The On-Site Emergency Coordinator is responsible for implementing and directing the emergency procedures. All emergency personnel and their communications will be coordinated through the Emergency Coordinator. Specific duties are as follows:

- Identify the source and character of the incident, type and quantity of any release. Assess possible hazards to human health or the environment that may result directly from the problem or its control.
- Discontinue operations in the vicinity of the incident if necessary to ensure that fires, explosions, or spills do not recur or spread to other parts of the site.
- Notify the NAPR personnel. NAPR will contact the local Emergency Response Teams if their help is necessary to control the incident. Table 9.1 provides telephone numbers for emergency assistance.
- Direct on-site personnel to control the incident until, if necessary, outside help arrives.
- Ensure that the building or area where the incident occurred and the surrounding area are evacuated, and shut off possible ignition sources, if appropriate. The Emergency Response Team is responsible for directing site personnel such that they avoid the area of the incident and leave emergency control procedures unobstructed.
- If fire or explosion is involved, notify facility Fire Department.
- Notify RWEC & Baker Project Manager
- Notify NAPR
- Have protected personnel, in appropriate PPE, on standby for rescue.
- If the incident may threaten human health or the environment outside of the site, the Emergency Coordinator should immediately determine whether evacuation of area outside of the site may be necessary and, if so, notify the Naval Activity Puerto Rico. The NAPR will contact the local Police Department and the Office of Emergency Management.

If hazardous waste has been released or produced through control of the incident, ensure that:

- Waste is collected and contained.
- Containers of waste are removed or isolated from the immediate site of the emergency.
- Treatment or storage of the recovered waste, contaminated soil or surface water, or any other material that results from the incident or its control is provided.
- Ensure that no waste that is incompatible with released material is treated or stored in the facility until cleanup procedures are completed.
- Ensure that all emergency equipment used is decontaminated, recharged, and fit for its intended use before operations are resumed.

9.3.3 Safe Distances and Places of Refuge

The Emergency Coordinator for all activities will be the SS/SSO. No single recommendation can be made for evacuation or safe distances because of the wide variety of emergencies that could occur. Safe distances can only be determined at the time of an emergency based on a combination of site and incident-specific criteria. However, the following measures are established to serve as general guidelines.

In the event of minor hazardous materials releases (small spills of low toxicity), workers in the affected area will report initially to the contamination reduction zone. Small spills or leaks (generally less than 55 gallons) will require initial evacuation of at least 50 feet in all directions to allow for cleanup and to prevent exposure. After initial assessment of the extent of the release and potential hazards, the Emergency Coordinator or his designee will determine the specific boundaries for evacuation. Appropriate steps such as caution tape, rope, traffic cones, barricades, or personal monitors will be used to secure the boundaries.

If an incident may threaten the health or safety of the surrounding community, the public will be informed and, if necessary, evacuated from the area. The Emergency Coordinator, or his designee, will inform the proper agencies in the event that this is necessary. Telephone numbers are listed in Table 9.1.

Places of refuge will be established prior to the commencement of activities. These areas must be identified for the following incidents:

- Chemical release
- Fire/explosion
- Medical emergency
- Hazardous weather.

In general, evacuation will be made to the main entrance to the RWEC staging area, unless the Emergency Coordinator determines otherwise. It is the responsibility of the Emergency Coordinator to determine when it is necessary to evacuate personnel to off-site locations.

In the event of an emergency evacuation, all the employees will gather at the entrance to the site until a head count establishes that all are present and accounted for. No one is to leave the site without notifying the Emergency Coordinator.

9.3.4 Evacuation Routes and Procedures

All emergencies require prompt and deliberate action. In the event of an emergency, it will be necessary to follow an established set of procedures. Such established procedures will be followed as closely as possible. However, in specific emergency situations, the Emergency Coordinator may deviate from the procedures to provide a more effective plan for bringing the situation under control. The Emergency Coordinator is responsible for determining which situations require site evacuation.

9.3.5 Evacuation Signals and Routes

Two-way radio communication and an air horn will be used to notify employees of the necessity to evacuate an area or building involved in a release/spill of a hazardous material. The crew supervisor will have a two-way radio. Only the Emergency Coordinator will initiate total site evacuation, however, in his absence, decision to preserve the health and safety of employees will take precedence.

9.3.6 Evacuation Procedures

In the event evacuation is necessary, the following actions will be taken:
The emergency signal will be activated.

- No further entry of visitors, contractors, or trucks will be permitted. Vehicle traffic within the site will cease in order to allow safe exit of personnel and movement of emergency equipment.
- Shut off all machinery if safe to do so.
- ALL on-site personnel, visitors, and contractors in the support zone will assemble at the entrance to the site for a head count and await further instruction from the Emergency Coordinator.
- ALL persons in the exclusion zone and contamination reduction zone will be accounted for by their immediate crew leaders (e.g., foreman). Leaders will determine the safest exits for employees and will also choose an alternate exit if the first choice is inaccessible.
- During exit, the crew leader should try to keep the group together. Immediately upon exit, the crew leader will account for all employees in his crew.
- Upon completion of the head count, the crew leader will provide the information to the Emergency Coordinator.
- Contract personnel and visitors will also be accounted for.
- The names of emergency response team members involved will be reported to the emergency spill control coordinator.

- The Emergency Coordinator, or designee, will make a final tally of persons. No attempt to find persons not accounted for will involve endangering lives of RWEC or other employees by re-entry into emergency areas.

In all questions of accountability, immediate crew leaders will be held responsible for those persons reporting to them. Visitors will be the responsibility of those employees they are seeing. Contractors and truck drivers are the responsibility of the Site Supervisor.

- Personnel will be assigned by the Emergency Coordinator to be available to direct and brief emergency responders.
- Re-entry into the site will be made only after the Emergency Coordinator gives clearance. At his direction, a signal or other notification will be given for re-entry into the facility.

9.4 Emergency Spill Response Procedures and Equipment

In the event of an emergency involving a hazardous material spill or release, the following general procedures will be used for rapid and safe response and control of the situation. Emergency contacts found in Table 9.1 provide a quick reference guide to follow in the event of a major spill.

9.4.1 Notification Procedures

If an employee discovers a chemical spill or process upset resulting in a vapor or material release, he or she will immediately notify the on-site Emergency Coordinator. On-site Emergency Coordinator will obtain information pertaining to the following:

- The material spilled or released.
- Location of the release or spillage of hazardous material.
- An estimate of quantity released and the rate at which it is being released.
- The direction in which the spill, vapor or smoke release is heading.
- Any injuries involved.
- Fire and/or explosion or possibility of these events.
- The area and materials involved and the intensity of the fire or explosion.

This information will help the on-site Emergency Coordinator to assess the magnitude and potential seriousness of the spill or release.

9.4.2 Procedure for Containing/Collecting Spills

The initial response to any spill or discharge will be to protect human health and safety, and then the environment. Identification, containment, treatment and disposal assessment will be the secondary response.

- Construction of a temporary containment berm utilizing on-site clay absorbent earth
- Digging a sump, installing a polyethylene liner

- Diverting the spill material into the sump placing drums under the leak to collect the spilling material before it flows over the ground
- Transferring the material from its original container to another container.
- The Emergency Coordinator will notify NAPR of the spill and steps taken to institute clean up. Emergency response personnel will clean up all spills following the spill clean-up plan developed by the Emergency Coordinator. Supplies necessary to clean up a spill will be immediately available on-site. Such items may include, but are not limited to:
 - Shovel, rake
 - Sorbent materials
 - Personal safety equipment
 - Steel drums
 - Miscellaneous hand tools.

Clean up personnel will take the following measures:

1. Make sure all unnecessary persons are removed from the hazard area.
2. Put on protective clothing and equipment.
3. If a flammable material is involved, remove all ignition sources, and use spark and explosion proof equipment for recovery of material.
4. Remove all surrounding materials that could be especially reactive with materials in the waste. Determine the major components in the waste at the time of the spill.
5. If wastes reach a storm sewer, try to dam the outfall by using sand, earth, sandbags, etc. If this is done, pump this material out into a temporary holding tank or drums as soon as possible.
6. Place all small quantities of recovered liquid wastes (55 gallons or less) and contaminated soil into drums for incineration or removal to an approved disposal site.
7. Spray the spill area with foam, if available, if volatile emissions may occur.
8. Apply appropriate spill control media (e.g., clay, sand, lime, etc.) to absorb discharged liquids.
9. For large spills, establish diking around leading edge of spill using booms, sand, clay or other appropriate material. If possible, use diaphragm pump to transfer discharged liquid to drums or holding tank.

9.4.3 Emergency Response Equipment

The following equipment will be staged in the support zone and throughout the site, as needed, to provide for safety and first aid during emergency responses:

- ABC-type fire extinguisher
- First aid kit, industrial size
- Eyewash
- Emergency signal horn.

9.4.4 Emergency Spill Response Clean-Up Materials and Equipment

A sufficient supply of appropriate emergency response clean-up and personal protective equipment will be inventoried and inspected, visually, on a weekly basis.

The materials listed below may be kept on site for spill control, depending on the types of hazardous materials present on site. The majority of this material will be located in the support zone. Small amounts will be placed on pallets and located in the active work areas.

- Appropriate solvents (e.g., CITRIKLEEN, for decontamination of structures or equipment).
- Sand or clay to solidify/absorb liquid spills.

9.4.5 Medical Emergency Contingency Measures

The procedures listed below will be used to respond to medical emergencies. The SS/SSO will contact the local hospital and inform them of the site hazards and potential emergency situations. A minimum of two first-aid/CPR trained personnel will be maintained on site. Directions to the local hospital are included in this plan as Appendix D.

9.4.6 Response

The nearest workers will immediately assist a person who shows signs of medical distress or who is involved in an accident. The work crew supervisor will be summoned.

The work crew supervisor will immediately make radio contact with the on-site Emergency Coordinator to alert him of a medical emergency situation. The supervisor will advise the following information:

- Location of the victim at the work site
- Nature of the emergency
- Whether the victim is conscious
- Specific conditions contributing to the emergency, if known.

The Emergency Coordinator will notify the Site Safety Officer. The following actions will then be taken depending on the severity of the incident:

Life-Threatening Incident. If an apparent life-threatening condition exists, the crew supervisor will inform the Emergency Coordinator by radio, and the local Emergency Response Services (EMS) will be immediately called. An on-site person will be appointed who will meet the EMS and have him/her quickly taken to the victim. Any injury within the EZ will be evacuated by RWEC personnel to a clean area for treatment by EMS personnel. No one will be able to enter the EZ without showing proof of training, medical surveillance and site orientation.

An accident/injury/illness report will be completely and properly filled out and submitted to the Project Manager in accordance with RWEC's reporting procedures.

Non Life-Threatening Incident. All injuries, no matter how small, will be reported to the SS/SSO. If it is determined that no threat to life is present, the SS/SSO will direct the injured person through decontamination procedures appropriate to the nature of the illness or accident. Appropriate first-aid or medical attention will then be administered.

The area surrounding an accident site must not be disturbed until the scene has been cleared by the Site Supervisor.

9.4.7 Notification

The following personnel/agencies will be notified in the event of a medical emergency:

- Local Fire Department or EMS
- On-site Emergency Coordinator
- Workers in the affected areas
- Notify RWEC PM
- Notify Naval Activity Puerto Rico representative.

In the event of a work related injury or illness, OSHA 300 Log must be filled out. A copy has been included with this plan as Appendix E.

9.4.8 Fire Contingency Measures

RWEC's personnel and subcontractors are not trained professional firefighters. Therefore, if there is any doubt that a fire can be quickly contained and extinguished, personnel will notify the Emergency Coordinator by radio and vacate the structure or area. The Emergency Coordinator will immediately notify the local Fire Department.

The following procedures will be used to prevent the possibility of fires and resulting injuries:

- Sources of ignition will be kept away from where flammable materials are handled or stored.
- "No smoking" signs will be conspicuously posted in areas where flammable materials are present and throughout the exclusion and contamination reduction zones.
- Fire extinguishers will be located in all RWEC site dedicated vehicles and placed in all areas where a fire hazard may exist.
- Before workers begin operations in an area the foreman will give instruction on egress procedures and assembly points. Egress routes will be posted in work areas and exit points clearly marked.

The following procedures will be used in the event of a fire:

- Anyone who sees a fire will notify his or her supervisor who will then contact the Emergency Coordinator by radio. The Emergency Coordinator will activate the emergency air horns and contact the local Fire Department.
- When the emergency siren sounds, workers will disconnect electrical equipment in use (if possible) and proceed to the nearest fire exit.
- Work crews will be comprised of pairs of workers (buddy system) who join each other immediately after hearing the fire alarm and remain together throughout the emergency. Workers will assemble at a predetermined rally point for a head count.
- When a worker has extinguished a small fire, the Emergency Coordinator will be notified.

9.5 Hazardous Weather Contingency Measures

Operations will not be started or continued when the following hazardous weather conditions are present:

- Lightning
- Heavy Rains
- High Winds

9.5.1 Response

All equipment will be shut down and secured to prevent damage.

Personnel will be moved to safe refuge. The Emergency Coordinator will determine when it is necessary to evacuate personnel to off-site locations and will coordinate efforts with fire, police, and other agencies. The adverse weather condition plan is included as Appendix F.

9.5.2 Notification

The Emergency Coordinator will be responsible for assessing hazardous weather conditions and notifying personnel of specific contingency measures. Notifications will include:

- RWEC's employees and subcontractors
- NAPR

10.0 TRAINING REQUIREMENTS

As a requirement for work at this site, in any hazardous waste work area, all field personnel will be required to take a 40-hour training class covering the requirements of 29 CFR 1910.120: personal protective equipment, toxicological effects of various chemicals, hazard communication, blood borne pathogens, handling of unknown tanks and drums, confined-space entry procedures, electrical safety, etc. In addition, all personnel must receive annual 8-hour refresher training and three-day on-site training under a trained, experienced Superintendent. Supervisory personnel shall have received additional 8-hour training in handling hazardous waste operations.

All personnel entering the work areas will be trained in the provisions of this Site Safety Plan and the Accident Prevention Plan (Appendix G) and be required to sign the Site Safety Plan Acknowledgment in Appendix H.

Outlines of the orientation for RWEC’s personnel and subcontract personnel and visitors are presented below. Any changes to the Health and Safety Plan will be documented in the Health and Safety Plan Amendment documentation form, Appendix I.

**Table 10.1
Training Outlines**

RWEC/SUBCONTRACTORS	VISITOR ORIENTATION
SSHSP sign off Sign in/out procedures Site background Chain of command Rules and regulations Hours of work Absences Equipment Emergency Information Emergency signal Gathering point Responsibilities/roles Emergency phone numbers Work Zones Contaminants, MSDS’s [Hazard Communication Program] AHAs Forms, site-specific Incident Reporting	SSHSP signoff Review of Site map Work Zones in progress Hazard Communication Emergency plan/signals Training/medical requirements Zones/areas open to visitors

11.0 MEDICAL SURVEILLANCE PROGRAM

All RWEC personnel participate in a medical and health monitoring program. This program is initiated when the employee starts work with a complete physical and medical history and is continued on a regular basis. A listing of RWEC's worker medical profile requirements is shown below.

All field personnel performing activities in a designated EZ or CRZ shall within the past 12 months have completed a comprehensive medical examination. The annual medical includes the following elements:

- Medical and occupational history questionnaire
- Physical examination
- Complete blood count, with differential
- Chest x-ray, once every 1 year.
- Pulmonary function test
- Electrocardiogram.
- Visual acuity
- Follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The medical surveillance program meets the requirements of the OSHA Standard 29 CFR 1910.120/1926.65(f).

12.0 REFERENCES

Standard Operating Safety Guides, EPA (Publication 9285.1-03, June 1992).

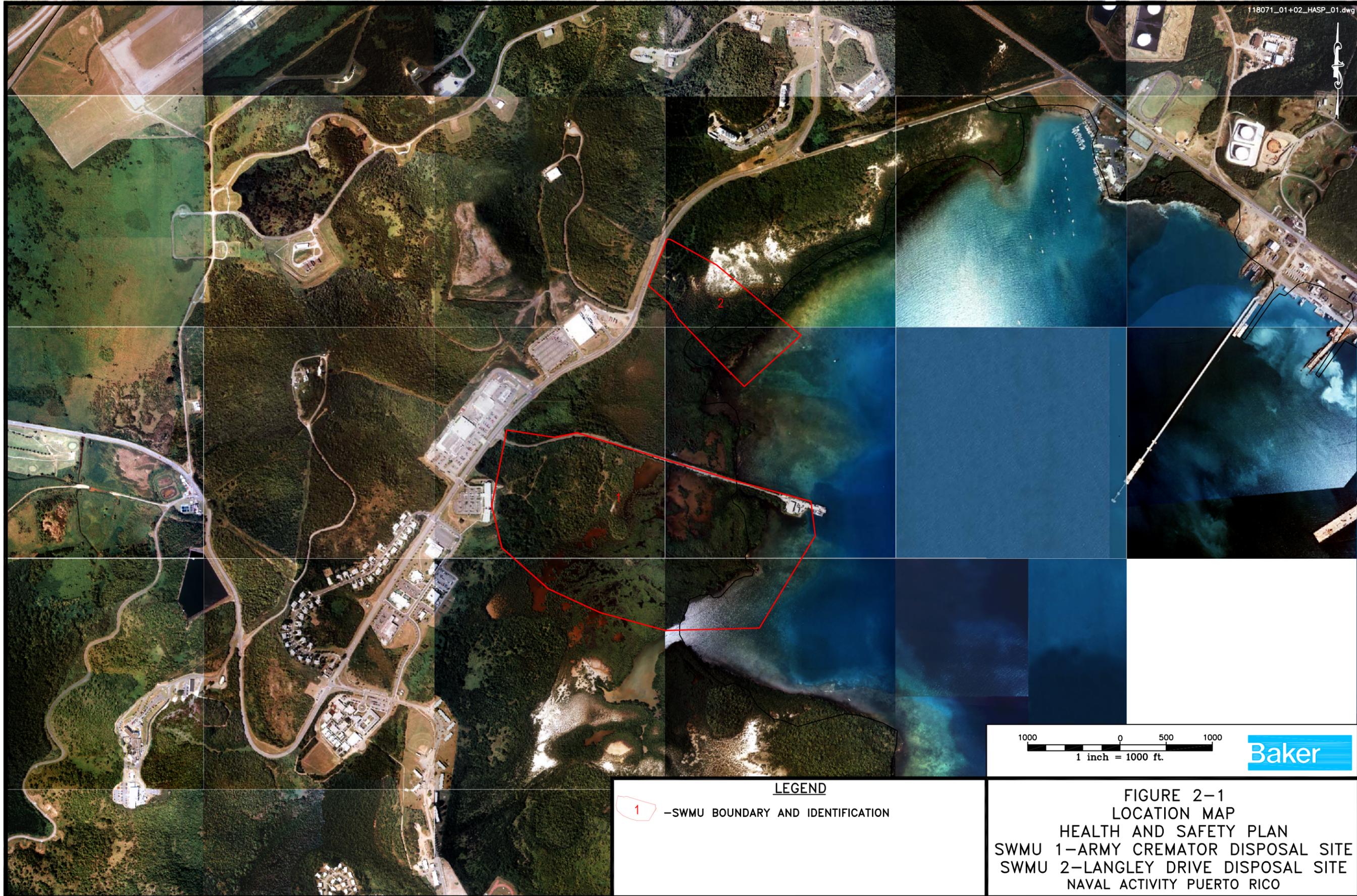
Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute for Occupational Safety and Health (NIOSH), OSHA, U.S. Coast Guard (USCG), EPA (86-116, November 1985).

