N60087.AR.003460
NAS BRUNSWICK
5090.3a

FINAL ACCIDENT PREVENTION PLAN FOR MUNITIONS AND EXPLOSIVES OF CONCERN INVESTIGATION/REMOVAL ACTION AT SITE 12 EOD AREA NAS BRUNSWICK ME

9/1/2013

USA ENVIRONMENTAL INC

FINAL

ACCIDENT PREVENTION PLAN

FOR

SITE 12 EOD AREA

FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Submitted to:

Naval Facilities Engineering Command Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511

Submitted by:
USA Environmental, Inc.
720 Brooker Creek Boulevard, Suite 204
Oldsmar, Florida 34677

Navy Munitions Response Actions (MRA)
Contract No. N62470-11-D-8007
Task Order WE01

Revision 1: September 2013

Reviewed by:

Robert Crownover
Director of Safety and Quality

FINAL - Accident Prevention Plan
MEC Investigation/Removal Action
Site 12 EOD Area – Former NAS Brunswick
Revision 1: September 2013

1

ACCIDENT PREVENTION PLAN

Accident Prevention Plan/Site Health and Safety Plan Acknowledgment			
I have read, understand, and agree to abide by the provisions as detailed in this Accident Prevention Plan and Site Health and Safety Plan (SHSP) prepared by USA Environmental, Inc. Failure to comply with these provisions may lead to disciplinary action and/or my dismissal from the work site.			
Printed Name	**Company**	**Signature**	**Date**

This page is intentionally left blank.

TABLE OF CONTENTS

LIST OF TABLES

This space is intentionally left blank.

This page is intentionally left blank.

ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	Asbestos-Containing Material
at adj	adjusted air temperature
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
ASI	Aqua Survey, Inc.
bpm	beat per minute
CFR	Code of Federal Regulation
CHSM	Corporate Health and Safety Manager
CIRS	Contractor Incident Report System
CP	competent person
CPR	Cardiopulmonary Resuscitation
CSP	Certified Safety Professional
dBA	decibel Ampere
DDESB	Department of Defense Explosives Safety Board
EM	Engineer Manual
EMR	Experience Modification Rate
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
ERCP	Emergency Response Plan and Contingency Procedures
ESAMS	Enterprise Safety Applications Management System
EZ	Exclusion Zone
ft	foot, feet
HAZWOPER	Hazardous Waste Operations and Emergency Response
HIV	Human Immunodeficiency Virus
HTRW	Hazardous Toxic or Radioactive Waste
IBD	Inhabited Building Distance
IDLH	Immediately Dangerous to Life and Health
IVS	Instrument Verification Strip
MEC	Munitions and Explosives of Concern
MIDLANT	Mid-Atlantic
mph	mile per hour
MPPEH	Material Potentially Presenting an Explosive Hazard
MSDS	Material Safety Data Sheet
NASB	Naval Air Station Brunswick
NAVFAC	Naval Facilities Engineering Command
NIOSH	National Institute for Occupational Safety and Health
NTR	Navy Technical Representative
OJT	On-the-job Training
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PDS	personnel decontamination station

PEL	Permissible Exposure Limit
POC	Point of Contact
PPE	Personal Protective Equipment
PR	pulse rate
QC	Quality Control
REL	Recommended Exposure Limit
RPM	Remedial Project Manager
SHSP	Site Health and Safety Plan
SI	Site Inspection
SOW	Statement of Work
SUXOS	Senior Unexploded Ordnance Supervisor
TBD	To Be Determined
TEU	Technical Escort Unit
TLV	Threshold Limit Value
TP	Technical Paper
TWA	time-weighted average
USA	USA Environmental, Inc.
UL	Underwriters Laboratories
UXO	Unexploded Ordnance
UXOSO	Unexploded Ordnance Safety Officer
WBGT	Wet Bulb Globe Temperature

This space is intentionally left blank.