Title 29 of the Code of Federal Regulations (CFR), Part 1910.

Title 29 of the CFR, Part 1926.

United States Army Corps of Engineers (USACE) Safety and Health Requirements Manual EM 385-1-1.

FIGURES



LEGEND

1 -SWMU BOUNDARY AND IDENTIFICATION

1000 0 500 1000
1 inch = 1000 ft.



FIGURE 2-1
LOCATION MAP
 HEALTH AND SAFETY PLAN
 SWMU 1-ARMY CREMATOR DISPOSAL SITE
 SWMU 2-LANGLEY DRIVE DISPOSAL SITE
 NAVAL ACTIVITY PUERTO RICO

APPENDIX A
MATERIAL SAFETY DATA SHEETS



7419760-00 BEACON 325
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: BEACON 325
SUPPLIER: EXXON MOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency (Primary) CHEMTREC: 800-424-9300
(Secondary) 281-834-3296

Product and Technical Information: 800-443-9966
MSDS Fax on Demand: 613-228-1467, other MSDS information: 856-224-4644

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: BASE OIL AND ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

None.

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Smooth, Tan Grease. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing.

Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): 213(415) (ESTIMATED FOR OIL, ASTM D-92 (COC)).

Flammable Limits (approx.% vol.in air) - LEL: NE, UEL: NE

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers,

water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

This product does not contain any components which have recognized exposure limits.

VENTILATION: Use adequate ventilation.

RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.

EYE PROTECTION: Generally eye contact is unlikely with this type material. If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: If prolonged or repeated skin contact is likely, oil impervious gloves should be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Grease

COLOR: Smooth, Tan

ODOR: Mild

ODOR THRESHOLD-ppm: NE

pH: NA

BOILING POINT C(F): > 260(500)

DROP POINT C(F): NE
FLASH POINT C(F): 213(415) (ESTIMATED FOR OIL, ASTM D-92 (COC))
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.94
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: > 3200.0
VISCOSITY AT 100 C, cSt: NE
POUR POINT C(F): NA
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral oils and synthetic base oils, such as those in this product have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS: This product is expected to be inherently biodegradable, as the principal components have been shown to degrade at slow to moderate rates. The major components in the formulation show no aquatic toxicity at 1000 mg/L loading, therefore long-term adverse effects in the aquatic environment are not expected.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous

characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains no chemicals subject to the supplier notification requirements of SARA (313) toxic release program.

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
NAPHTHENIC ACIDS, ZINC SALTS (0.02%)	12001-85-3	22

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK

4=NTP CARC 9=OSHA CARC 14=TSCA 6 19=FL RTK 24=NJ RTK
5=NTP SUS 10=OSHA Z 15=TSCA 12b 20=IL RTK 25=PA RTK
26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: GREASE

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN:
7419760-00, CMCS97: 97R014, REQ: PS+C, SAFE USE: L
EHS Approval Date: 07OCT2001

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MATERIAL SAFETY DATA SHEET

SECTION 1	PRODUCT AND COMPANY IDENTIFICATION
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PRODUCT

Product Name: GASOLINE, UNLEADED AUTOMOTIVE

Product Description: Hydrocarbons and Additives

Product Code: 123455-20, 9700, 977032, 977217, 977306, 977360, 977371, 977381, 977445, 977562, 977767, 977920, 979533, 97A039, 97A065, 97A078, 97A087, 97A102, 97A108, 97A146, 97A147, 97A152, 97A193, 97A200, 97A240, 97A266, 97A273, 97A290, 97A305, 97A316, 97A317, 97A328, 97A347, 97A380, 97A404, 97A424, 97A431, 97A441, 97A514, 97A556, 97A557, 97A613, 97A634, 97A653, 97A655, 97A659, 97A686, 97A696, 97A703, 97A712, 97A726, 97A736, 97A746, 97A767, 97A794, 97A798, 97A827, 97A848, 97A851, 97A876, 97A883, 97A907, 97A934, 97A948, 97A949, 97A960, 97A983, 97A989, 97AV99, 97AW00, 97AW01, 97AW38, 97AZ87, 97AZ88, 97AZ89, 97AZ90, 97AZ91, 97AZ92, 97AZ93, 97AZ94, 97AZ95, 97AZ96, 97AZ97, 97AZ98, 97AZ99, 97BA11, 97BA12, 97BA13, 97BA14, 97BA15, 97BA16, 97BA67, 97BA68, 97BA69, 97BA70, 97BE24, 97BE25, 97BE26, 97BE27, 97BE28, 97BE29, 97BE30, 97BE31, 97BE32, 97BE33, 97BE34, 97BE35, 97BE36, 97BE37, 97BE38, 97BE39, 97BN13, 97BN50, 97C070, 97C072, 97C075, 97C110, 97C112, 97C113, 97C118, 97C127, 97C140, 97C148, 97C166, 97C417, 97C558, 97C576, 97C632, 97C702, 97C731, 97C759, 97C770, 97C782, 97C794, 97C870, 97C917, 97D130, 97D228, 97E002, 97E010, 97E041, 97E065, 97E087, 97E103, 97E104, 97E11, 97E112, 97E113, 97E170, 97E171, 97E196, 97E197, 97E259, 97E260, 97E304, 97E305, 97E347, 97E42, 97E532, 97E564, 97E581, 97E595, 97E606, 97E611, 97E619, 97E649, 97E655, 97E66, 97E682, 97E749, 97E860, 97E88, 97E999, 97F005, 97F020, 97F030, 97F054, 97F312, 97F344, 97F952, 97M190, 97M191, 97M192, 97M193, 97M194, 97M195, 97M229, 97M230, 97M232, 97N832, 97N844, 97N848, 97N861, 97N873, 97N877, 97N879, 97N891, 97N895, 97N913, 97N917, 97N921, 97N941, 97N942, 97N954, 97Q303, 97Q763, 97Q781, 97Q782, 97R368, 97S760, 97U927, 97V321, 97V323, 97V325, 97V326, 97X861, EMGF20

Intended Use: Fuel, Gasoline

COMPANY IDENTIFICATION

Supplier: EXXON MOBIL CORPORATION
 3225 GALLOWS RD.
 FAIRFAX, VA. 22037 USA

24 Hour Health Emergency 609-737-4411
Transportation Emergency Phone 800-424-9300
ExxonMobil Transportation No. 281-834-3296
Product Technical Information 800-662-4525, 800-947-9147
MSDS Internet Address <http://www.exxon.com>, <http://www.mobil.com>

SECTION 2	COMPOSITION / INFORMATION ON INGREDIENTS
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Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
ETHYL ALCOHOL	64-17-5	< 11%
Gasoline	86290-81-5	89 - 100%

Hazardous Constituent(s) Contained in Complex Substance(s)

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Name	CAS#	Concentration*
BENZENE	71-43-2	0.1 - 5%
ETHYL BENZENE	100-41-4	1 - 5%
N-HEXANE	110-54-3	1 - 5%
NAPHTHALENE	91-20-3	<1%
PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)	95-63-6	1 - 5%
Toluene	108-88-3	5 - 10%
TRIMETHYL BENZENE	25551-13-7	1 - 5%
XYLENES	1330-20-7	5 - 10%

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

NOTE: The concentration of the components shown above may vary substantially. In certain countries, benzene content may be limited to lower levels. Oxygenates such as tertiary-amyl-methyl ether, ethanol, di-isopropyl ether, and ethyl-tertiary-butyl ether may be present. Because of volatility considerations, gasoline vapor may have concentrations of components very different from those of liquid gasoline. The major components of gasoline vapor are: butane, isobutane, pentane, and isopentane. The reportable component percentages, shown in the composition/information on ingredients section, are based on API's evaluation of a typical gasoline mixture.

SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL PHYSICAL / CHEMICAL EFFECTS

Extremely flammable. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an incendiary electrical discharge.

POTENTIAL HEALTH EFFECTS

Irritating to skin. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat, and lungs. May cause central nervous system depression. High-pressure injection under skin may cause serious damage. Prolonged and repeated exposure to benzene may cause serious injury to blood forming organs and is associated with anemia and to the later development of acute myelogenous leukemia (AML).

Target Organs: Lung | Skin |

ENVIRONMENTAL HAZARDS

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

NFPA Hazard ID:	Health: 1	Flammability: 3	Reactivity: 0
HMIS Hazard ID:	Health: 1*	Flammability: 3	Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

Inhalation

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek

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immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Benzene- Individuals with liver disease may be more susceptible to toxic effects.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop a leak. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Extremely Flammable. Vapors are flammable and heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulfur Oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: <-40C (-40F) [ASTM D-56]

Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.6

Autoignition Temperature: >250°C (482°F)

SECTION 6 ACCIDENTAL RELEASE MEASURES

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Notification Procedures

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces. Recover by pumping or with suitable absorbent.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7

HANDLING AND STORAGE

HANDLING

Avoid breathing mists or vapors. Avoid contact with skin. Use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapors may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Use proper bonding and/or grounding procedures. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. It is dangerous and/or unlawful to put fuel into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapors and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source).

Static Accumulator: This material is a static accumulator.

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STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be grounded and bonded. Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.

SECTION 8	EXPOSURE CONTROLS / PERSONAL PROTECTION
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EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Source	Form	Limit / Standard		NOTE	Source
BENZENE		OSHA Action level	0.5 ppm		N/A OSHA Sp.Reg.
BENZENE		STEL	5 ppm		N/A OSHA Sp.Reg.
BENZENE		TWA	1 ppm		N/A OSHA Sp.Reg.
BENZENE		STEL	2.5 ppm	Skin	ACGIH
BENZENE		TWA	0.5 ppm	Skin	ACGIH
ETHYL ALCOHOL		TWA	1900 mg/m ³	1000 ppm	N/A OSHA Z1
ETHYL ALCOHOL		STEL	1000 ppm		N/A ACGIH
ETHYL BENZENE		TWA	435 mg/m ³	100 ppm	N/A OSHA Z1
ETHYL BENZENE		STEL	125 ppm		N/A ACGIH
ETHYL BENZENE		TWA	100 ppm		N/A ACGIH
Gasoline		STEL	200 ppm		N/A ExxonMobil
Gasoline		TWA	100 ppm		N/A ExxonMobil
Gasoline		STEL	500 ppm		N/A ACGIH
Gasoline		TWA	300 ppm		N/A ACGIH
N-HEXANE		TWA	1800 mg/m ³	500 ppm	N/A OSHA Z1
N-HEXANE		TWA	50 ppm		Skin ACGIH
NAPHTHALENE		TWA	50 mg/m ³	10 ppm	N/A OSHA Z1
NAPHTHALENE		STEL	15 ppm		Skin ACGIH
NAPHTHALENE		TWA	10 ppm		Skin ACGIH
PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)		TWA	25 ppm		N/A ACGIH
Toluene		Ceiling	300 ppm		N/A OSHA Z2
Toluene		Maximum concentration	500 ppm		N/A OSHA Z2
Toluene		TWA	200 ppm		N/A OSHA Z2
Toluene		TWA	20 ppm		N/A ACGIH
TRIMETHYL BENZENE		TWA	25 ppm		N/A ACGIH
XYLENES		TWA	435 mg/m ³	100 ppm	N/A OSHA Z1
XYLENES		STEL	150 ppm		N/A ACGIH
XYLENES		TWA	100 ppm		N/A ACGIH

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NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

Personal Protection

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

If prolonged or repeated contact is likely, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9

PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional

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data.

GENERAL INFORMATION

Physical State: Liquid
Color: Clear (May Be Dyed)
Odor: Petroleum/Solvent
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.74
Flash Point [Method]: <-40C (-40F) [ASTM D-56]
Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.6
Autoignition Temperature: >250°C (482°F)
Boiling Point / Range: > 20C (68F)
Vapor Density (Air = 1): 3 at 101 kPa
Vapor Pressure: > 26.6 kPa (200 mm Hg) at 20 C
Evaporation Rate (N-Butyl Acetate = 1): > 10
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3
Solubility in Water: Negligible
Viscosity: <1 cSt (1 mm²/sec) at 40 C
Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A

SECTION 10	STABILITY AND REACTIVITY
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STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Halogens, Strong Acids, Alkalies, Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11	TOXICOLOGICAL INFORMATION
-------------------	----------------------------------

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m ³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar

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	materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Moderately irritating to skin with prolonged exposure. Based on test data for structurally similar materials.
Eye	
Irritation: Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Laboratory animal studies have shown that prolonged and repeated inhalation exposure to light hydrocarbon vapors in the same boiling range as this product can produce adverse kidney effects in male rats. However, these effects were not observed in similar studies with female rats, male and female mice, or in limited studies with other animal species. Additionally, in a number of human studies, there was no clinical evidence of such effects at normal occupational levels. In 1991, The U.S. EPA determined that the male rat kidney is not useful for assessing human risk.

Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Gasoline unleaded: Caused cancer in animal tests. Chronic inhalation studies resulted in liver tumors in female mice and kidney tumors in male rats. Neither result considered significant for human health risk assessment by the United States EPA and others. Did not cause mutations In Vitro or In Vivo. Negative in inhalation developmental studies and reproductive tox studies. Inhalation of high concentrations in animals resulted in reversible central nervous system depression, but no persistent toxic effect on the nervous system. Non-sensitizing in test animals. Caused nerve damage in humans from abusive use (sniffing).

Contains:

BENZENE: Caused cancer (leukemia), damage to the blood-producing system, and serious blood disorders from prolonged, high exposure based on human epidemiology studies. Caused genetic effects and effects on the immune system in laboratory animal and some human studies. Caused toxicity to the fetus in laboratory animal studies.

ETHANOL: Prolonged or repeated exposure to high concentrations of ethanol vapor or overexposure by ingestion may produce adverse effects to brain, kidney, liver, and reproductive organs, birth defects in offspring, and developmental toxicity in offspring.

NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

N-HEXANE: Prolonged and/or repeated exposures to n-Hexane can cause progressive and potentially irreversible damage to the peripheral nervous system (e.g. fingers, feet, arms, legs, etc.). Simultaneous exposure to Methyl Ethyl Ketone (MEK) or Methyl Isobutyl Ketone (MIBK) and n-Hexane can potentiate the risk of adverse effects from n-Hexane on the peripheral nervous system. n-Hexane has been shown to cause testicular damage at high doses in male rats. The relevance of this effect for humans is unknown.

TOLUENE : Concentrated, prolonged or deliberate inhalation may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals (> 1500 ppm) have been reported to cause adverse fetal developmental effects.

TRIMETHYLBENZENE: Long-term inhalation exposure of trimethylbenzene caused effects to the blood in laboratory animals.

ETHYLBENZENE: Caused cancer in laboratory animal studies. The relevance of these findings to humans is

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uncertain.

Additional information is available by request.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
BENZENE	71-43-2	1, 3, 6
ETHYL BENZENE	100-41-4	5
Gasoline	86290-81-5	5
NAPHTHALENE	91-20-3	2, 5

--REGULATORY LISTS SEARCHED--

1 = NTP CARC

2 = NTP SUS

3 = IARC 1

4 = IARC 2A

5 = IARC 2B

6 = OSHA CARC

SECTION 12

ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Majority of components -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13

DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

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Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP). Potential RCRA characteristics: IGNITABILITY. TCLP (BENZENE)

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14	TRANSPORT INFORMATION
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LAND (DOT)

Proper Shipping Name: Gasoline
Hazard Class & Division: 3
ID Number: 1203
Packing Group: II
Marine Pollutant: MP: 100 %weight PP: 0 %weight
ERG Number: 128
Label(s): 3
Transport Document Name: UN1203, GASOLINE, 3, PG II, MARINE POLLUTANT

LAND (TDG)

Proper Shipping Name: Gasoline
Hazard Class & Division: 3
UN Number: 1203
Packing Group: II
Special Provisions: 17

SEA (IMDG)

Proper Shipping Name: MOTOR SPIRIT or GASOLINE or PETROL
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1203
Packing Group: II
Marine Pollutant: Yes
Label(s): 3
Transport Document Name: UN1203, MOTOR SPIRIT or GASOLINE or PETROL, 3, PG II, (-40°C c.c.), MARINE POLLUTANT

AIR (IATA)

Proper Shipping Name: Gasoline
Hazard Class & Division: 3
UN Number: 1203
Packing Group: II

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Label(s) / Mark(s): 3

Transport Document Name: UN1203, GASOLINE, 3, PG II

SECTION 15	REGULATORY INFORMATION
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OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purpose, this material is classified as hazardous in accordance with OSHA 29CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, DSL, EINECS, ENCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

CERCLA: This material is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Contact local authorities to determine if other reporting requirements apply.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: Fire. Immediate Health. Delayed Health.

SARA (313) TOXIC RELEASE INVENTORY:

Chemical Name	CAS Number	Typical Value
ETHYL BENZENE	100-41-4	1 - 5%
N-HEXANE	110-54-3	1 - 5%
NAPHTHALENE	91-20-3	<1%
Toluene	108-88-3	5 - 10%
XYLENES	1330-20-7	5 - 10%
PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)	95-63-6	1 - 5%
BENZENE	71-43-2	0.1 - 5%

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
BENZENE	71-43-2	1, 2, 4, 10, 11, 13, 15, 16, 17, 18, 19
ETHYL ALCOHOL	64-17-5	1, 4, 13, 17, 18, 19
ETHYL BENZENE	100-41-4	1, 4, 10, 13, 16, 17, 18, 19
Gasoline	86290-81-5	1, 17, 18
N-HEXANE	110-54-3	1, 4, 13, 16, 17, 18, 19
NAPHTHALENE	91-20-3	1, 4, 5, 9, 10
PSEUDOCUMENE (1,2,4-TRIMETHYLBENZENE)	95-63-6	1, 13, 16, 17, 18, 19
Toluene	108-88-3	1, 4, 11, 13, 15, 16, 17, 18, 19
TRIMETHYL BENZENE	25551-13-7	1, 13, 16, 17, 18, 19
XYLENES	1330-20-7	1, 4, 5, 9, 13, 15, 17, 18, 19

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL

6 = TSCA 5a2

11 = CA P65 REPRO

16 = MN RTK

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2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

- Section 04: First Aid Inhalation - Header was modified.
- Section 04: First Aid Ingestion - Header was modified.
- Section 06: Notification Procedures - Header was modified.
- Section 01: Product Code was modified.
- Section 10 Stability and Reactivity - Header was modified.
- Section 13: Disposal Recommendations - Note was modified.
- Section 09: Evaporation Rate - Header was modified.
- Section 08: Personal Protection - Header was modified.
- Section 08: Personal Protection was modified.
- Section 11: Inhalation Lethality Test Data was modified.
- Section 05: Hazardous Combustion Products was modified.
- Section 09: Relative Density - Header was modified.
- Section 09: Viscosity was modified.
- Section 14: Transport Document Name was modified.
- Section 14: Proper Shipping Name was modified.
- Section 14: Label(s) - Header was modified.
- Section 14: Proper Shipping Name was modified.
- Section 14: Proper Shipping Name was modified.
- Section 14: Transport Document Name was modified.
- Composition: Component Table was modified.
- Section 15: List Citations Table was modified.
- Section 11: Tox List Cited Table was modified.
- Section 15: List Citation Table - Header was modified.
- Section 15: SARA (313) TOXIC RELEASE INVENTORY - Table was modified.
- Section 16: Materials Covered was modified.
- Composition: Component Table was modified.
- Section 16: Precautions - Header was modified.
- Section 16: NA Contains was modified.
- Section 08: Exposure Limits Table was modified.
- Section 08: OEL Table - Notation Column - Header was modified.
- Section 08: Exposure Limit Values - Header was modified.
- Section 14: Marine Pollutant - Header was added.
- Section 14: Marine Pollutant was added.
- Section 14: Marine Pollutant - Header was added.
- Section 14: Marine Pollutant was added.
- Section 08: Exposure limits/standards was deleted.

THIS MSDS COVERS THE FOLLOWING MATERIALS: ESSO EXTRA MIDGRADE UNLEADED | ESSO MIDGRADE UNLEADED | ESSO PREMIUM UNLEADED | ESSO REGULAR UNLEADED | ESSO SUPER PREMIUM UNLEADED | EXXON MIDGRADE UNLEADED | EXXON PREMIUM UNLEADED | EXXON

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REGULAR UNLEADED | Gasoline | INDOLINE GASOLINE | MIDGRADE UNLEADED | MOBIL EXTRA UNLEADED | MOBIL REGULAR UNLEADED | MOBIL SPECIAL UNLEADED | MOBIL SUPER UNLEADED | PREMIUM UNLEADED | REGULAR UNLEADED | UNLEADED GASOLINE

PRECAUTIONARY LABEL TEXT:

Contains: BENZENE, Gasoline

DANGER!

HEALTH HAZARDS

Irritating to skin. If swallowed, may be aspirated and cause lung damage. Prolonged and repeated exposure to benzene may cause serious injury to blood forming organs and is associated with anemia and to the later development of acute myelogenous leukemia (AML).

Target Organs: Lung | Skin |

PHYSICAL HAZARDS

Extremely flammable. Material can accumulate static charges which may cause an incendiary electrical discharge. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited.

Precautions

Avoid breathing mists or vapors. Avoid contact with skin. Use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapors may be evolved from heated or agitated material. Do not siphon by mouth. Use only with adequate ventilation. Use proper bonding and/or grounding procedures.

FIRST AID

Inhalation: Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Eye: Flush thoroughly with water. If irritation occurs, get medical assistance.

Oral: Seek immediate medical attention. Do not induce vomiting.

Skin: Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

FIRE FIGHTING MEDIA

Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

SPILL/LEAK

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Recover by pumping or with suitable absorbent.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.



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This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product.

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Internal Use Only

MHC: 1A, 0, 0, 0, 3, 1

PPEC: CF

DGN: 2000316XUS (1011203)

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7212211-00 2211 DIESEL LUBRICATING OIL
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 2211 DIESEL LUBRICATING OIL
SUPPLIER: EXXON MOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency (Primary) CHEMTREC: 800-424-9300
(Secondary) 281-834-3296

Product and Technical Information:

Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: <http://www.exxon.com>, <http://www.mobil.com>

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: BASE OIL AND ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

None.

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Clear Orange Liquid. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area. (See Section 16 - Injection Injury)

INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing.

Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): 227(440) (ASTM D-92).

Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

When mists/aerosols can occur, the following are recommended: 5 mg/m³ (as oil mist)- ACGIH Threshold Limit Value (TLV), 10 mg/m³ (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m³ (as oil mist) - OSHA Permissible Exposure Limit (PEL)

VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.

RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: Not normally required. When splashing or liquid contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid

COLOR: Clear Orange
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 329(625)
MELTING POINT C(F): NA
FLASH POINT C(F): 227(440) (ASTM D-92)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: NE
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.92
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 205.0
VISCOSITY AT 100 C, cSt: 14.7
POUR POINT C(F): < -12(10)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not

performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---OTHER TOXICOLOGY DATA---

Used gasoline engine oils have shown evidence of skin carcinogenic activity in laboratory tests when no effort was made to wash the oil off between applications. Used oil from diesel engines did not produce this effect.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative products.

ECOTOXICITY: Available ectotoxicity data (LL50 >1000 mg/L) indicates

that adverse effects to aquatic organisms are not expected from this product.

MOBILITY: When released into the environment, adsorption to sediment and soil will be the predominant behavior.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable.

BIOACCUMULATIVE POTENTIAL: Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

STATIC ACCUMULATOR (50 picosiemens or less): YES

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains no chemicals subject to the supplier notification requirements of SARA (313) toxic release program.

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
CHLORINE (ELEMENTAL ANALYSIS) (0.24%)	7782-50-5	22
CHLORO ALKANES (0.61%)	61788-76-9	22

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.

Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: COMMERCIAL ENGINE OIL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin,

or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN:
7212211-00, CMCS97: 97P275, REQ: PS+C, SAFE USE: L
EHS Approval Date: 25OCT2001

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Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

As of the revision date above, this (M)SDS meets the regulations in the United Kingdom & Ireland.

PRODUCT

Product Name: ESSO DIESEL
Product Description: Hydrocarbons and Additives
Product Code: 708110-60
Intended Use: Diesel engine fuel

COMPANY IDENTIFICATION

Supplier: Esso Petroleum Company, Limited
ExxonMobil House
Ermyrn Way
KT22 8UX Leatherhead, Surrey
United Kingdom

24 Hour Environmental / Health Emergency Telephone e-mail 01372 222 000 (UK) / +44 1372 222 000 (Ireland)
SDS-UK@EXXONMOBIL.COM

SECTION 2 HAZARDS IDENTIFICATION

This material is dangerous according to regulatory guidelines (see (M)SDS Section 15).

CLASSIFICATION: | Carc. Cat. 3; R40 | Xn; R65 | R66 | N; R51/53 |

PHYSICAL / CHEMICAL HAZARDS

Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an incendiary electrical discharge.

HEALTH HAZARDS

Limited evidence of a carcinogenic effect. Harmful: may cause lung damage if swallowed. Repeated exposure may cause skin dryness or cracking. Under conditions of poor personal hygiene and prolonged repeated contact, some polycyclic aromatic compounds (PACs) have been suspected as a cause of skin cancer in humans. May be irritating to the eyes, nose, throat, and lungs. May cause central nervous system depression. High-pressure injection under skin may cause serious damage.

ENVIRONMENTAL HAZARDS

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Note: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is regulated as a preparation.

Product Name: ESSO DIESEL

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Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	EINECS / ELINCS	Concentration *	Symbols/Risk Phrases
Fuels, diesel, no. 2	68476-34-6	270-676-1	> 94%	Xn;Carc. Cat. 3;R40, Xn;R65, R66, N;R51/53

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Note: Composition may contain up to 0.5% performance additives and / or dyes. FAME (fatty acid methyl ester) may be present up to 5% - the maximum permitted by European Standard EN 590

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Remove contaminated clothing. Dry wipe exposed skin and cleanse with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further skin contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Hydrocarbon Solvents/Petroleum Hydrocarbons- Skin contact may aggravate an existing dermatitis.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

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FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Aldehydes, Sulphur Oxides, Smoke, Fume, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >56C (133F) [ASTM D-93]

Flammable Limits (Approximate volume % in air): LEL: 0.6 UEL: 7.0

Autoignition Temperature: >250°C (482°F)

SECTION 6

ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

Water Spill: Stop leak if you can do so without risk. Eliminate sources of ignition. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7

HANDLING AND STORAGE

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HANDLING

Avoid all personal contact. Use proper bonding and/or earthing procedures. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices etc) in or around any fuelling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Do not siphon by mouth. Material can accumulate static charges which may cause an electrical spark (ignition source).

Static Accumulator: This material is a static accumulator.

STORAGE

Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be earthed and bonded. Drums must be earthed and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.

SECTION 8

EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit/Standard			Note	Source	Year
Fuels, diesel, no. 2	Stable Aerosol.	TWA	5 mg/m ³			ExxonMobil	2007
Fuels, diesel, no. 2	Vapour.	TWA	200 mg/m ³			ExxonMobil	2007

Note: Information about recommended monitoring procedures can be obtained from the relevant agency(ies)/institute(s):

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode.

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Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly affect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Chemical resistant gloves are recommended. If contact with forearms is likely wear gauntlet style gloves. CEN standards EN 420 and EN 374 provide general requirements and lists of glove types.

Eye Protection: If contact with material is likely, chemical goggles are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Chemical/oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9

PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid

Colour: Light Colored

Odour: Petroleum/solvent

Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.85

Flash Point [Method]: >56C (133F) [ASTM D-93]

Flammable Limits (Approximate volume % in air): LEL: 0.6 UEL: 7.0

Autoignition Temperature: >250°C (482°F)

Boiling Point / Range: > 180C (356F)

Vapour Density (Air = 1): > 2 at 101 kPa

Vapour Pressure: < 0.04 kPa (0.3 mm Hg) at 20°C

Evaporation Rate (N-Butyl Acetate = 1): N/D

pH: N/D

Log Pow (n-Octanol/Water Partition Coefficient): > 3.5

Solubility in Water: Negligible

Viscosity: 2 cSt (2 mm²/sec) at 40°C - 4 cSt (4 mm²/sec) at 40°C

Oxidising properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D

Melting Point: N/A

SECTION 10	STABILITY AND REACTIVITY
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STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Open flames and high energy ignition sources.

MATERIALS TO AVOID: Halogens, Strong Acids, Strong Bases, Strong oxidisers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11	TOXICOLOGICAL INFORMATION
-------------------	----------------------------------

Acute Toxicity

<u>Route of Exposure</u>	<u>Conclusion / Remarks</u>
INHALATION	
Toxicity: LC50 > 5000 mg/m ³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: Data available.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on test data for structurally similar materials.
INGESTION	
Toxicity: LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity: LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: Data available.	May dry the skin leading to discomfort and dermatitis. Based on test data for structurally similar materials.
Eye	
Irritation: Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Diesel fuel: Carcinogenic in animal tests. Caused mutations in-vitro. Repeated dermal exposures to high concentrations in test animals resulted in reduced litter size and litter weight, and increased fetal resorptions at maternally toxic doses. Dermal exposure to high concentrations resulted in severe skin irritation with weight loss and some mortality. Inhalation exposure to high concentrations resulted in respiratory tract irritation, lung changes/infiltration/accumulation, and reduction in lung function. Diesel exhaust fumes: Carcinogenic in animal tests. Inhalation exposures to exhaust for 2 years in test animals resulted in lung tumours and lymphoma. Extract of particulate produced skin tumours in test animals. Caused mutations in-vitro.

Additional information is available by request.

SECTION 12	ECOLOGICAL INFORMATION
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The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

High molecular wt. component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

SECTION 13	DISPOSAL CONSIDERATIONS
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Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

European Waste Code: 13 07 01

NOTE: These codes are assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste producers need to assess the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code(s).

This material is considered as hazardous waste pursuant to Directive 91/689/EEC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken

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for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14

TRANSPORT INFORMATION

LAND (ADR/RID)

Proper Shipping Name: GAS OIL
Proper Shipping Name Suffix: Special Provision 640L
Hazard Class: 3
Classification Code: F1
UN Number: 1202
Packing Group: III
Label(s) / Mark(s): 3
Hazard ID Number: 30
CEFIC Tremcard: 30S1202
Hazchem EAC: 3Y
Transport Document Name: UN1202, GAS OIL, 3, PG III

INLAND WATERWAYS (ADNR)

Proper Shipping Name: GAS OIL
Hazard Class: 3
Hazard ID Number: 30
UN or ID Number: 1202
Packing Group: III
Label(s) / Mark(s): 3
Transport Document Name: UN1202, GAS OIL, 3, PG III

SEA (IMDG)

Proper Shipping Name: GAS OIL
Hazard Class & Division: 3
UN Number: 1202
Packing Group: III
Label(s): 3
EMS Number: F-E, S-E
Transport Document Name: UN1202, GAS OIL, 3, PG III, (56°C c.c.)

AIR (IATA)

Proper Shipping Name: GAS OIL
Hazard Class & Division: 3
UN Number: 1202
Packing Group: III
Label(s): 3
Transport Document Name: UN1202, GAS OIL, 3, PG III

SECTION 15

REGULATORY INFORMATION

Material is dangerous as defined by the EU Dangerous Substances/Preparations Directives.

CLASSIFICATION: Category 3 Carcinogen. Harmful. Dangerous for the environment.

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EU LABELING:

Symbol: Xn, N



Harmful.



Dangerous for the environment.

Nature of Special Risk: R40; Limited evidence of a carcinogenic effect. R65; Harmful: may cause lung damage if swallowed. R66; Repeated exposure may cause skin dryness or cracking. R51/53; Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Advice: S2; Keep out of the reach of children. S36/37; Wear suitable protective clothing and gloves. S61; Avoid release to the environment. Refer to special instructions/safety data sheets. S62; If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Contains: Fuels, diesel, no. 2

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Complies with the following national/regional chemical inventory requirements: EINECS, TSCA, ENCS

Applicable EU Directives and Regulations:

EU Directive:

- 92/85/EEC [...pregnant workers...recently given birth or...breastfeeding directive]
- 94/33/EC [...on the protection of young people at work]

SECTION 16

OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE RISK CODES CONTAINED IN SECTION 2 AND 3 OF THIS DOCUMENT (for information only):

- R40; Limited evidence of a carcinogenic effect.
- R51/53; Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- R65; Harmful: may cause lung damage if swallowed.
- R66; Repeated exposure may cause skin dryness or cracking.

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

No revision information is available.

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Internal Use Only

MHC: 1A, 0, 0, 0, 1, 1

PPEC: C

DGN: 7081439XGB (1012120)

APPENDIX B
ACTIVITY HAZARD ANALYSIS

1.0 ACTIVITY HAZARD ANALYSIS

Activity Hazard Analyses (AHA) identify potential safety, health, and environmental hazards associated with specific tasks and provide protective measures for personnel, the community, and the environment.

Activity Hazard Analyses have been developed for the major tasks to be performed for this project. The names of the competent/qualified person(s) required for a particular activity (i.e., excavations, fall protection, and other activities) as specified by OSHA, will be identified and included in the AHA. The AHA shall be reviewed and modified by the Construction Site Manager or SSO (with input from subcontracted field employees). Activity Hazard Analyses shall be reviewed and modified, as necessary, to address changing site conditions, operations, or changes of competent/qualified person(s). Activity Hazard Analyses shall also be reviewed and modified during the daily tailgate safety meetings and Job Safety Analysis (JSA) meetings. Modifications will be handwritten in ink on the specific AHA. If more than one competent/qualified person will be used on the AHA, a list of names will be included as an attachment to the AHA. Those listed shall be competent and qualified for the type of work involved and familiar with current site safety issues. If a new competent/qualified person (not on the original list) is added, the list shall be updated (this is an administrative action not requiring an updated AHA). The new worker shall acknowledge, in writing that he/she has reviewed the AHA and is familiar with current site safety issues. Work will not proceed on a particular task or phase until the AHA has been discussed with the work crews. Additions or changes to this HASP must be attached as a HASP Amendment. Any amendment to this HASP must have written approval from the RWEC Program HSM.

Each day, the crews must complete a JSA for each task that will be accomplished, as required by RWEC Procedures, "Job Safety Analysis (JSA)" (Current Revision). The JSA shall be revised, as necessary, when unforeseen circumstances arise or work-site conditions change. Any revisions shall be immediately communicated with the affected site workers. If the need to complete an unplanned task becomes necessary at any point throughout the day, then a new JSA shall be prepared to cover that task.

2.0 PROJECT HAZARDS AND HAZARD CONTROL MEASURES

There are potential chemical, physical, and environmental hazards present at the project sites. The hazards, if not properly controlled, could cause harm to project personnel, visitors, and the public. The anticipated hazards at the project sites and the recommended control measures are presented in this section.

2.1 Chemical Hazards

There are no chemical hazards associated with this project not covered under the OSHA Hazard Communication standard.

2.1.1 Operational Chemicals/Hazard Communication Program

Hazardous chemicals will be brought to project sites for use in activities supporting the planned work. These chemicals are used as fuels, oxidizers, solvents, cements, cleaning solutions, paints, etc. The use of operational chemicals is regulated by OSHA under the Hazard Communication Standard (29 CFR 1910.1200). A written hazard communication program has been established and includes the following elements:

- ***Container Labeling***—Project personnel will ensure that all containers are labeled according to their contents. This requirement will apply to containers from manufacturers and those produced on site by operations. The labels on all incoming and outgoing containers will be checked for identity, hazard warning, and the name and address of the responsible party.
- ***Material Data Safety Sheets***—MSDSs will be provided on site for each hazardous chemical used or known to be present at the site.
- ***Employee Information and Training***—Employees will receive annual chemical hazard safety training, supplemented by informal daily safety meetings. Project specific chemical hazards will be communicated to employees through an initial site orientation meeting and daily safety meetings.

The written hazard communication program will be available at the project site for personnel review and provides requirements for the safe use of operational chemicals. Proper ventilation and personal protective equipment (PPE) shall be used when working with operational chemicals. Air monitoring may be performed as needed to assess and control exposures resulting from the use of operational chemicals. Both an inventory list of the operational chemicals (Hazardous Chemical Inventory List) used and a Material Safety Data Sheets (MSDS) for operational chemicals shall be made available at each project site.

2.2 Munitions and Explosives of Concern

There is very little potential for Munitions and Explosives of Concern (MEC) to be encountered during project activities.

2.3 Radiological Hazards

There is very little potential for radiological hazards to be encountered during project activities.