1.0 SIGNATURE SHEET

ACCIDENT PREVENTION PLAN

MEC INVESTIGATION/REMOVAL ACTION AT SITE 12 EOD AREA
FORMER NAS BRUNSWICK
BRUNSWICK, MAINE

1.1 PLAN PREPARED BY:

Cheryl M. Riordan Date: 9/23/13

Cheryl M. Riordan, CSP
Corporate Health and Safety Manager
USA Environmental, Inc.
(757) 689-4737

1.2 PLAN APPROVAL:

Jonathan Chionchio Date: September 23, 2013

Jonathan Chionchio
President
USA Environmental, Inc.
(813) 343-6350

1.3 PLAN CONCURRENCE:

Robert K. Crownover Date: 9/23/13

Robert Crownover
Director of Safety and Quality
USA Environmental, Inc.
(813) 343-6364

This page is intentionally left blank.

2.0 BACKGROUND INFORMATION

This Accident Prevention Plan (APP) has been prepared by USA Environmental, Inc. (USA) for the Munitions and Explosives of Concern (MEC) Investigation/Removal Action work that will occur at the Site 12 EOD Area of the Former NAS Brunswick in Brunswick, Maine. The purpose of this APP is to establish site-specific safety and health procedures, practices, and equipment to be implemented and used to protect affected personnel from the potential hazards associated with the field activities to be performed at the project site. The APP assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted during the MEC Investigation/Removal Action process. The APP will interface with the USA Corporate Safety and Health Program.

2.1 CONTRACTOR

USA Environmental, Inc.
720 Brooker Creek Boulevard, Suite 204
Oldsmar, FL 34677

2.2 CONTRACT NUMBER

N62470-11-D-8007, CTO WE01

2.3 PROJECT NAME

MEC Investigation/Removal Action
Site 12 EOD Area
Former NAS Brunswick
Brunswick, Maine

2.4 PROJECT DESCRIPTION

The Former NAS Brunswick at one time occupied approximately 3,200 acres in Brunswick, Cumberland County, approximately 25 miles northeast of Portland, Maine. The installation is located south of U.S. Route 1, approximately 2 miles east of Brunswick's main business district, and 5 miles inland from the Atlantic Ocean. The Site 12 EOD Area is a 112.7-acre site located in the southeastern portion of the installation. The site boundary is based on the 1,250-ft Inhabited Building Distance (IBD) established as the range limit. The site is located in a remote, open, upland area on Buttermilk Mountain, approximately 1,285 ft south of the recently constructed Marine Corps Armed Forces Reserve Center Building. An elongated pond, roughly 1.5 acres, is situated on the eastern portion of the site.

The site currently has a 5- to 6-ft tall, three-sided earthen berm area approximately 60 ft long by 100 ft wide that occupies approximately one-half of the area suspected of being a former sand/gravel pit. A dumpster within the berm area, historically used for flashing small quantities of explosives and/or propellants such as grenade fuzes, was removed from the site in the 1990s. One control bunker, located approximately 200 ft southwest of the current earthen berm, was occupied by military personnel during detonation of explosive charges.

Historical aerial photographs of the Site 12 EOD Area dating from 1958 to 2006 were reviewed as part of the Preliminary Assessment (PA) Addendum (Malcolm Pirnie, 2007). Several areas in the southeastern portion of the site appear to resemble demolition craters. On two photographs, dated May 1992 and November 1993, there appear to be two areas surrounded by berms; the existing bermed area, and another located directly southeast sharing a portion of the existing berm structure as part of its embankment. In addition to the PA Addendum historical aerial photographs, imagery dated April 28, 2001, shows five pits located inside the existing berm area that are most likely related to detonation operations that took place.

Historical aerial photographs were again reviewed during the Site Inspection (SI) to establish the approximate locations of two historical berms directly southeast and east-southeast of the current berm. For the SI, the primary focus of the investigation was the entire berm area (both historical and existing) that had been used for planned demolition operations, including the surrounding area where kick-outs and munitions fragments may have landed. Kick-outs may result when munitions items are not consumed during explosive disposal operations but instead are thrown from the detonation area by the force of the explosion.

The Site 12 EOD Area is currently closed and not in use. Naval Air Station Brunswick (NASB) is in the closure process. Potential future land use is unknown at this time; however, it is anticipated that the site will remain under the ownership and control of the Navy until the response actions are complete and that site access will remain restricted during this time. No construction or other activities are planned at Site 12 EOD Area concurrently with the proposed investigation/removal action activities. Once the response actions are completed, the site will then be transferred outside of Navy control. Details of the site are provided in Table 2-1.