2.4 Physical Hazards

There will be numerous physical hazards associated with site operations that require consideration. Some of these physical hazards are as follows:

- Noise
- Slips, trips, and falls
- Fires, explosions, and hot work
- Use of ladders and scaffolding
- Use of small tools
- Use of mechanized equipment
- Operation of motor vehicles
- Material handling
- Hazardous energies (i.e., electrical, mechanical, and pressure)
- Intrusive Activities
- Excavation
- Confined space entry
- Dust
- Excessive Work Hours

2.4.1 Noise and Hearing Conservation

There will be many sources of noise at this project site. Noise may be generated from the use of equipment and tools. Hearing loss, resulting from occupational exposure to noise, can be prevented. RWEC, Inc. procedures, "Hearing Conservation Program" (Current Revision) shall be implemented at each project site whenever there is employee noise exposures equal to or exceeding an eight-hour TWA of 85 dBA (decibels, A-scale). As part of the criteria for a hearing conservation program, audiometric testing of personnel must be conducted annually. The SSO shall conduct noise surveys as necessary to determine if engineering controls should be implemented and/or if hearing protection is adequate. Personnel shall wear hearing protection when working with or around equipment, power tools, as noise monitoring indicates, or in areas posted as such. Warning signs shall be posted in areas where noise (greater than 85 decibels) necessitates the use of hearing protection.

2.4.2 Slips, Trips, and Falls

The following details procedures to prevent slips, trips, and falls:

- Personnel shall keep working areas clean and orderly. Tools, equipment, and materials shall be used and stored in a fashion to minimize tripping hazards.
- Small objects, tools, and debris shall not be left lying around in any place, particularly in areas where personnel walk.
- Spills shall be cleaned up immediately.
- Personnel are prohibited from walking or working on surfaces or equipment that is not intended as walking or working surfaces.
- Personnel shall take extra precautions, such as establishing firm handholds, wearing suitable footwear, and walking slowly when walking on surfaces during wet weather.

- Personnel shall not jump from elevated places or equipment.
- Personnel using hand and mechanical tools shall position themselves properly and consider the events if a tool slips or suddenly moves.
- Electrical extension cords and electrical wiring shall be kept clear of walking and working areas and/or covered, buried, or otherwise secured.
- Walking and working surfaces shall be properly maintained during inclement weather.
- Running is prohibited on job sites unless under emergency conditions.
- Employees exposed to fall hazards shall be protected by standard guardrail, catch platforms, temporary floors, safety nets, personal fall protection devices, or the equivalent. No employee may be exposed to a fall of over 6 feet without being adequately protected.

2.4.3 Fires, Explosions, and Hot Work

Hot work (e.g., welding, burning, and cutting) conducted on site shall comply with the following requirements:

- RWEC, Inc. procedure, “Hot Work in Hazardous Locations” (Current Revision) shall be followed whenever there is spark/ignition producing activities in progress at the project site.
- The Construction Site Manager or SSHO shall establish areas approved for welding, cutting, and other hot work.
- The Construction Site Manager or SSHO is responsible for authorizing welding, cutting, and other hot work in areas not specifically designed or approved for such operations (Hot Work Permit).
- All personnel shall be protected from welding radiation, flashes, sparks, molten metal, and slag.
- All welding, burning, and cutting equipment shall be inspected daily by the operator. Defective equipment shall be tagged and removed from service, replaced or repaired, and re-inspected before again being placed in service.
- All welders, cutters, and their supervisors shall be properly trained in the safe operation of their equipment, safe welding/cutting practices, and welding/cutting respiratory and fire protection.
- The handling of compressed gas cylinders shall comply with all applicable regulations and requirements established by the Navy and the Contractor.
- Cutting, welding, or other hot work shall be permitted only in areas that are or have been made fire safe.

- Cutting, welding, or other hot work shall NOT be permitted in the following situations:
 - In areas not authorized by the Construction Site Manager or SSHO;
 - In the presence of explosive atmospheres (i.e., mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside un-cleaned or improperly prepared drums, tanks, or other containers, and equipment that has previously contained such materials;
 - In any area where combustible gas indicator readings are in excess of 10 percent of the lower explosive limit;
 - On storage, process vessels, or lines in service that contain flammable or combustible liquids, gases, vapors, or solids.
- Before any welding, cutting, or other hot work is permitted, the area shall be inspected by the Construction Site Manager or SSHO to verify that the following requirements have been met:
 - Cutting and welding equipment to be used shall be in safe operating condition and in good repair.
 - Where practical, all combustible material shall be relocated at least 50 feet away from the hot work site. Where relocation is impractical, combustibles shall be protected with flameproof covers or otherwise shielded.
 - At a minimum, two fully charged and operable fire extinguishers, appropriate for the type of possible fire (4-A:60-B:C), shall be available at each work area.
 - A fire watch shall be required whenever hot work is performed in hazardous locations.
 - Combustible gas indicator readings shall be taken to verify the work area is free of combustible gases and vapors.
 - The work area is free of toxic contaminants at concentrations in excess of established TLVs or all personnel who will work in the area have been provided respiratory protection and protective apparel appropriate for the degree of exposure.
 - When hot work is to be performed on tanks or other vessels that contain or have contained flammable or combustible liquids, the vessel shall be properly isolated, purged, cleaned, or inerted as appropriate, to reduce the concentrations of flammable/combustible vapors to safe levels.
 - As required, a Hot Work Permit shall be completed by the Construction Site Manager or SSHO, reviewed with personnel who will perform the hot work, and posted near the job site.
 - If at any time during the hot work operation a change in conditions at the work site is suspected, such as a release of flammable gases or vapors in the work area,

work shall be stopped immediately and the Construction Site Manager or SSHO shall be notified. Such work stoppage invalidates the Hot Work Permit, and a new permit shall be completed after inspections and tests have been performed by the Construction Site Manager or SSHO.

2.4.4 Use of Small Tools

Hand and power tools shall be used, inspected, and maintained in accordance with the manufacturer's instructions and recommendations and will be used only for the purpose for which designed. A copy of the manufacturer's instructions and recommendations shall be maintained at the project site. The following requirements shall be adhered to:

- Tools designed to accommodate guards will be equipped with such guards when in use.
- Tools shall be inspected to ascertain safe operating conditions and are to be kept clean and free of accumulated dirt.
- Electric power tools and extension cords shall be used with ground fault circuit interrupter.
- Portable power cords will be designated as hard usage or extra hard usage and shall not be used if damaged, patched, oil-soaked, worn, or frayed.
- Connections on pneumatic lines shall be secured with a safety lashing.
- Explosive-actuated tools will meet the design requirements of American National Standards Institute A10.3 and only be operated by a qualified operator.
- Explosive-actuated tools and charges shall be secured at all times to prevent unauthorized possession or use.
- Explosive-actuated tools shall not be loaded until just prior to the intended firing time; neither loaded nor empty tools are to be pointed at any employees; hands shall be kept clear of the open barrel end.
- Hand tools, such as hammers and chisels, shall be inspected and dressed if necessary.

2.4.5 Use of Mechanized Equipment

Powered industrial trucks, forklifts, backhoes, and other types of specialized equipment may be used to accomplish the work at the project. The use of mechanized equipment can be dangerous. Extra care shall be exercised in its use and while working in the vicinity of this equipment.

2.4.5.1 Forklifts

All operators of this equipment shall be familiar with the requirements for inspection and operation of the equipment that they will be using. Before equipment is placed into use and on a daily basis, the operator is to inspect and verify that it is in safe operating condition. The following shall be adhered to while operating forklifts:

- Equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
- Getting on or off of equipment while it is in motion is prohibited.
- Equipment will be operated in accordance with the manufacturer's instructions and recommendations.
- Determinations of structures will be made in advance to verify that clearances and load capacities are safe for the passage of equipment.
- All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. Equipment designed to be serviced while running is exempt from this requirement.
- Forks will be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the engines stopped and brakes set, unless work being performed on the machine requires otherwise.
- No guard, safety appliance, or device will be removed from machinery or equipment, or made ineffective except for making immediate repairs, lubrications, or adjustments, and then only after the power has been shut off. All guards and devices will be replaced immediately after completion of repairs and adjustments and before power is turned on.
- Each forklift and other similar equipment will be equipped with at least one dry chemical or carbon dioxide fire extinguisher with a minimum rating of 10-B:C.
- Personnel will not work, pass under, or ride on the forks.
- All forklifts shall be equipped with a reverse signal alarm.
- Seat belt use is required while operating equipment.

Spotters for the operator will be the only personnel allowed in the vicinity operating forklifts. Personnel needing to approach forklifts while operating shall observe the following protocols:

- Make eye contact with the operator (and spotter).
- Signal the operator to cease forklift activity.
- Approach the equipment only after the operator has given signal to do so.

2.4.5.2 Heavy Construction Equipment

There are various types of heavy construction equipment that may be used during this project. All operators of this equipment shall be familiar with the requirements for inspection and operation of the equipment that they will be using. Before equipment is placed into use and on a daily basis, the operator is to inspect and verify that it is in safe operating condition. The following guidelines shall be adhered to while operating heavy construction equipment:

- Equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
- Getting on or off any equipment while it is in motion is prohibited.
- Equipment will be operated in accordance with the manufacturer's instructions and recommendations.
- Determinations of road conditions and structures will be made in advance to verify that clearances and load capacities are safe for the passage of equipment.
- All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. Equipment designed to be serviced while running is exempt from this requirement.
- Buckets, blades, dump bodies, and similar equipment will be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the engines stopped and brakes set, unless work being performed on the machine requires otherwise.
- No guard, safety appliance, or device will be removed from machinery or equipment, or made ineffective except for making immediate repairs, lubrications, or adjustments, and then only after the power has been shut off. All guards and devices will be replaced immediately after completion of repairs and adjustments and before power is turned on.
- Mechanized equipment will be shut down prior to and during fueling operations. Closed systems, with automatic shut-off, which prevent spillage if connections are broken, may be used to fuel diesel powered equipment left running.
- Each piece of heavy equipment and other similar equipment will be equipped with at least one dry chemical or carbon dioxide fire extinguisher with a minimum rating of 10-B:C.
- Personnel will not work, pass under, or ride in the buckets or booms of loaders in operation.
- All self-propelled construction equipment, whether moving alone or in combination, shall be equipped with a reverse signal alarm.
- Seat belt use is required while operating equipment.

Spotters for the operator will be the only personnel allowed in the vicinity of the heavy equipment. Spotters shall stay out of the boom radius area. Personnel needing to approach heavy equipment while operating shall observe the following protocols:

- Make eye contact with the operator (and spotter)
- Signal the operator to cease heavy equipment activity
- Approach the equipment only after the operator has given signal to do so.

2.4.5.3 Mechanized Equipment – Use of Quick Connect/Disconnect Systems

The manufacturer's specifications and operating manuals for hydraulic equipment and attachments utilizing quick connect/disconnect systems shall be followed. After completing a switch in attachments, the equipment operator shall take the actions necessary to ensure the quick connect/disconnect system is positively engaged.

2.4.5.4 Hydraulic Excavators, Wheel Loaders, Track Loaders, and Backhoe/Loaders Used to Transport or Hoist Loads with Rigging

When hydraulic excavating equipment is to be used to transport or hoist loads utilizing hooks, eyes, slings, chains, or other rigging the following requirements shall apply:

- Operations involving the use of hydraulic excavating equipment and rigging to transport or hoist loads require different operator skills and considerations than the standard excavating operations routinely performed with hydraulic excavating equipment. An AHA specific to the transporting or hoisting operation shall be prepared. The AHA shall include, but not be limited to the following:
 - Written proof of qualifications of equipment operators, riggers, and others involved in the transporting and hoisting operations
 - Performance of the operational test described in the *EM 385-1-1, Safety and Health Requirements Manual* (USACE, 2003)
 - Proper operating procedures in accordance with the equipment manufacturers operating manual
 - Proper use and on site availability of manufacturer's load rating capacities or charts
 - Proper use of rigging, including positive latching devices to secure the load and rigging
 - Inspection of rigging
 - Use of tag lines to control the load
 - Communications
 - Establishment of a sufficient swing radius (equipment, rigging, and load)
 - Stability of surfaces beneath the hydraulic excavating equipment.
- An operational test with the selected hydraulic excavating equipment will be performed in the presence of the Government Designated Authority (if available). The operational test shall consist of a demonstration that the test load and selected rigging can be safely lifted, maneuvered, controlled, stopped, and landed. The operational test shall be representative of the complete cycle of the proposed transporting or hoisting operation, including configuration, orientation, and positioning of the excavating equipment and the use of identical rigging. The test load shall be equivalent to the maximum anticipated load, but shall not exceed 100

percent of the manufacturer's load rating capacity for the excavating equipment as configured. Written documentation of the performance of the operational test outlining test procedures and results shall be maintained at the on-site project office.

- All rigging and rigging operations shall comply with the requirements of Section 15 of the *EM 385-1-1, Safety and Health Requirements Manual* (USACE, 2003). Hooks, eyes, slings, chains, or other rigging shall not be attached to or hung from the teeth of a bucket during the transporting or hoisting of a load by hydraulic excavating equipment.
- After the completion and acceptance of an operational test described in 16.N.01 (b) (USACE, 2003), if repairs, major maintenance, or reconfiguration are required to be performed on the hydraulic excavating equipment or attachments, another operational test as described in 16.N.01 (b) shall be performed to demonstrate that the completed repairs are satisfactory and that the test load and selected rigging can be safely lifted, maneuvered, controlled, stopped, and landed.
- Loads shall be lifted the minimum height necessary to clear the ground or other obstacles and carried as low as possible when the equipment is traveling.
- Loads shall not be lifted over personnel.
- Adequate clearances shall be maintained from electrical sources.
- Hydraulic excavating equipment shall not be used to hoist personnel. The riding of personnel on loads, hooks, hammers, buckets, or any other hydraulic excavating equipment attachment is prohibited.

2.4.6 Operation of Motor Vehicles

All company owned, leased, or rented vehicle operations shall comply with the requirements of RWEC, Inc, "Motor Vehicle Operation: General Requirements" (Current Revision). RWEC, vehicles shall be inspected on a daily basis. Additionally, all RWEC vehicles shall be inspected prior to any trip, 50 miles or greater. Vehicle inspections shall be documented on the Vehicle Inspection form.

Subcontractors operating motor vehicles at projects shall comply with all federal, state, and local traffic regulations. Subcontractors shall only use vehicles that are in good condition and safe to operate. Subcontractors shall inspect their vehicles on a daily basis and submit the inspection documentation to the Construction Site Manager or SSHO. Vehicle drivers shall keep alert for children and pedestrians; children and pedestrians shall always be given the right-of-way. All personnel must observe the maximum-posted speed limits on the base roadways and parking lots. Vehicles must not be parked closer than 15 feet from fire hydrants. Vehicle must pull over to the right side of the road when approached by emergency vehicles – remain stopped until the emergency vehicles have safely passed. All personnel shall drive defensively and wear seat belts while vehicles are in motion. Operators of vehicles may only use cellular telephones with hands-free devices while the vehicle is in motion. Prior to using a hand-held cellular telephone, drivers shall find a safe place to bring their vehicle to a stop. This requirement does not preclude passenger(s) from using cellular telephones while the vehicle is in motion. The use of headphones and earphones for music or radio is prohibited while operating a motor vehicle.

Since backing accidents at these types of projects are frequent, the following guidelines shall be observed:

- Backing of vehicles shall be avoided when possible.
- Extra care shall be taken to back vehicles when unavoidable.
- Back-up slowly and back-up the shortest distance necessary to accomplish the maneuver.
- When parking vehicles, vehicles shall be backed into the space whenever possible.
- Before entering a vehicle which has been parked, the driver should first physically perform a 360° walk around the vehicle to observe all areas and especially the area behind the vehicle.
- Spotters shall be used to back vehicles whenever possible.

2.4.7 Material Handling

Various materials and equipment may be handled manually during project operations. Care should be taken when lifting and handling heavy or bulky items to avoid back injuries. The following fundamentals address the proper lifting techniques that are essential in preventing back injuries:

- Size, shape, and weight of the object to be lifted shall first be considered. No individual employee is permitted to lift any object that weighs over 60-pounds. Multiple employees or the use of mechanical lifting devices is required for objects over the 60-pound limit.
- Anticipated path to be taken by the lifter should be inspected for the presence of slip, trip, and fall hazards.
- Feet shall be placed far enough apart for good balance and stability (typically shoulder width).
- Workers shall get as close to the load as possible. Legs shall be bent at the knees.
- Back shall be kept as straight as possible and abdominal muscles should be tightened.
- Twisting motions should be avoided when performing manual lifts.
- To lift the object, the legs are straightened from their bending position.
- Take small turning steps without twisting the knees or the back if it is necessary to turn with the load.
- A worker shall never carry a load that cannot be seen over or around.
- When placing an object down, the stance and position are identical to that for lifting. The legs are bent at the knees and the object lowered.

When two or more workers are required to handle the same object, coordination is essential for sharing the weight between the individuals carrying the load and to make a uniform lift. When carrying the object, each worker, if possible, shall face the direction in which the object is being carried. In handling bulky or heavy items, the following guidelines shall be followed to avoid injury to the hands and fingers:

- A firm grip on the object is essential; leather gloves shall be used as necessary.
- Hands and the object shall be free of oil, grease, and water, which might prevent a firm grip. Fingers shall be kept away from any points that could cause them to be pinched or crushed, especially when setting the object down.
- Item shall be inspected for metal slivers, sharp or jagged edges, burrs, and rough or slippery surfaces prior to being lifted.

2.4.8 Hazardous Energies (Electrical, Mechanical, and Pressurized Systems)

All portable electrical equipment and extension cords shall be protected with a ground fault circuit interrupter (GFCI) as part of the circuit. Applicable OSHA standards for electrical power, 29 CFR 1926 Subpart K and Section 11 of the *Safety and Health Requirements Manual* (USACE, 2003) apply.

Only qualified electricians may work on electrical circuits. Qualified personnel shall be trained with the proper use of the special precautionary techniques, PPE, including arc-flash, insulating and shielding materials, and insulated tools and test equipment.

Live parts to which an employee might be exposed shall be put into an electrically safe work condition (de-energized) before an employee works on or near them, unless it can be demonstrated that de-energizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations. This rule applies to all electrical work, including changing a light bulb.

Where work is performed in locations containing un-insulated energized overhead lines that are not guarded or isolated, precautions shall be taken to prevent employees from contacting such lines directly with any unguarded parts of their body or indirectly through conductive materials, tools, or equipment. Where the work to be performed is such that contact with un-insulated energized overhead lines is possible, the lines shall be de-energized and visibly grounded at the point of work, or suitably guarded.

Employees working in areas where electrical hazards are present shall be provided with, and shall use PPE that is designed and constructed for the specific part of the body to be protected and for the work to be performed, as required by Section 130.7 of National Fire Protection Association (NFPA) 70 E (2004), *Standard for Electrical Safety in the Workplace*.

Employees shall use insulated tools and/or handling equipment when working inside the Limited Approach Boundary of exposed live parts where tools or handling equipment might make accidental contact. Insulated tools shall be protected from damage to the insulating material. Before starting each electrical job, the qualified employee in charge shall conduct a job briefing with the employees involved. The briefing shall cover such subjects as hazards associated with the job, work procedures involved, special precautions, energy source controls, and PPE requirements.

Only hard or extra-hard usage extension cords shall be used. Extension cords, power tools, and lighting equipment shall be inspected before each use, protected from damage, and kept out of wet areas.

Lockout/tagout procedures are to be implemented during servicing or maintenance of machines and equipment to preclude the unexpected release of stored energy or inadvertent energization. These procedures are contained in RWEC, Inc. Procedure, "Control of Hazardous Energy Sources" (Current Revision) and comply with the requirements established in 29 CFR 1926.417. The handling of compressed gas cylinders shall comply with the requirements established in RWEC, "Compressed Gas Cylinders". All pressure vessels shall be designed, inspected, and tested in accordance with ASTM International standards. All air compressors and hoses shall be inspected before use, operated, and maintained by designated, qualified personnel. All air compressors shall be equipped with a pressure gauge and relief-valve, and only be operated at design pressures. Chicago fittings shall be secured together with tie-wire or equivalent and secured with safety lashings.

2.4.8.1 Portable Generator Use

Refer to the generator manufacturer's instructions for safe operation. Never use a generator in enclosed or partially enclosed spaces due to the quick build-up of high levels of carbon monoxide. The concentration of carbon monoxide shall be monitored when using generators in areas of poor ventilation. The concentration of carbon monoxide in the work area shall not be allowed to exceed 25 ppm.

Keep the generator dry and do not use in rain or wet conditions. To protect from moisture, operate it on a dry surface under an open, canopy-like structure. Dry your hands, if wet, before touching the generator. Use a heavy duty, outdoor-rated extension cord that is rated (in watts or amps) at least equal to the sum of the connected appliance loads. Check that the entire cord is free of cuts or tears and that the plug has all three prongs, especially a grounding pin. Ground generators by using a hand-inserted ground-rod, if recommended by the manufacturer.

Before refueling the generator, turn it off and let it cool down. Gasoline spilled on hot engine parts could ignite. A 20-A:B:C fire extinguisher shall be readily available in locations where a generator is being used.

Use hearing protection when working near a generator.

2.4.9 Intrusive Activities

Intrusive activities are defined as any activity that produces a man-made cut, cavity, trench, or depression into the earth's surface formed by earth removal or any activity that results in an object placed into the earth below the surface. These activities include excavating, drilling, augering, boring, shoveling, fence post driving, driving stakes, etc. Intrusive activities can be dangerous and can result in severe personal injury or death. Intrusive activities can also cause significant property damage to utilities, structures, and operational equipment. Breaching underground utilities can result in electrocution from damaged electrical lines, fires from broken fuel/gas lines, and disruption of telephone service. Positive steps shall be taken to determine if the area contains underground utilities or overhead hazards prior to commencing intrusive activities. It is important to understand that underground utilities have been found in areas that have been properly investigated and thought not to have utilities present. Personnel shall always be alert for marking tape, wires, pipes, previously disturbed soils, crushed stone or sand bedding/backfill, containers, discolored soil, MEC, or anything else unusual.

2.4.10 Excavation

When performing excavation activities, RWEC, “Excavation and Trenching” (Current Revision) and RWEC, “Underground/Overhead Utility Contact Prevention” (Current Revision) shall be followed. Any excavation five (5) feet deep or greater, into which persons will enter and perform work, shall be shored, sloped, or otherwise made safe for entry. Excavations less than five (5) feet in depth in which a competent person, as defined in 29 CFR 1926.650, examines and determines there to be no potential for cave-in, do not require protective systems. Certain excavations and trenches are considered confined spaces that require a confined space entry permit.

RWEC does not anticipate any excavation activities to be associated with this scope of work, however should excavation activities become necessary, daily inspections of the excavation shall be made by a competent person as defined in 29 CFR 1926.650. All excavated materials shall be placed at least two (2) feet from the edge of the excavation. Perimeter protection shall be provided for unattended excavations as specified in Section 25.B of the *EM 385-1-1, Safety and Health Requirements Manual* (USACE, 2003). Open excavations shall be lighted at night. The Construction Site Manager or SSHO shall evaluate the exposure of the excavation to employees, the public, vehicles, and equipment. This evaluation shall be used in determining the class of perimeter protection.

All project personnel shall participate in the site-specific training session and be instructed on the following requirements:

- Before commencing intrusive activities such as excavating, drilling, etc., the existence and location of underground pipes, electrical equipment, communication lines, gas lines, etc. shall be determined and documented. Only hand digging is permitted within three (3) feet of underground high voltage, product, or gas lines. Once the line is exposed, heavy equipment can be used but must remain at least three (3) feet from the exposed line.
- Operations shall be suspended, ignition sources eliminated, and the area shall be ventilated if the concentration of flammable/combustible vapors reach or exceed 10 percent of the lower explosive limit. A combustible gas indicator shall be used to make this determination.
- Personnel entry into any excavation five (5) feet deep or greater is only permitted if the necessary protective systems are in place. Employees shall wear a harness with a lifeline securely attached to it when entering excavations classified as confined spaces or that otherwise present the potential for emergency rescue.
- Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. If water is controlled or prevented from accumulating by the use of water removal equipment, the process shall be monitored by a competent person to ensure proper operation.

- Excavations greater than four (4) feet in depth, which require personnel to enter, shall have sufficient means of entry and egress (for example, stairs, ladders, and ramps). Ladders will be provided and secured as necessary. Ladders shall extend at least three (3) feet above grade. Means of entry/egress shall not require personnel to travel laterally more than 25 feet.

2.4.11 Confined Space Entry

Confined space entry is not expected in this project.

A confined space is defined as a space large enough and so configured that an employee can bodily enter and perform assigned work, has limited means for entry or exit, and is not designed for continuous employee occupancy. Confined space work may pose additional hazards such as chemical exposures, flammable/explosive atmospheres, electrocution, oxygen deficiency, etc. Only properly trained personnel shall supervise and participate in confined space entry procedures or serve as standby attendants.

Personnel shall never enter a confined space without a permit issued by the Construction Site Manager or SSHO. If personnel are uncertain about whether their activity involves a confined space entry, they shall stop work and notify their supervisor, the Construction Site Manager, or the SSHO. The fire department shall be requested to provide emergency rescue services prior to entering the confined spaces.

All confined spaces are initially considered permit required. Under certain conditions, a space may be re-classified as a non-permit, confined space provided the Construction Site Manager or SSHO approves the reclassification and the space meets the criteria.

2.4.12 Dust

The generation of dust shall be prevented when possible and controlled when necessary. Work practices shall be adjusted in a manner to minimize dust generation. Personnel shall avoid working in dust by positioning themselves upwind of dust generating activities. Excessive dust shall be controlled by suppression with water.

2.5 General Work Rules

While all the procedures outlined in this HASP are required, the following list presents general work rules that must be strictly enforced by the Construction Site Manager, SSHO, and Subcontractor Supervisors:

- Personnel are not allowed on site without the prior knowledge and consent of the Construction Site Manager.
- Loose jewelry, clothing, or long hair is not permitted on or near equipment with moving parts.
- Personnel shall not enter a restricted area unless authorized.
- All work zones, as established on the site, shall be observed. All required PPE shall be worn prior to entering these zones.

- Legible and understandable labels shall be affixed prominently to the containers of waste materials.
- All operations involving the potential for eye injury (fuel splash), etc. shall have eyewash units locally available and capable of delivering at least 0.4 gallons per minute for at least 15 minutes.
- If on-site activities continue later than dusk, adequate lighting shall be provided.
- Field activities shall be suspended during severe weather such as thunderstorms, lightning, and hurricane warnings.
- Damaged PPE shall be immediately repaired or replaced, as appropriate.
- Personnel shall thoroughly wash their hands and face before eating, smoking, or drinking.
- Unauthorized removal of materials from the project is prohibited.
- Possession of controlled substances and prohibited items, such as alcohol, illicit drugs, firearms, and weapons while working on site is strictly prohibited.
- Operations involving the potential for fire hazards shall be conducted in a manner as to minimize the risk of fire.
- Overhead and underground utility hazards shall be identified and/or located prior to conducting operations.

2.6 Workday Duration Limitations

This section describes the limitations of hours worked by site personnel and the general administrative qualifiers that guide the policy.

2.6.1 Workday Duration

The following workday duration limitations for hours worked on the projects are in effect:

- Personnel working on projects, including those who are operating hoisting equipment or mobile construction equipment, may work up to 12 hours at the site, which includes travel time to housing, but excludes non-compensated time. This workday duration is subject to reduction by the other requirements and factors described below. The 12-hour limit is primarily due to motor vehicle driving restrictions.
- Personnel shall not operate motor vehicles after being in a duty status (regardless of their role or function) for more than 12 hours during any 24-hour period without at least eight consecutive hours of rest. A minimum of eight consecutive hours shall be provided for rest in each 24-hour period.
- No employee may drive continuously for more than 10 hours in any single on-duty period. (Continuous period of more than 10 hours in any 24-hour period without at least eight consecutive hours of rest.)

2.6.2 General Administration

For each project effort, the Construction Site Manager is responsible for adjusting the workday duration within the limits set above.

The following factors will be considered by the Construction Site Manager for adjusting the workday duration:

- Time of year (e.g., reduce workday duration because there is less daylight in winter).
- Temperature/weather (e.g., reduce workday duration when the temperature is very hot, or very windy).
- Type of work (e.g., reduce workday duration for personnel involved in physically demanding phases of work).
- Individual personnel limitations (e.g., reduce workday duration for personnel with minor head colds or suffering from temporary effects of allergies).

For any questions regarding the implementation of this policy, contact the Program Health and Safety Manager (HSM).

2.7 Buddy System

The “buddy system” will be used at all times while working on-site – this requires that personnel maintain visual, voice, cellular telephone, or radio communication.

2.7.1 Lone Worker Procedure

Occasionally, only one worker may be present at the project to perform routine operations such as performing paperwork in the office. During these routine operations, there will be no “buddy” present on site. Even though there will be no buddy present on site at these times, communications must still be maintained. The lone field worker shall carry a cellular telephone or two-way radio on their person, at all times, while working at the project site (a landline telephone will suffice if the worker is in an office). Arrangements shall be made by the lone field workers, with at least one other person (monitor), to affect hourly communications. This hourly communication shall convey the following information:

- Present location
- Present status
- Anticipated activities and location of anticipated activities (include routes of expected travel)
- Estimated duration of anticipated activities
- Identify other anticipated activities, projected travel routes, and activity locations if the lone field worker will complete the initial task prior to making the next scheduled contact with the other employee

The lone field worker should initiate the hourly communication to the monitor at a pre-designated time (for example, the top of the hour). If the monitor does not receive the status call at the pre-designated time, then the monitor shall try to establish communications with the lone employee. If the lone field employee answers, then the update shall be made and the schedule of calls shall continue. If the lone field employee does not answer, the monitor shall try again in five minutes. If contact is not made on the second try, then the monitor shall notify the local emergency services, such as police or security force. All information provided from the last communication (see above) shall be provided to the emergency services. Additionally, the telephone number of the monitor (or other means of contact) shall be provided to the emergency services.

Upon mobilization to the project, the Construction Site Manager or SSHO shall verify that emergency communications are established for all activities.

Important: This procedure applies to routine tasks only. Non-routine tasks require the buddy system to be in effect.

2.8 Environmental Hazards

In addition to chemical and physical hazards, there are environmental hazards that may be present. For the purposes of this HASP, the environmental hazards are comprised of extreme ambient temperatures, insects, spiders, rodents, poisonous plants, and sunburn. This form is used to alert the Construction Site Manager or SSHO of these sensitivities so that additional precautions may be made.

2.8.1 Heat Stress

Heat stress is of concern for worker safety during the summer months or when working in areas containing steam lines or other heat generating equipment. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, PPE, workload, and individual characteristics. Heat stress can cause physical discomfort, loss of efficiency, or personal illness/injury.

Individuals vary in their susceptibility to heat stress. Factors that may predispose individuals to heat stress include the following:

- Lack of physical fitness and/or obesity
- Insufficient acclimation
- Age
- Dehydration
- Alcohol and/or drug use
- Infection
- Sunburn
- Diarrhea
- Chronic disease
- Medical conditions and/or the use of some medications, such as beta-blockers for high blood pressure

The amount and type of PPE worn, directly influences reduced work tolerance and the increased risk of heat stress. Personal protective equipment adds weight, bulk, reduces the body's capability for physiological thermoregulation (such as, evaporation, convection, and radiation), and increases energy expenditure.

2.8.1.1 Signs and Symptoms of Heat Stress

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur – ranging from mild to fatal.

These physical reactions to excessive heat include the following:

- Heat rash is caused by continuous exposure to heat and humidity and aggravated by chafing clothes. Heat rash decreases the body's ability to tolerate heat in addition to being a nuisance.
- Heat cramps are caused by profuse perspiration with inadequate electrolytic fluid replacement. Heat cramps cause painful muscle spasms and pain in the extremities and abdomen.
- Heat exhaustion is caused by increased stress on various organs to meet increased demand to cool the body. Heat exhaustion causes shallow breathing; pale, cool, moist skin; profuse sweating; and dizziness.
- Heat stroke is the most severe form of heat stress. Heat stroke symptoms include hot, dry skin; no perspiration; nausea; dizziness; confusion; strong, rapid pulse; coma; and sometimes death. Heat stroke is a serious medical emergency. The affected person shall be cooled down rapidly and medical attention must be given immediately.

The American Conference of Governmental Industrial Hygienist (2007) states that excessive heat stress may be marked by one or more of the following symptoms, and an individual's exposure to heat stress should be discontinued when any of the following occur:

- Sustained (several minutes) heart rate is in excess of 180 beats per minute minus the individual's age in years (180 minus age), for individuals with assessed normal cardiac performance
- Body core temperature is greater than 101.3 degrees Fahrenheit (°F) for medically selected and acclimatized personnel; or greater than 100.4°F in unselected, unacclimatized workers
- Recovery heart rate at one (1) minute after a peak work effort is greater than 110 beats per minute
- There are symptoms of sudden and severe fatigue, nausea, dizziness, or lightheadedness

An individual may be at greater risk of heat stress if:

- Profuse sweating is sustained over hours
- Weight loss over a shift is greater than 1.5 percent of body weight (ACGIH, 2007)

2.8.1.2 Heat Stress Prevention

The following practices will help prevent heat stress:

- Acclimatize workers to hot working conditions.
- Provide plenty of liquids to replace the body fluids lost by perspiration. Fluid intake should be forced because, under conditions of heat stress, the normal thirst mechanism is not adequate to bring about a voluntary replacement of lost fluids.
- Provide personal cooling devices.
- Conduct strenuous field operations in the early morning and provide shade when possible.
- Train personnel to recognize the signs and symptoms of heat stress, its prevention, and treatment.
- Rotate personnel to various job duties and establish adequate work/rest cycles.
- Provide shade or shelter during rest periods.

2.8.1.3 Heat Stress Treatment

Workers expressing the symptoms of heat stress shall notify the Construction Site Manager or SSHO immediately. At the onset of heat related illness, activities must be halted and treatment initiated. Early detection and treatment of heat stress helps to prevent further serious illness or injury. Individuals that have experienced heat related illness could become more sensitive and predisposed to additional future heat stress related problems.

Heat exhaustion can be alleviated by having the affected person rest in a cool, shaded location and have them drink cool water. To cool down the affected person's body:

- Remove impermeable PPE
- Remove worker from direct sunshine
- Apply copious amounts of cool, not cold, water on them
- Have them drink cool water, not cold, if conscious

2.8.1.4 Heat Stroke Treatment

Heat stroke is a true medical emergency. In a heat stroke situation, the body must be cooled immediately to prevent severe injury or death – medical attention must be immediately obtained. The following shall be performed if heat stroke is suspected:

- Transportation of the victim to a medical facility must not be delayed – seek immediate medical attention.

- Apply cold packs, if available; place under the arms, around the neck, or any other place where they can cool large surface blood vessels.
- If transportation to a medical facility is delayed, reduce body temperature by immersing victim in a cool water bath (however, be careful not to over-chill the victim once body temperature is reduced below 102°F). If this is not possible, continuously douse victim with cool water and fan for evaporative cooling.

2.8.1.5 Acclimatization

Physiologically adjusting or acclimatizing personnel to hot conditions is extremely important. Supervisors shall provide the necessary time for adequate worker acclimatization, due to each individual's physical condition and his or her ability to work in hot and humid environments.

2.8.1.6 Physiological Monitoring

Adequate work/rest periods shall be implemented as necessary to prevent heat stress on personnel. However, since individuals vary in their susceptibility to heat stress, RWEC will also utilize physiological monitoring to aid in measuring each individual's response to heat stress. The initiation of physiological monitoring will be required when employees are working in environments exceeding 90°F ambient air temperatures. Physiological monitoring is also required when ambient temperatures exceed 70°F and impermeable garments are worn. Ambient air temperatures shall be recorded on the Ambient Air Temperature Log when ambient temperatures exceed 70°F. The two physiological parameters that each individual will monitor are as follows:

- Heart Rate—Each individual will count his/her radial (wrist) pulse as early as possible during each rest period. If the heart rate of any individual exceeds 75 percent of their calculated maximum heart rate (maximum heart rate equals 200 minus age) at the beginning of the rest period, then the work cycle will be decreased by one-third. The rest period will remain the same. An individual is not permitted to return to work until his/her sustained heart rate is below 75 percent of their calculated maximum heart rate.
- Body Temperature—Each individual will measure his/her body temperature with an intra-aural (ear) or oral thermometer, as directed by the thermometer manufacturer's instructions, as early as possible in the first rest period. If the temperature exceeds 99.6°F at the beginning of the rest period, then the work cycle shall be decreased by one third. The rest period will remain the same.

An individual is not permitted to return to work if his/her temperature exceeds 100.4°F.

Training personnel (including subcontractor employees) who may be exposed to hot working environments shall be trained on the following:

- Employees:
 - Sources of heat stress, influence of protective clothing, and importance of acclimatization
 - How the body handles heat

- Heat-related illnesses and their recognition (signs and symptoms)
- Preventive/corrective measures
 - Individual factors, such as age, weight, gender, level of acclimatization, etc. that may predispose some workers to heat stress
 - Medical conditions and use of prescription drugs, such as beta blockers, that may modify a worker's ability to adapt physiologically to heat stress
 - Physiological monitoring, record keeping of body temperature/pulse, and establishment of work-rest regimes and first aid procedures
- Supervisors:
 - Physiological monitoring, record keeping of body temperature/pulse, and establishment of work-rest regimes and first aid procedures

2.8.2 Poisonous Plants

Three or five leaves radiating from a stem identify poison ivy, poison oak, and poison sumac. Poison ivy is in the form of a vine (and sometimes low-lying) while oak and sumac are bush-like. All of these plants can produce a delayed allergic reaction. The plant tissues have an oleoresin, which is active in live, dead, and dried parts. The oleoresin may be carried through smoke, dust, contaminated articles, and the hair of animals. Additionally, when operating a chain saw to clear brush, saw dust may be contaminated with enough oleoresin to cause a severe rash. Symptoms usually occur 24 to 48 hours after exposure resulting in rashes that itch and blister. Should exposure to any of these plants occur, wash the affected area with a mild soap and water within one-half hour, but do not scrub the area. The best preventative measure for poisonous plants is recognition and avoidance. The use of disposable gloves and Tyvek® coveralls is recommended to help prevent skin contact with these plants.