Table 2-1: Site Description

Site Location	Approximate Size (Acres)
Site 12 EOD Area – Former NAS Brunswick	112.7
Topography	**Present Usage**
☒ Forested ☐ Tillage ☐ River/Creeks ☐ Grassland ☐ Flatland ☐ Open Terrain ☒ Wetland ☐ Arid ☒ Other: A pond and a berm	☐ Rural ☐ Commercial ☐ Urban ☐ Government ☐ Industrial ☐ Farming ☐ Ranching ☐ Residential ☐ Recreational ☐ Military ☒ Other: Owned by Navy, but not currently in use. Will eventually be transferred under BRAC

2.5 CONTRACTOR ACCIDENT EXPERIENCE

USA's Experience Modification Rate (EMR) for the last 5 years is shown in Table 2-2. A copy of the latest Occupational Safety and Health Administration (OSHA) Form 300 is provided in Appendix A.

Table 2-2: Experience Modification Rate

Year	Interstate	Intrastate
2013	0.94	N/A
2012	0.90	N/A
2011	0.86	N/A
2010	0.72	N/A
2009	0.72	N/A

2.6 PHASES OF WORK REQUIRING ACTIVITY HAZARD ANALYSIS

The following phases of work on this project require an Activity Hazard Analysis (AHA):

- Instrument Verification Strip (IVS)
- Location, Survey and Mapping
- Vegetation Removal
- MEC Investigation
- Material Potentially Presenting an Explosive Hazard (MPPEH) Inspection and Certification
- MEC Disposal
- Identifying Asbestos Containing Material (ACM)
- Biological Survey
- Boat Operations/Pond Benthic Study
- Draining of Pond
- MEC Investigation of Debris Piles
- Vehicle Operations
- Quality Control.

The AHA forms are located in Appendix B of this APP. Table 2-3 provides a list of hazards and corresponding Action Levels.

Table 2-3: Hazards Table

HAZARDS*	ACTION LEVELS**
Safety: include falling (rocks, inclines, slippery surfaces, excavations); climbing (uneven terrain); walking (uneven terrain, surface indentations); hand and power tool operations, eye and face hazards (vegetation removal operations); and MEC.	None/Awareness/Avoidance
Chemical: Lubricants and fuels for equipment; Asbestos-Containing Material (ACM) within construction debris.	Per Material Safety Data Sheets (MSDSs)
Physical: include temperature extreme injuries, severe weather conditions, and noise.	Per Monitoring Requirements
Radiological	Not Applicable
Biological Hazards: may be present; include biting and stinging insects, hazardous plants and wildlife.	None/Awareness/Avoidance
MEC: may be present on site; use approved measures.	Observe Safety Procedures

Notes to Hazards Table:

*HAZARDS

Safety:

Falling: (e.g., Open pits; wells; shafts; rocks crevices; steep inclines; slippery surfaces; etc.)

Climbing: (e.g., Falls from structures > 4 ft high; deteriorated ladders or missing rungs; etc.)

Walking or Debris: (e.g., Uneven terrain; animal burrows; surface indentations; exposed nails; broken timbers; sharp protruding objects; broken glass; metal fragments; etc.)

Confined Space (e.g., Excavations > 4 ft deep; surface/underground utility vaults; open surface tanks/cisterns/septic tank; underground/above ground storage tanks; etc.)(DO NOT ENTER)

Water: (e.g., Moving waterways (Flash Floods); drowning/near drowning conditions or environments; etc.)

Eye Hazards: (e.g., Airborne dust/windy conditions; liquid splashes; etc.)

MEC/Other: (e.g., Explosives; combustible or flammable materials; etc.)