2.8.3 Flying Insects

Flying insects such as mosquitoes, wasps, hornets, and bees may be encountered while working at project sites. Personnel who are allergic to bee stings should notify their supervisor and the Construction Site Manager or SSHO. An optional Allergy/Sensitivity Questionnaire may be completed by employees to help identify personnel who are allergic or sensitive to insect bites or stings. Mosquito bites can be effectively prevented by the use of insect repellants containing DEET. Insect repellant containing DEET shall be available to personnel while working on site. Additionally, special insecticide preparations, such as Repel Permanone, shall be available for treating worker's clothing. Commercially prepared ointments for treatment of insect bites and bee stings shall be available on site. All personnel shall immediately report any bee stings to their supervisor and the Construction Site Manager or SSHO.

2.8.4 Spiders

Personnel shall be alert to the potential for spider bites. Spiders sometimes establish residence in dark places, stored clothing, and PPE. It is advisable for personnel to inspect clothing and PPE for spiders prior to donning. If a spider bite is sustained, personnel shall report it to the Construction Site Manager or SSHO.

3.0 PERSONAL PROTECTIVE EQUIPMENT

When engineering and administrative controls are not feasible or adequate to protect personnel from the hazards associated with project activities, PPE use will be required.

3.1 Respiratory Protection

Respiratory protection use is not anticipated for this project. In the event that some unforeseen circumstance requires the use of respiratory protection, the specifications of this section shall apply. The Program HSM shall be contacted prior to implementing the use of any respiratory protection during this project.

Respiratory protection equipment shall be NIOSH-approved and respirator use will conform to American National Standards Institute Z88.2 and OSHA 29 CFR 1910.134 requirements. RWEC Procedures “Respiratory Protection Program” details the medical qualification and training requirements, as well as the selection, use, inspection, cleaning, maintenance, storage, and fit testing of respiratory protection equipment. This procedure complies with the requirements contained within 29 CFR 1910.134 and will be maintained in the project office along with other pertinent RWEC Safety and Health Procedures.

All personnel (including visitors) using respiratory protection, shall possess a written opinion by the medical examiner of the person’s ability to use the necessary respiratory protective equipment and shall have successfully passed a respirator fit test in accordance with RWEC’s, “Respiratory Protection Program” within the last 12 months.

Levels of Protection

The following is a description of the PPE that will be required during various phases of the project.

3.1.1 Level D – Modified Protection

Additional PPE may be required for specific tasks. Level D – modified protection generally consists of the following PPE:

- Safety glasses with side shields meeting ANSI Z87.1 specifications.
- Face shield (when grinding or chipping materials).
- Safety-toed work boots meeting ANSI Z41 specifications.
- Nitrile or vinyl surgical gloves (inner, when working with DWV piping and systems).
- Hearing protection (if necessary or required).
- Hard hat meeting ANSI Z89.1 specifications.
- High visibility vests (when working near heavy equipment or vehicular traffic).
- Additional eye and face protection, such as face-shield, welder’s helmet, tinted cutting goggles (when welding/torching).

- Molten metal and slag protection (when welding/torching).
- Fire resistant Nomex coveralls (when welding/torching).
- Disposable coveralls (Poly coated Tyvek when contact with raw sewage is possible).
- Nitrile, PVC, or neoprene gloves (when contact with raw sewage is possible).
- Chemical protective boots (when contact with raw sewage is possible).

Employees working in areas where electrical hazards are present shall be provided with, and shall use, protective equipment as required by Section 130.7 of NFPA 70 E (2004) that is designed and constructed for the specific part of the body to be protected and for the work to be performed. Refer to Appendix F, “NFPA 70 E - Electrical Safety Tables”: Hazard/Risk Category Classifications; Protective Clothing and Personal Protective Equipment (PPE) Matrix; and Protective Clothing Characteristics).

3.1.2 Level D Protection

Level D protection is the minimum level of protection that will be used for all other activities at the project. Level D PPE shall, at a minimum, consist of:

- Safety-toed work boots meeting ANSI Z41 specifications.
- Safety glasses with side shields meeting ANSI Z87.1 specifications.
- Hard hat meeting ANSI Z89.1 specifications.
- Hearing protection (if necessary or required).
- High visibility vests (when working near mechanized equipment or vehicular traffic).
- Work gloves, such as leather, cotton, or other material that provides cut/abrasion resistance (as necessary).

3.2 Activity-Specific Levels of Protection

The required level of personal protection is specific to the activity being conducted and shall be documented in the Job Safety Analysis. Levels of PPE are subject to change or to modification.

4.0 SITE CONTROL AND WORK AREAS

Work areas will be established based upon activities. Measures shall be taken to control access to these areas. The work areas will consist of the construction area and the support area.

4.1 Construction Area

The construction area will consist of areas where construction and demolition activities occur. The perimeter will be secured with physical barriers such as polyethylene fencing, barricades, caution boundary tape, danger pylons, and/or appropriate markers designed to restrict entry to the area. Permission to enter the construction area will be limited to those individuals with the proper training and PPE.

4.2 Support Area

The support area will consist of a marked area where the support equipment and sanitation facilities (i.e., toilets, drinking water, and washing water) are staged. Smoking, drinking, and eating will be allowed only in designated areas. An eye wash station will be located in this area.

4.3 Access Controls

The Construction Site Manager or SSHO will establish the physical boundaries of each area and instruct all workers and visitors on the limits of the restricted areas. No one shall be allowed to enter the restricted area without the required protective equipment for that area.

4.4 Visitor Access

Visitors will be required to check in immediately upon arrival at the site. Each visitor will be required to provide and wear the necessary PPE during the visits and shall be escorted by project personnel.

4.5 Project Site Security

Ft. Buchanan has security measures in place, which must be followed by all personnel. All equipment shall be locked when project personnel are not present.

4.6 Posting Site

Appropriate warning signs warning shall be posted adjacent to work areas providing warning and caution of hazards, instructions, and directions to workers and non-project personnel.

5.0 PERSONAL HYGIENE

Adequate washing facilities shall be available for employee use at provided toilet, eating, and break facilities. Each washing facility shall be maintained in a sanitary condition and provided with water (either hot and cold running water or tepid running water), soap, and individual means of drying (disposable towels).

6.0 TRAINING REQUIREMENTS

This section describes general training, safety meetings, site-specific training, hazard communication, first aid and CPR, and other additional training, certification, and licenses needed to work on the project.

6.1 General Training

The Site Manager or SSHO is responsible for informing all site personnel and all visitors of the contents of the HASP and verifying that each person signs the HASP Acknowledgment Form. Documentation of certification of training requirements will be reviewed by the Construction Site Manager or SSHO, filed on site.

6.2 Safety Meetings

Employees shall be provided continuing safety and health training to enable them to perform their work in a safe manner.

6.2.1 Morning Safety Meetings

Subcontractors shall conduct a safety meeting at the beginning of each shift. The topics discussed at this daily “tailgate” safety meeting shall include safety and health considerations for the day’s activities, pertinent aspects of AHAs, necessary PPE, problems encountered, and new operations. The JSA(s) may be prepared as a component of the morning safety meeting. Attendance records and meeting notes shall be documented on the Safety Meeting Log and maintained with the project files.

6.2.2 Supervisor Safety Meetings

A supervisor safety meeting shall be held each month. This meeting will be held by the Construction Site Manager. The topics to be covered are as follows:

- Past activities
- Plans for new or changed operations
- Review of pertinent aspects of appropriate AHAs
- Establishment of safe working procedures for anticipated hazards
- Pertinent safety and health training and motivation
- Worker input and contributions

6.3 Site-Specific Training

All personnel working at the project shall attend a site-specific safety orientation covering the following topics:

- Purpose of the HASP and review of pertinent sections including emergency response procedures
- Review of applicable AHAs
- Names of personnel responsible for site safety (RWEC and subcontractors)

- The provisions for medical care and facilities and the names of CPR and first aid trained personnel assigned to the project
- Morning safety meeting procedures
- Safety and health hazards on site and the means to control/eliminate those hazards
- Responsibilities for accident prevention and maintaining safe and healthful work environments
- Procedures for reporting and correcting unsafe conditions or practices
- Employee “Stop Work Authority”
- Responsibilities for reporting all accidents and illnesses
- PPE (use and care)
- Location of safety equipment (i.e., fire extinguishers, first aid kits, etc.)
- Standard operating procedures, safety rules, and safe work practices for the project
- Work areas and site control measures
- Hazard Communication Program (includes discussion of MSDSs for hazardous chemicals used on site)
- Hot work procedures (when applicable)
- Lockout/tagout procedures
- Fall protection
- Housekeeping

The content of the training will be derived from information contained within the HASP.

6.4 Hazard Communication

All personnel performing field activities involving hazardous operational chemicals shall receive basic hazard communication training, which involves a review of the RWEC written hazard communication program, MSDSs, container labeling, chemical health hazards, and chemical hazard control procedures. Personnel shall be notified of the hazards of chemical contamination on site (if present) by a review of Section 4.1 of this HASP. Material Safety Data Sheets for additional materials brought on site shall be reviewed with personnel prior to the use.

6.5 First Aid and Cardiopulmonary Resuscitation

Each subcontractor shall provide at least one person trained and certified in both American Red Cross first aid techniques and CPR whenever their personnel are on-site. Additionally, the RWEC Construction Site Manager and SSO shall be certified in both. These employees will meet both the training and vaccination requirements.

6.6 Additional Training, Certification, and Licenses

In addition to the training, certification, and licensing previously detailed, the following shall also be required if deemed necessary based on project activities:

- All personnel operating motor vehicles shall hold a valid operator's license.
- Personnel wearing respiratory protection shall receive training in the use, care, and maintenance of that equipment on an annual basis. Fit testing for that equipment shall be performed on an annual basis as specified in 29 CFR 1910.134.
- All crane operators shall be designated as qualified meeting the specifications in the *EM 385-1-1, Safety and Health Requirements Manual* (USACE, 2003). Qualification is to be renewed every three years.
- Personnel operating powered industrial trucks (forklifts) shall have a certificate designating them as a qualified operator.
- Any employee operating a powder-actuated tool shall be qualified as an operator of that tool as specified by the manufacturer. Recertification, if any, shall be obtained as specified by the manufacturer.
- Confined space entry, attendant, and supervisory personnel shall be trained and certified as specified in 29 CFR 1910.146. Confined space rescue personnel shall be trained and certified as specified in 29 CFR 1910.146 and shall practice rescues (from similar types of confined spaces) on an annual basis.
- The certification and recertification requirements for first aid (three years) and CPR (one year) are applicable. First aid and CPR training/certification must be made by a reputable provider.
- Personnel working from ladders shall be initially trained in Ladder Safety.
- Personnel inspecting cranes shall have a certificate designating them as a competent person.
- Personnel inspecting excavations shall have a certificate designating them as a competent person.
- Personnel supervising scaffold erection shall have a certificate designating them as a competent person.
- Personnel operating arc-welding equipment shall have a certificate designating them as a qualified operator.
- Personnel operating gas welding and cutting equipment shall have a certificate designating them as a qualified operator.
- Personnel may only use portable fire extinguishers to extinguish small fires, if the employee has been trained and the employee is confident that the small fire can be safely extinguished.

APPENDIX C
BLOOD BORNE PATHOGENS EXPOSURE CONTROL PLAN

1.0 BLOOD-BORNE PATHOGEN EXPOSURE CONTROL PLAN

Blood-borne pathogens are microorganisms (i.e., bacteria, virus) sometimes present in blood and certain body fluids, which are capable of causing human disease or death. These pathogens can also be present on objects and surfaces that have had contact with infected blood or certain body fluids. Blood-borne pathogens are also capable of causing human disease or death to unprotected people who are exposed to infected blood or body fluids. Diseases caused by blood-borne pathogens include, but are not limited to, hepatitis A, hepatitis B, hepatitis C, malaria, acquired immunodeficiency syndrome (AIDS), and other sexually transmitted diseases. The most significant of these and of greatest concern are hepatitis B and AIDS.

Hepatitis B is a serious disease caused by the hepatitis B virus (HBV), which attacks the liver. The virus can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death. Exposure symptoms include fever, fatigue, nausea, vomiting, muscle aches, loss of appetite, and jaundice (yellowing of the eyes or skin). Hepatitis diagnosis is difficult because some symptoms are similar to the flu and may remain mild for an extended period. The HBV can remain infectious for up to 10 days, even in dried blood. Hepatitis B vaccine is available for all age groups to prevent HBV infection.

Human immunodeficiency virus (HIV) is the virus that causes AIDS. People with HIV have what is called HIV infection. Some of these people will develop AIDS because of their HIV infection. Humans may be infected with HIV for many years without experiencing any symptoms. Upon development of AIDS, symptoms may include weight loss, skin lesions, dry cough, fever, fatigue, diarrhea, swelling of the lymph glands, and death. Presently, no cure exists for HIV or AIDS, and no vaccination is currently available.

A hazard exists for blood and other bodily fluids to be infected with dangerous, infectious pathogens. Employees could become infected if they are exposed to these blood-borne pathogens.

The purpose of this Blood-borne Pathogen Exposure Control Plan is to provide the information, procedures, and requirements necessary to prevent employee exposure to blood-borne pathogens.

1.1 Regulatory, Requirement, and Policy Compliance

This Blood-borne Pathogen Exposure Control Plan has been prepared in compliance with:

- 29 CFR 1910.1030, Blood-borne Pathogens
- *EM 385-1-1, Safety and Health Requirements Manual* (USACE, 2003), Section A.03.06

1.2 Exposure Determination

OSHA requires employers to perform an exposure determination, identifying employees who may incur occupational exposure to blood or other potentially infectious materials. The exposure determination is made without regard to the use of PPE. For exposure determination purposes, employees are considered to be exposed, even if they wear PPE.

In general, it is anticipated that project activities will not present a high risk of employee exposure to blood or other body fluids. An exception to this would be under circumstances when personnel administer first aid care or CPR to injured workers and when personnel clean-up areas

and equipment that may have been exposed to blood because of the incident. In these cases, there is reasonable potential for employee skin, eye, mucous membrane, or potential contact with blood or other bodily fluids.

The OSHA requires a listing of job classifications with identification of tasks performed in which some employees may have potential for occupational exposure. This requirement is for employees to clearly understand the tasks that they may perform have a potential for occupational exposure to infectious materials. The job classifications and associated tasks with an exposure potential are as follows:

- Construction Site Manager—Administer first aid or CPR; decontaminate or disinfect surfaces and articles that have contacted infectious materials, and prepare biohazard waste for temporary storage and subsequent disposal.
- Site Safety and Health Officer—Administer first aid or CPR; decontaminate or disinfect surfaces and articles that have contacted infectious materials, and prepare biohazard waste for temporary storage and subsequent disposal.
- Subcontractor Supervisors—Administer first aid or CPR; decontaminate or disinfect surfaces and articles that have contacted infectious materials, and prepare biohazard waste for temporary storage and subsequent disposal.
- Laborer—Administer first aid or CPR; decontaminate or disinfect surfaces and articles that have contacted infectious materials, and prepare biohazard waste for temporary storage and subsequent disposal.

These employees have potential for exposure to blood-borne pathogens when administering first aid or CPR and when performing post-accident clean-up operations due to the following:

- Contact or absorption of blood or blood-contaminated objects through open or broken skin (i.e., cuts, scratches, and rashes)
- Blood splashes to their eyes, nose, or mouth, or other mucous membranes
- Punctures through the skin with a contaminated sharp object (such as, scissors)

Workers can reduce their risk of contacting blood-borne pathogens by implementing the recommended work practices (outlined in this plan) before, during, and after responding to emergency medical incidents primarily involving personal injuries.

1.3 Schedule of Implementation

The procedures in this Blood-borne Pathogen Exposure Control Plan are to be implemented immediately.

Implementation includes:

- Verifying personnel who are available to voluntarily provide first aid care and CPR hold a valid training certificate from a reputable training provider (American Red Cross or American Heart Association).

The Construction Site Manager or SSHO is responsible for verifying that an appropriate number of personnel have been trained in and hold valid certification to perform first aid and CPR.

- Verifying that personnel voluntarily providing first aid care, CPR, post-accident clean-up operations, and biohazard waste handling have received the specialized training meeting the requirements of 29 CFR 1910.1030; EM 385-1-1, *Safety and Health Requirements Manual* (USACE, 2003), Section A.03.06. This training is required for applicable personnel prior to the commencement of work and at least annually thereafter. This training shall cover the following elements:
 - Copy of 29 CFR 1910.1030 and this procedure including an explanation of the contents
 - General explanation of the epidemiology and symptoms of blood-borne diseases
 - Explanation of the modes of transmission of blood-borne pathogens
 - Explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials
 - Explanation of the use and limitations of practices that will prevent or reduce exposure including appropriate engineering controls, work practices, and PPE
 - Information of the types, proper use, location, removal, handling, decontamination, and/or disposal of PPE
 - Explanation of the basis for selection of PPE
 - Information on the hepatitis B vaccine, including information on its efficacy, safety, and the benefits of being vaccinated
 - Information on the appropriate actions to take and persons to contact in an emergency
 - Explanation of the procedure to follow if an exposure incident occurs including the method of reporting the incident and the medical follow-up that will be made available
 - Information on the medical counseling that is provided for exposed individuals
 - Explanation of required signs and labels

The Construction Site Manager or SSHO is responsible for verifying that this blood-borne pathogen training has occurred.

- Verifying that engineering controls are readily available at the project for use in an emergency. Engineering controls for this project include the following:
 - Red-bags for temporary storage of contaminated PPE and cleaning materials

- Appropriately labeled, 30-gallon hard-plastic container for the temporary storage of red-bagged waste
- Whisk-broom and dust pan for cleaning up contaminated broken glass
- Gallon container of Clorox® household bleach
- Large utility sponge
- Rolls of paper towels
- Container of liquid disinfectant hand soap
- “Biohazard” warning labels
- Individually packaged disinfectant towelettes
- CPR barriers

The Construction Site Manager or SSHO is responsible for verifying that this inventory of engineering controls is readily available at the project site for emergency use.

Personal protective equipment is necessary to prevent employee exposures to infectious materials. The necessary PPE, which shall be maintained separately for use in an emergency include the following:

- P-100 Particulate filtering face-piece respirator (3-M 8293 or equivalent)
- Face-shields with ratcheting head-suspension
- Safety glasses with clear lens
- Disposable nitrile examination gloves
- PVC Monkey Grip work gloves
- Poly-coated or Saran-coated disposable Tyvek® coveralls with attached hood
- Vinyl or latex disposable boot covers
- Fluid-resistant surgical hoods

The Construction Site Manager or SSHO is responsible for verifying that the above inventory of PPE is readily available at the project site for emergency use.

1.4 Work Practice Controls

Work practice controls reduce the likelihood of exposure by altering the manner in which a task is performed. The work practice controls outlined in this section are applicable to the administration of first aid and the subsequent clean-up operations.

Work practice controls shall be instituted whenever there is potential for employee contact with blood and bodily fluid. Situational examples where these controls are to be implemented include, but are not limited to:

- The voluntary administration of first aid care, such as application of bandages to minor or major cuts and abrasions of another person. This care may allow for contact with sores, wounds, broken skin, blood, or other bodily fluids.

- The voluntary administration of first aid care, such as providing CPR.
- Clean-up activities involving handling soiled articles (e.g., gauze, bandages, compresses, etc.) and the decontamination or disinfecting of surfaces and articles that have contacted potentially infectious materials, such as blood or other bodily fluids.
- Prepare biohazard waste for temporary storage and subsequent disposal.

Based upon professional judgment, an employee may choose to temporarily forego the use of PPE if the employee determines that the use of the PPE will further jeopardize his well-being or that of the injured worker. This limited application must be carefully evaluated and considered by the employee. If this situation does occur, RWEC will investigate and document the circumstances in an effort to provide alternative means to avoid further occurrence.

The following are specific work practice controls that shall be implemented in the above noted situations or whenever an employee determines that the implementation of these work practices is prudent or necessary:

- The appropriate PPE shall be donned prior to engaging in any activities that have the potential for employee contact with potentially infectious materials, such as blood or other bodily fluids.
- Hands and face will be washed as soon as possible after engaging in any activities that have the potential for employee contact with potentially infectious materials, such as blood or other bodily fluids. If wash facilities are not readily available, individually packaged disinfectant towelettes may be used in the interim.
- Eating, drinking, or smoking is not allowed in any work area where a potential exists for occupational exposure to blood-borne pathogens.
- Open wounds or cuts shall be promptly bandaged.
- Work surfaces and areas shall be cleaned and disinfected immediately after being contacted by potentially infectious materials. A 10 percent bleach solution (one part bleach added to nine parts water) shall be applied and allowed to have a contact time of 15 minutes. Non-disposable articles, equipment, or materials contaminated with potentially infectious materials shall be similarly cleaned/disinfected prior to reuse.
- All bins, pails, cans, and similar receptacles intended for reuse, which have become contaminated with blood or other potentially infectious materials shall be cleaned and disinfected immediately after use.
- Broken glassware, which may be contaminated, shall not be picked up directly by hand. Broken glass shall be picked-up using mechanical means, such as by using a whiskbroom and dustpan.
- All PPE shall be immediately removed upon leaving the potentially contaminated work area, or as soon as possible if visibly contaminated. The contaminated PPE shall be placed in a labeled “red-bag” and then placed in the 30-gallon container for temporary storage and subsequent disposal.

- Any clothing that has contacted blood or other potentially infectious fluids shall be removed as soon as possible.
- Any clothing that has contacted blood or infectious fluids shall be placed in a labeled “red-bag” and then placed in the 30-gallon container for temporary storage and subsequent disposal.

1.4.1 Universal Precautions

Universal precautions is a method of infection control, which operates on the assumption that all human blood and bodily fluids are to be treated as if they are known to be infectious for HIV, HBV, or other blood-borne pathogens. Universal precautions shall be observed to prevent contact with blood or other potentially infectious materials. Universal precautions consist of the following practices:

- All workers shall routinely use appropriate barrier precautions to prevent skin and mucous-membrane exposure when contact with blood or other bodily fluids is anticipated. Gloves should be worn for touching blood and bodily fluids, mucous membranes, or non-intact skin and for handling items or surfaces contaminated with blood or body fluids. Masks and protective eyewear or face shields shall be worn during procedures that are likely to generate droplets of blood or other body fluids to prevent exposure of mucous membranes of the mouth, nose, and eyes. Protective suits shall be worn during procedures that are likely to generate splashes of blood or other bodily fluids.
- Hands and other skin surfaces shall be washed immediately and thoroughly if contaminated with blood or other bodily fluids. Hands shall be washed immediately after gloves are removed, using a disinfectant soap.
- Cardiopulmonary resuscitation barriers or other ventilation devices should be available for use in areas in which the need for resuscitation is foreseeable.
- Workers who have exudative lesions or weeping dermatitis shall be excluded from handling potentially infectious materials until the condition resolves.
- Pregnant workers should be especially familiar with and strictly adhere to precautions to minimize the risk of transmission.

1.4.2 Personal Protective Equipment

The proper use of PPE is an effective work practice control. The following requirements for PPE are mandatory whenever there is potential for employee contact with blood and bodily fluid:

- Inspect PPE prior to use to verify it is in good working order and without defects.
- Blood or other potentially infectious materials.
- Disposable (single use) gloves, such as surgical or examination gloves shall be replaced when visibly soiled, torn, punctured, or when their ability to function as a barrier is compromised. Gloves should be changed as soon as possible after contact with blood or bodily fluids. After use, remove gloves from top to bottom inside out, not allowing unprotected skin to contact the exterior of the gloves. Hands and other

skin surfaces shall be washed with disinfectant soap immediately after care has been rendered or clean up has been completed. Gloves reduce the incidence of blood contamination of hands, but they cannot prevent penetrating injuries caused by sharp objects. Do not reuse gloves once removed. A CPR barrier shall be used when administering CPR.

- Protection for the eyes, face, hands, body, feet, and against inhalation hazards shall be provided as appropriate for each job.
- Gloves shall be worn when employees have the potential for direct skin contact with or when handling items or surfaces soiled with blood, other potentially infectious materials, mucous membranes, and non-intact skin.
- Polyvinyl chloride work gloves may be disinfected for immediate reuse if the integrity of the glove is not compromised; however, gloves must be discarded if they are cracked, peeling, discolored, torn, punctured, or exhibit other signs of deterioration. All gloves shall be discarded at the conclusion of the activity or at the end of the shift – whichever comes first.
- Masks and eye protection or chin-length face shields shall be worn whenever splashes, spray, splatter, droplets, or aerosols of blood or other potentially infectious materials may be generated and there is a potential for eye, nose, or mouth contamination.
- Fluid-resistant clothing (e.g., coated Tyvek® suits) shall be worn if there is a potential for splashing or spraying of blood or potentially infectious materials. Coated Tyvek® coveralls shall also be worn during clean-up activities involving decontamination or disinfecting of surfaces and articles that have contacted potentially infectious materials, and when preparing biohazard waste for temporary storage and subsequent disposal.
- Fluid-resistant clothing (e.g., coated Tyvek® suits) shall be worn if there is a potential for clothing becoming soaked with blood or other potentially infectious materials.
- Surgical caps or hoods shall be worn if there is a potential for splashing or splattering of blood or potentially infectious materials on the head.
- Fluid-proof coverings shall be worn if there is a potential for shoes or boots to contact blood or other potentially infectious materials.
- Disposable nitrile or vinyl gloves shall be worn for touching blood and bodily fluids requiring universal precautions, mucous membranes, or non-intact skin and for handling items or surfaces soiled with blood or bodily fluids to which universal precautions apply.

1.4.3 Waste Handling

All wastes generated because of administering emergency first aid care and the subsequent clean-up activities shall be placed in red-bags, labeled as a biohazard, and kept separately from other trash. Wastes used in medical emergency treatment (i.e., gloves, towels, and gauze) shall also be bagged and stored in an identical manner. Red-bagged, biohazard waste shall be placed in the 30-

gallon collection container, labeled, and secured for temporary storage and disposal. Additional containers shall be obtained as needed and containers shall not be overfilled.

1.5 Biohazard Waste Disposal

The RWEC Transportation and Disposal Coordinator shall be contacted to arrange for proper disposal of biohazard wastes. The waste shall remain secured on site in labeled container(s) until disposal arrangements have been made at an approved disposal facility. Disposal of the infectious waste container(s) shall be in accordance with applicable local, state, and federal regulations.

1.6 Medical Requirements

The medical requirements of this exposure control plan include provisions for vaccinations to all exposed employees as well as for post-exposure procedures and evaluations. All employees with potential for occupational exposure to blood borne pathogens shall receive the hepatitis B vaccination and tetanus vaccination prior to workplace exposure.

1.6.1 Hepatitis B Vaccination

All potentially exposed employees will have made available to them, at no cost, a hepatitis B vaccination. Recombivax or Accelerated Recombivax vaccines shall be utilized. If the employee has previously received the hepatitis B vaccination and/or antibody testing reveals that the employee is immune, a new vaccination is not required. Employees may be subjected to occupational exposure immediately after receiving the first shot in the hepatitis B vaccination series. Antibody testing shall be performed 30-days after completing the hepatitis B vaccination series. Employees unable to develop immunity shall be precluded from further occupational exposure. If a physician recommends a booster dose(s), the doses shall be provided according to standard recommendations for medical practice. The employee will also receive training as to the vaccine's efficacy, safety, benefits, and consequences prior to administration. The vaccination series may also be initiated within 24-hours of an incident with exposure potential.

1.6.2 Tetanus Vaccination

All employees subject to this policy shall maintain current status documentation of their tetanus vaccination (current status for tetanus vaccination is within five (5) years). All potentially exposed employees shall be offered a tetanus vaccination at no cost.

1.6.3 Post-Exposure Procedures and Evaluation

All exposure incidents shall be reported as required by RWEC, Inc., "Accident Prevention Program: Reporting, Investigation and Review" (Current Revision). The occupational medicine physician shall be advised in addition to standard notification procedures.

Following a report of an exposure incident, each involved employee shall be offered a confidential medical evaluation and follow-up, which includes at least the following elements:

- Documentation of the route(s) of exposure.
- Hepatitis B virus and HIV antibody status of the source patient(s) (if known), and how the exposure occurred.
- The medical confidentiality rights of the source patient shall be preserved at all times.

- If the source patient can be determined and permission is obtained, collection of and testing of the source patient's blood to determine the presence of HIV or HBV infection shall be conducted under the direction of the attending physician.
- Collection of blood from the exposed employee as soon as possible after the exposure incident for the determination of HIV and/or HBV status. Actual core antibody and surface antigen testing of the blood or serum sample may be done at that time or later if the employee so requests. If the test is deferred, arrangements shall be made through the attending physician to properly archive the specimen.
- Follow-up of the exposed employee including antibody and antigen testing, counseling, illness reporting, and safe and effective post-exposure prophylaxis, according to standard recommendations for medical practice as defined by the occupational medicine physician.

Where applicable laws require employee consent, documented consent shall be obtained prior to testing. If an employee refuses the blood test, documentation of the refusal will be made. Documentation of the test results shall be made available to the exposed employee(s). All test results shall be kept confidential.

1.6.4 Physician Information

The following information shall be provided to the evaluating physician:

- Copy of 29 CFR 1910.1030 and its appendices
- Description of the affected employee's duties as they relate to the employee's occupational exposure

1.6.5 Physician Opinion

For each potentially exposed employee evaluation, the employee shall receive a copy of the evaluating physician's written opinion within 15 working days of the completion of the evaluation. The written opinion shall be limited to the following information:

- The physician's recommended limitations upon the employee's ability to receive the hepatitis B vaccination.
- A statement that the employee has been informed of the results of the medical evaluation and that the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials, which require further evaluation or treatment.
- Specific findings or diagnoses, which are related to the employee's ability to receive the HBV vaccination. Any other findings and diagnoses shall remain confidential.

1.6.6 Hazard Communication

There are regulatory requirements for labels, signs, and training. The provisions and exceptions for these are contained in the subsections below.

1.6.7 Warning Labels

Containers used for disposal of blood-contaminated supplies and waste will be labeled in accordance with the word “biohazard.” The following symbol shall be an integral part of the label:



APPENDIX D
ROUTE TO HOSPITAL AND HEALTH RESOURCE CLINIC

Direction to Hospital:

1. Take Langley Road to Base Exit # 3 and turn north unto Road # 53.
2. Road # 53 towards Fajardo for 7.7 miles and turn right to Avenida El Conquistador
3. Drive 0.61 miles on Avenida El Conquistador and turn right to Ave. General Valero.
4. Drive 0.33 miles in General Valero Ave. Arrive at Hospital San Pablo del Este on your right.

1.1 First Aid and Medical Facilities

The following addresses first aid and medical facilities:

- Effective emergency communication devices must always be available while personnel are present at the site.
- Employees working alone in a remote location or away from other workers shall be provided an effective means of emergency communications. The selected communication must be readily available (easily within the immediate reach) of the employee and must be tested prior to the start of work to verify that it effectively operates in the area/environment. An employee check-in/check-out communication procedure shall be developed to assure employee safety.
- Emergency telephone numbers shall be posted at all RWEC-controlled telephones.
- A large first aid kit shall be provided and maintained at the project. The first aid kit shall be inspected weekly by the SSHO. A seal may be placed on first aid kits to allow for less frequent inspections, such as, if the seal is not broken, then an inspection is not required. There shall be a small first aid kit available in all project vehicles. First aid kits in project vehicles do not need to be inspected if the factory plastic wrapping is intact.
- The nearest hospital for the project is:

Hospital San Pablo
404 General Valero Avenue
Fajardo, Puerto Rico 00738
(787) 655-5050

The route maps to the hospital shall be available in all project vehicles; however, the facility to care for serious medical emergencies shall be determined by the Emergency Medical Services responding to the incident. At a minimum, Construction Site Manager, the SSHO, and at least one other on-site employee (subcontractor) shall be certified in first aid and cardiopulmonary resuscitation (CPR) during intrusive activities. First aid and CPR training/certification must be made by a reputable provider, such as, the American Red Cross or American Heart Association.

APPENDIX E
OSHA 300 LOG

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 2008



U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.37, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0
(G)	(H)	(I)	(J)

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(K)	(L)

Total number of...			
(M)			
Injury	0	(4) Poisoning	0
Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other illnesses	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 56 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave. NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name Right Way Environmental Contractors, Inc.

Street Road 153 Km 8.1

City Barranquitas State PR Zip 794

Industry description (e.g., Manufacture of motor truck trailers)
Environmental restoration and construction company

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

OR North American Industrial Classification (NAICS), if known (e.g., 336212)

Employment information

Annual average number of employees 27

Total hours worked by all employees last year 44,167

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Pedro Tejada
Company executive

Vice-President
Title

787-857-8832
Phone

17-Jan-08
Date

APPENDIX F
ADVERSE WEATHER CONDITIONS PLAN

1.0 ADVERSE WEATHER CONDITIONS PLAN

1.1 Adverse Weather Conditions/Natural Disasters

Personnel should be aware of the possibility for the occurrence of severe weather such as hurricanes, lightning, thunderstorms, or high winds. Necessary precautions or response, directed by the Construction Site Manager, will be taken in the event of severe weather. For example, outdoor operations will be suspended when the potential for lightning occurs. Local weather broadcasts will be monitored by the Construction Site Manager or SSHO when the likelihood for severe weather exists. Voice, phone, or radio communication will be utilized to alert crews to threatening weather. A severe weather shelter shall be identified and the location communicated with the crew(s) upon project mobilization.

1.1.1 Storm Procedures

If weather authorities issue a gale warning or warn of any other storm of greater magnitude, such as a hurricane, the site shall be secured to protect personnel, nearby residents, and surrounding property. At a minimum, the following procedures should be implemented:

- Monitor emergency radio frequency
- Close all openings in pipelines, tanks, drums, or similar material containers
- Remove loose materials, tools, and other equipment from open areas; secure all work items

All work activities will stop and be evaluated when winds are greater than 25 miles per hour. During wind conditions of 15 to 25 miles per hour, dust control measures will be upgraded, and specific hazards due to high winds must be evaluated for control.

1.1.2 Hurricane Procedures

NAPR requires that site be secured and contractors' personnel move off the base 24 hours before Condition 1 exists.

Unless otherwise directed by the AFCEE COR, comply with the following guidelines:

- **Condition One**—(sustained winds of 50 knots/57.5 mph or greater expected within 12 hours): Secure the job site. Continue recommended evacuation of personnel.
- **Condition Two**—(sustained winds of 50 knots/57.5 mph or greater expected within 24 hours): Control or cease routine activities until securing operation is complete. Reinforce or remove formwork and scaffolding. Secure machinery, tools, equipment, and materials, or remove from the job site. Begin recommended evacuation of personnel.
- **Condition Three**—(sustained winds of 50 knots/57.5 mph or greater expected within 48 hours): Maintain “Condition Four” requirements and commence securing operations necessary for “Condition One” that cannot be completed within 18 hours.
- **Condition Four**—(sustained winds of 50 knots/57.5 mph or greater expected within 72 hours): Perform normal daily job-site cleanup and maintain good housekeeping practices. Collect scrap lumber, waste material, and rubbish for removal and disposal

at the close of each workday. Maintain good housekeeping at the construction site, including storage areas. Stack form lumber in neat piles less than four (4) feet high.

1.1.3 Lightning Safety

Outdoor activities will be suspended when the potential for lightning occurs. The following measures, offered by the National Lightning Safety Institute of Louisville, Colorado shall be taken to minimize the possibility of injury to personnel by lightning:

- The Construction Site Manager or SSHO is responsible to monitor weather conditions.
- Upon seeing lightning or hearing thunder, outdoor activities shall be suspended and personnel shall be evacuated to safe areas (i.e., inside vehicles or buildings). When clouds with dark bases and wind speeds pick up, anticipate thunderstorms. Those who have been struck by lightning did not seek cover in a timely fashion.
- The Construction Site Manager or SSHO will continue to monitor weather conditions.
- Outdoor activities may resume 30-minutes after the last bolt of lightning was observed and the last clap of thunder was heard.

People who have been struck by lightning do not carry an electrical charge and are safe to handle. Apply first aid immediately, if you are qualified to do so. Get emergency help promptly.

Safe areas include:

- Fully enclosed metal-topped vehicles with windows up
- Substantial and permanent buildings

Unsafe areas include:

- Small structures including huts and rain shelters
- Nearby metallic objects like fences, gates, instrumentation and electrical equipment, wires, and power poles

The following shall be avoided when lightning is in the area:

- Trees
- Water
- Open fields
- Using hard-wired telephones and headsets

If hopelessly isolated from shelter during close-in lightning, adopt a low crouching position with feet together (up on toes, if possible) and hands on ears. If hair stands on end or rises on back of neck, a lightning strike is imminent.