Chemical: Evaluate the chemical hazards that may be encountered during site activities for each task. For activities utilizing this plan, encounters with chemicals above the Permissible Exposure Limit (PEL), or Threshold Limit Value (TLV) are not expected. THIS PLAN WILL NOT BE USED IF OVEREXPOSURES OR IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH) CONDITIONS ARE EXPECTED. (List the chemical TLV/PEL/Recommended Exposure Limit (REL); OSHA/National Institute for Occupational Safety and Health (NIOSH) IDLH; odor threshold/warning levels; warning signs/symptoms of overexposure; concentrations expected on site.)

Physical: Evaluate the potential for injury from physical agents such as noise, electricity, moving parts/machinery, heat and cold stress that may be present (e.g., loud machinery; overhead or underground power lines; personal protective clothing, etc.)

Radiological: Evaluate the risk to human health caused by radioactive materials in the area where work is to be performed.

Biological: Evaluate the potential for illness or injury due to biological agents (e.g., poisonous plants, animals, insects, microorganisms, etc.)

MEC: Evaluate exposure; minimize people, time, and amount of hazardous material. Age or condition of Unexploded Ordnance (UXO) DOES NOT decrease hazard. UXO exposed to fire is EXTREMELY hazardous: EVACUATE IMMEDIATELY.

**ACTION LEVELS: Action Levels will typically be defined as requiring site evacuation only if significant hazards are encountered. Note: The activities for which this APP is designed will not typically encounter chemical contaminant or radioactive exposures above background. In the event that chemical or radioactive exposures, which are judged to be significant, are encountered (reasonable potential to exceed permissible exposure limits or encounter IDLH conditions) this plan requires work stoppage of the site, reevaluation, and development of procedures designed by Safety Management that will address the potential exposure. Chemical exposures (releases) requiring evacuation will always be in an upwind direction to a safe distance. Personal Protective Equipment (PPE) per hazard assessment will be worn.

This space is intentionally left blank.

3.0 STATEMENT OF SAFETY AND HEALTH POLICY

This APP has been developed in recognition of the responsibilities of USA and the need for management to establish a policy with regard to the prevention of on-the-job injuries. Through application of these safety policies and procedures, it is USA's primary goal to reduce to a minimum the human suffering of employees resulting from occupational injuries. Not only can injuries have a serious physical and emotional impact on the employees themselves but can also have a negative effect on family members and co-workers.

In addition, we must recognize the deterrent and eroding effect injuries have on potential profit. Insurance costs, combined with the indirect costs of injuries, are a matter of serious concern, and it is USA's intention that they be reduced. This desired reduction could take place, over the long term, if the frequency of injuries is kept to a minimum. As it affects USA, the elimination of on-the-job injuries is an important responsibility of management. This responsibility must be assumed and treated in the same manner as our business philosophies relating to services rendered.

For USA's Corporate Safety and Health Program to become effective, it will be necessary for each employee to take a serious interest in the prevention of injuries. Management fully intends to provide, in administration of the program, the leadership and direction to which supervisory personnel and employees will respond. It is USA's earnest request that all concerned devote their serious attention toward making this Safety and Health Program an integral part of the day-to-day business operations. Always remember that no job is so important and no service is so urgent that we cannot take the time to perform our work safely.

All site operations will be performed in accordance with applicable federal, state, and local regulations and procedures, OSHA requirements, client requirements, USA's Corporate Safety and Health Program and this APP. All USA employees will comply with the requirements of this plan.

3.1 SAFETY PROGRAM GOALS, OBJECTIVES, AND ACCIDENT EXPERIENCE GOALS

USA's corporate safety program is designed to provide the safety training and tools required to ensure that USA is providing the safest work environment for its employees, other project personnel, and the general population in areas adjacent to our project sites.

The USA Corporate Health and Safety Manager (CHSM) has reviewed the scope of the project and, based on this review, has developed this APP designed to protect health and safety during the project.

As part of the job requirements, employees must:

- Read and follow the APP and attached SHSP
- Attend health and safety meetings, courses and seminars, when available, to make them more informed and aware of potential hazards that exist at the site.