Remember the warning phrase from the National Lightning Safety Institute: “If you can see it (lightning), flee it; if you can hear it (thunder), clear it.”

1.2 Emergency Equipment

At a minimum, the following emergency equipment shall be maintained at the project site(s):

- Fire extinguishers
- First aid kits
- Blood borne pathogen control supplies or kit
- Emergency eyewash, if corrosive materials are being used
- Spill control
- Communication devices

This equipment is to be inspected by the Construction Site Manager or SSHO on a weekly basis to verify that they are in good condition, ready to use, and easily accessible. Note: a seal may be maintained on first aid kits to indicate if the kit has been accessed within the preceding week. The weekly inspection of the first aid kit will only be necessary if the seal has been broken.

1.3 Critique and Follow-Up of Emergency Procedures

The Program HSM and AFCEE COR shall be verbally notified immediately and receive a written notification within 24 hours of all accidents or incidents including releases, fires, or explosions. The report shall include the following items:

- Name, organization, telephone number, and location of the contractor
- Name and title of the person(s) reporting
- Date and time of accident/incident
- Location of accident/incident
- Brief summary of accident/incident including pertinent details, such as, type of operation ongoing at time of accident
- Cause of accident/incident, if known
- Casualties
- Details of any contamination
- Estimated property damage, if applicable
- Nature of damage, effect on contract schedule
- Action taken by RWEC to maximize safety and security
- Other damage or injuries sustained (public or private)

The Construction Site Manager and SSHO will investigate the cause of the incident to prevent its re-occurrence. The investigation should begin as soon as practical after the incident is under control but not later than the first workday after the incident. Investigations will follow the procedures described below:

- Interview witnesses and participants as soon as possible or practical
- Determine the chronological sequence of events (opinions as to cause should not be solicited at this time)
- Note any movement, sounds, noises, or other sensory perceptions experienced by the participants or witnesses
- Obtain weather data
- Ascertain the location and position of all switches, controls, etc.
- Verify the condition of all safeguards
- Determine if a revision to emergency procedures is warranted

After the facts have been collected, causal factors should be identified and controlled/eliminated

APPENDIX G
ACCIDENT PREVENTION PLAN

1.0 ACCIDENT PREVENTION PLAN

This section addresses general safety areas specified in Appendix A of the EM 385-1-1, *Safety and Health Requirements Manual* (USACE, 2003), as components of the Accident Prevention Plan.

1.1 Project Safety Goal

Safety is RWEC's highest priority. Right Way Environmental Contractors, Inc. and project personnel have targeted a goal of zero injuries, illnesses, and environmental incidents for the duration of this project. All activities shall be conducted in a manner that supports this goal.



1.2 Indoctrination of New Employees

Both RWEC and subcontractor personnel are required to attend a safety-orientation meeting prior to commencing work. Safety-orientation meetings shall be documented and kept on file. Refer to Section 9.3 for an outline of the information that is conveyed to all personnel.

1.3 Fire Prevention and Protection

This section details fire prevention and protection procedures/resources to be used at each project.

1.3.1 Workplace Fire Hazards

The primary fire hazards at the NAPR project consist of fueling operations, storage of fuels and other flammable liquids at the project site, and welding and cutting activities.

1.3.2 Potential Ignition Sources

The potential ignition sources at the project include smoking materials, welding/cutting equipment, vehicle/equipment exhaust, catalytic converters, and engine block surfaces. Personnel shall also be alert for other ignition sources such as, static electricity, lightning, and electrical equipment.

1.3.3 Fire Control Systems, Equipment, and Procedures

Depending on the nature and extent of any fire, the following fire control systems and equipment shall be evaluated or provided at the project:

- The Chief, Ceiba Airport Fire Department shall be contacted, prior to beginning new operations at the project site. The Chief, Ceiba Airport fire Department shall also be contacted at the conclusion of operations.

- Fire extinguishers shall be available at all active work areas. Project vehicles and heavy equipment shall also be equipped with fire extinguishers.
- A RWEC Hot Work Permit is required before a flame or spark-producing activity is to commence (Section 4.2.3). A Cutting, Welding, and Brazing Permit may also be required from the Ceiba Airport Fire Department.
- The AHA for fueling operations shall be followed.
- Flammable and oxidizing materials shall be stored in marked (No Smoking, Matches, or Open Flame) flammable materials storage areas with fire extinguishers available.
- Smoking shall only be permitted in designated areas. Personnel shall never discard cigarette butts into the environment while working at the project.
- All fires, no matter how small, shall be reported to the NAPR and Ceiba Airport Fire Department immediately.
- Project personnel are only permitted to extinguish small fires in their incipient stages.
- Fighting fires is prohibited by project personnel and shall only be performed by fire department personnel (Section 11.5).

1.3.4 Fire Control Equipment Maintenance Responsibilities

Subcontractors are responsible for performing the monthly inspections and obtaining annual service for all fire extinguishers used at the project. Vehicle and heavy equipment operators are responsible for the inspection of fire extinguishers on vehicles/equipment. The Construction Site Manager or SSHO is responsible for verifying the monthly inspections and annual service of all fire extinguishers used at the project are completed.

1.4 Housekeeping

Housekeeping shall be a priority at each project site. The following provisions are specified to maintain a high standard of housekeeping:

- The importance of housekeeping and the expectations that good housekeeping shall be maintained will be regular topics of the morning safety meetings.
- Job sites and work areas shall be cleaned up on a daily basis.
- All subcontractors are required to maintain good housekeeping practices.
- Dumpsters and adequate waste/trash receptacles shall be provided as necessary in sufficient quantities in active work areas and are to be emptied regularly.
- Housekeeping is an operational/safety item, which shall be regularly considered during routine inspections.
- Nails shall be bent-over or removed from scrap lumber immediately.

1.5 Mechanical Equipment Inspections

Before any machinery or mechanized equipment is placed in use, it shall be inspected and tested in accordance with the manufacturer's recommendations and requirements of the EM 385-1-1, *Safety and Health Requirements Manual* (USACE, 2003) and shall be certified in writing by a competent person to meet the manufacturer's recommendations and requirements of the manual. Subsequent re-inspections will be conducted at least annually thereafter. All safety deficiencies noted during the inspection shall be corrected prior to the equipment being placed in service at the project. If at any time the machinery or mechanized equipment is removed and subsequently returned to the project (other than equipment removed for routine off-site operations as part of the project), it shall be re-inspected and recertified prior to use. All heavy equipment shall be inspected by each operator prior to use on the project and shall then be inspected on a daily basis. Daily inspections shall be documented on the Daily Equipment Inspection form. All small equipment shall be inspected by each operator prior to use on the project and shall then be inspected according to manufacturer recommendations on a daily basis. Deficiencies in the equipment shall be noted on the form. All inspection documentation shall be submitted to the Construction Site Manager or SSHO prior to using the equipment if safety deficiencies are observed and at the end of the day if no safety deficiencies are observed.

The SSHO shall immediately evaluate the inspection forms and determine if the equipment is in need of immediate repairs and if it should be "red tagged" and taken out of service. If the equipment is taken out of service, then the equipment shall not be used until the Construction Site Manager or SSHO is satisfied that the necessary repairs have been made. For minor deficiencies that do not compromise the safe operation of the equipment, repairs shall be made at the discretion of the equipment owner.

APPENDIX H
SAFETY PLAN ACKNOWLEDGEMENT

APPENDIX I
HEALTH AND SAFETY PLAN AMENDMENT
DOCUMENTATION FORM

**Site Specific Health & Safety Plan
Amendment Documentation**

Project Name:

Project No.

Amendment No.

Date:

The Amendment Addresses the Following Sections:

Task(s) Amendment Affects:

Reason For Amendment:

Amendment:

Completed by:

Approved by:

APPENDIX C
PROJECT FORMS

CQC TEST REPORT LIST

CQC REPORT # _____ SH _____ OF _____ DATE _____

CONTRACTOR: _____ CONTRACT #: _____

PROJECT TITLE: _____ LOCATION: _____

SPEC REF OR DWG#	TYPE OF TEST	DATE PERFORMED	RESULTS	REMARKS

Note: This form shall be used by the Contractor to track CQC Testing. Provide attachments as required.

RWEC

DAILY QUALITY CONTROL REPORT

Daily Report No.

Date:

Contract No.:

Contract Title:

Weather:

Precipitation:

Temp.: Min. Max.

1. Contract/Subcontractors and Area of Responsibility:

NUMBER	TRADE	HOURS	EMPLOYER	LOCATION/DESCRIPTION WORK

2. Equipment: (Not hand tools)

Plant/Equipment	Arrival Date	Departure Date	Date of Safety Check	Hours Used	Hours Idle	Hours Repair

3. Work Performed Today: (Indicate location and description of work performed by prime and/or subcontractors. When network analysis is used, identify work by activity number).

RWEC

4. Control Activities Performed:

Preparatory Inspections: (Identify feature of work and attach minutes).

Initial Inspection: (Identify feature of work and attach minutes). All equipment inspections are performed upon arrival.

Follow-up Inspection: (List inspections performed, results of inspection compared to specification requirements, and corrective actions taken when deficiencies are noted).

5. Tests Performed and Test Results:

6. Material Received: (Note inspection results and storage provided)

<u>Item</u>	<u>Quantity</u>	<u>Description</u>	<u>Storage Provided</u>	Inspection Results		
				Accept	Reject	Comments

7. Submittals Reviewed:

(a) **Submittal No.** (b) **Spec/Plan Reference** (c) **By Whom** (d) **Action**

8. Offsite Surveillance Activities, Including Action Taken:

9. Job Safety: (List items checked, results, instructions and corrective actions taken).
Standard operation procedures were used. RWEC:

10. Remarks: (Instructions received or given. Conflict(s) in plans and /or specifications. Delays encountered). RWEC anticipates delays during and after every rainstorm.

Contractor’s Verification: On behalf of the Contractor, I certify this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as may be noted above.

Name and Title

Date

RWEC HC 72 Box 3744 Naranjito, P.R. 00719 Phone: 787-857-8832 Fax: 787-857-6068	Variance No:	
	Date of Issue:	
	Page 1 of 1	
Project Name:	Contract Number:	
- Field Variance Report -		
I. Type of Variance:		
<input type="checkbox"/>	Differing Site Condition	<input type="checkbox"/>
<input type="checkbox"/>	Change in Regulatory Requirement	<input type="checkbox"/>
<input type="checkbox"/>	Change in Quantity	<input type="checkbox"/>
<input type="checkbox"/>	Other:	<input type="checkbox"/>
II. Drawing/Specification:		
III. Description:		
Originated by:		Date Prepared:
To Be Performed by:		Date:
To be Verified by:		Date:
IV. Justification for Variance:		
V. Impact to Schedule		VI. Estimated Cost Variance:
		Estimated Fee Adjustment:
		Estimated Cost + Fee Variance:
VII. Reference Documents:		
- Signatures -		
Requested by:		Project Manager Approval:
Date		Date
Approved by:		QA Approval:
Date		Date

INITIAL AND FOLLOW-UP PHASE CHECKLIST

- INITIAL
- FOLLOW-UP

Contract No.: _____

Date: _____

Specification Paragraph or Section: _____

Description and Location of Work Inspected: _____

REFERENCE CONTRACT DRAWINGS: _____

A. PERSONNEL PRESENT:

	<u>NAME</u>	<u>POSITON</u>	<u>COMPANY</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____

B. MATERIALS AND EQUIPMENT BEING USED ARE IN STRICT COMPLIANCE WITH THE CONTRACT PLANS AND SPECIFICATIONS: YES _____ NO _____
IF NOT, EXPLAIN:

C. PROCEDURES AND/OR WORK METHODS WITNESSED ARE IN STRICT COMPLIANCE WITH THE CONTRACT SPECIFICATIONS: YES _____ NO _____
IF NOT, EXPLAIN:

D. WORKMANSHIP IS ACCEPTABLE: YES _____ NO _____
STATE AREAS WHERE IMPROVEMENT IS NEEDED:

E. TESTS PERFORMED: _____

F. SAFETY VIOLATIONS NOTED: YES _____ NO _____
IF YES, CORRECTIVE ACTION TAKEN:

G IS REINSPECTION REQUIRES: YES _____ NO _____
IF SO, LIST ITEMS OR AREAS REQUIRING REINSPECTION:

 Quality Control Representative

LIST OF OUTSTANDING DEFICIENCIES

Sheet ___ of ___ DATE: _____

PROJECT TITLE: _____

CONTRACTOR: _____

LOCATION: _____

CQC REPORT #: _____

CONTRACT # _____

SPEC REF OR DWG #	LOCATION ON PROJECT	DESCRIPTION OF DEFICIENCY	DATE FOUND	DATE TO BE CORRECTED	DATE CORRECTED	REMARKS

Note: This form shall be used by the Contractor to track outstanding construction deficiencies.

NONCONFORMANCE REPORT

Project Name: _____ Project Number: _____

Non-Conformance:

Identified by: _____ Date: _____

Corrective Action Required to Rectify
and to Prevent Recurrence:

Prepared By: _____
Date: _____

To Be Performed By: _____ Date: _____

Must Correction by Verified? Yes _____ No _____

To Be Verified By: _____

Corrective Action Taken:

Performed By: _____ Date: _____

Verified By: _____ Date: _____

Name

Quality Control Officer

Title

Signature

PREPARATORY INSPECTION OUTLINE

Contract No.: _____ **Date:** _____

Title and No. of Technical Section: _____

Reference Contract Drawings: _____

A. PLANNED ATTENDANTS:

<u>NAME</u>	<u>POSITION</u>	<u>COMPANY</u>

B. SUBMITTALS REQUIRED TO BEGIN WORK:

<u>ITEM</u>	<u>SUBMITTAL #</u>	<u>ACTION CODE</u>

I HEREBY DECLARE THAT THE ABOVE-REQUIRED MATERIALS DELIVERED TO THE JOBSITE ARE CERTIFIED TO BE THE SAME AS THOSE SUBMITTED AND APPROVED.

Quality Control Representative

C. EQUIPMENT TO BE USED IN EXECUTING WORK:

- a. _____
- b. _____
- c. _____

D. WORK AREAS EXAMINED TO ASCERTAIN THAT ALL PRELIMINARY WORK HAS BEEN COMPLETED:

E. METHODS AND PROCEDURES FOR PERFORMING QUALITY CONTROL -INCLUDING SPECIFIC TESTING REQUIREMENTS:

THE ABOVE METHODS AND PROCEDURES OUTLINED ARE CERTIFIED TO COMPLY WITH THE CONTRACT REQUIREMENTS AND WILL BE PERFORMED AS PLANNED AND SPECIFIED.

Quality Control Representative

RECORD OF PREPARATORY AND INITIAL INSPECTIONS

Date of Inspection	Type of Inspection	Definable Feature of Work (Describe)	Report Numbers		Persons Attending Inspection	Was Material and/or Equipment Physically Inspected?
			QA	QA		

Note: This form shall be used by the Contractor to track prep/init inspections. Attach additional results or comments as required.

TRANSMITTAL OF SHOPDRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE <i>(Read instructions on page two prior to initiating this form)</i>	DATE: Mo / Day / Yr / /	TRANSMITTAL NO --
--	-------------------------------	----------------------

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO . DAC	CHECK ONE: <input type="checkbox"/> THIS IS A NEW SUBMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL
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SPECIFICATION SEC NO. <i>(Cover only one section with each transmittal)</i>	PROJECT TITLE AND LOCATION
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ITEM NO.	DESCRIPTION OF ITEM SUBMITTED <i>(Type size, model number/etc.)</i>	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. <i>(See instruction no. 8)</i>	NO. OF COPIES	CONTRACT <u>DOCU</u> SPEC. PARA NO.	REFERENCE <u>MENT</u> DRAWING SHEET NO.	FOR CONTRACTOR USE CODE	VARIATION <i>(See instruction No. 6)</i>	FOR CE USE CODE
a.	b.	c.	d.	e.	f.	g.	h.	i.

REMARKS	I certify that the above submitted items have been reviewed in detail and are correct and in strict compliance with the contract drawings and specifications except as other wise stated. <hr style="width: 80%; margin-left: auto; margin-right: 0;"/> NAME AND SIGNATURE OF THE CONTRACTOR
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SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED <i>(List by Item No.)</i>	NAME, TITLE OF APPROVING AUTHORITY	DATE
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INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required numbers of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288 for each entry on this form.
4. Submittals requiring expeditious handling will be submitted under a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications -- also a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self transmitting, letter of transmittal is not required.
8. When a sample of a material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column I to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated in Section I, Column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

- | | |
|--|--|
| A -- Approved as submitted | E -- Disapproved (See Attached) |
| B -- Approved, except as noted on drawings. | F -- Receipt acknowledged |
| C -- Approved except as noted on drawings.
Refer to attached sheet resubmission required. | FX -- Receipt acknowledged, does not comply
as noted with contract requirements |
| D -- Will be returned by separate correspondence. | G -- Other (<i>Specify</i>) |
10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

APPENDIX D
PROJECT SCHEDULE

**APPENDIX D
PROJECT SCHEDULE
PHASE 1 INTERIM CORRECTIVE MEASURES WORK PLAN
SWMUs 1 and 2
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Task Name	Duration	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	Month 15	Month 16
SWMUs 1 and 2 - ICM	325 days	[Gantt bar spanning all months]															
Notice to Proceed	1 eday	[Task bar in Month 1]															
Delineation Sampling	21 edays	[Task bar in Month 1]															
Laboratory Analysis	21 edays	[Task bar in Month 1]															
ICM Design	129 days	[Gantt bar spanning Months 2-8]															
100 % Design	30 edays	[Task bar in Month 2]															
Design Review	60 edays	[Task bar in Month 2]															
Final Design	30 edays	[Task bar in Month 3]															
Final Design Approval	60 edays	[Task bar in Month 4]															
Contractor Planning Documents	130 days	[Gantt bar spanning Months 2-9]															
Draft Documents	30 edays	[Task bar in Month 2]															
Review	60 edays	[Task bar in Month 2]															
Final Documets	30 edays	[Task bar in Month 3]															
Planning Document Approval	60 edays	[Task bar in Month 4]															
Cleanup Action	20 days	[Gantt bar spanning Month 8]															
Mobilization	20 edays	[Task bar in Month 8]															
Survey	2 edays	[Task bar in Month 8]															
Debris Removal and Staging	2 edays	[Task bar in Month 8]															
Transportation and Off-Site Disposal	2 edays	[Task bar in Month 8]															
Site Revegetation	1 eday	[Task bar in Month 8]															
Demobilization	2 edays	[Task bar in Month 8]															
ICM Final Report	139 days	[Gantt bar spanning Months 9-15]															
Draft	44 edays	[Task bar in Month 9]															
Report Review	60 edays	[Task bar in Month 9]															
Final Report	30 edays	[Task bar in Month 10]															
Report Approval	60 edays	[Task bar in Month 11]															