The goal for USA on this project is zero accidents. All managers and supervisors are responsible for implementing the provisions of this APP and the attached SHSP and for answering team member questions about accident prevention. Management is responsible for ensuring that all safety and health policies and procedures are clearly communicated and understood by all team members. Managers and supervisors are expected to enforce the rules fairly and uniformly. This will be accomplished by:

- Informing team members of the provisions of the Safety and Health Program
- Evaluating the safety performance of all team members
- Recognizing team members who perform safe and healthful work practices
- Providing training to team members whose safety performance is deficient
- Disciplining team members for failure to comply with safe and healthful work practices.

All team members are responsible for using safe work practices, for following all directives, policies and procedures, and for assisting in maintaining a healthful and safe work environment. USA recognizes that open, two-way communication between management and all team members on health and safety issues is essential to an injury-free, productive workplace. To facilitate a continuous flow of health and safety information between all team members, the following will be accomplished:

- Training all new team members during the site-specific training on the site safety and health policies and procedures, which will include this APP and attached SHSP
- Training all new team members on the hazards associated with the job site
- Conducting daily tailgate safety meetings for all team members
- Conducting quarterly refresher type training
- Posting and, if applicable, distributing safety information
- Encouraging open communications.

3.2 USA'S SAFETY INCENTIVE PROGRAM

USA builds an information database for each project it undertakes, which includes the rate/occurrence of accidents and injuries. Safety data, including injury and accident occurrence, are noted and incentives such as monetary bonuses and additional training courses are provided as rewards for superior employee performance in compliance with the project APP, SHSP, and corporate safety and health policies.

3.3 POLICIES AND PROCEDURES REGARDING NONCOMPLIANCE WITH SAFETY REQUIREMENTS

USA management takes seriously employee noncompliance with safety requirements. Personnel not following procedures are warned and counseled in the proper safety procedures, and if the problem persists, are again counseled with notations made in their employee record. Continued noncompliance will lead to termination. On USA job sites, visitors are briefed about site safety requirements and are provided with the appropriate level of Personal Protective Equipment (PPE). If visitors refuse to follow these procedures, they will be escorted from the site.

3.4 USA'S WRITTEN PROCEDURES FOR HOLDING MANAGERS AND SUPERVISORS ACCOUNTABLE FOR SAFETY

USA's commitment to health and safety is documented and adherence is required from the time an offer is made to a job applicant. Managers and supervisors are made responsible for enforcing health and safety as part of their job descriptions. They are ultimately responsible for protecting the welfare of the employees as well as minimizing the potential liability associated with on the job accidents.

This space is intentionally left blank.

4.0 RESPONSIBILITIES AND LINES OF AUTHORITY

All personnel are responsible for continuous adherence to this APP and health and safety procedures during the performance of their work.

4.1 IDENTIFICATION AND ACCOUNTABILITY OF PERSONNEL RESPONSIBLE FOR SAFETY

No person may work in a manner that conflicts with the intent of, or the inherent safety and environmental precautions expressed in, these procedures. After due warnings, USA will dismiss from the site any person who violates safety procedures. USA employees are subject to progressive discipline and may be terminated for continued violations. All on-site personnel will be trained in accordance with this document.

4.1.1 USA Program Manager – Doug Ralston

Responsibilities include:

- Ensuring conformance with USA corporate, and other Regulatory policies and procedures
- Coordinating project with the client Manager
- Ensuring the project has the necessary resources to operate safely
- Ensuring that the project personnel satisfy USA, and Regulatory, Safety and Health requirements.

4.1.2 USA Project Manager – Robert Hierholzer

Responsibilities include:

- Coordinating with USA Program Manager and client Project Manager
- Providing management of all aspects of project work
- Setting the tone for safety on the job site
- Ensuring personnel have the equipment, training, and resources to perform the job safely
- Ensuring that the project personnel implement the project APP
- Ensuring that the project personnel have the appropriate regard for safe job performance.

4.1.3 USA Corporate Health and Safety Manager – Cheryl M. Riordan, CSP

Responsibilities of the CHSM include:

- Developing, maintaining and implementing the APP/SHSP as required
- Performing Safety Program audits as required
- Providing consultation to Project Managers and Project Engineers
- Making changes to the APP/SHSP if warranted by changed conditions
- Evaluating occupational exposure monitoring/air sampling data and adjusting APP/SHSP requirements as necessary
- Administering and enforcing the General Health and Safety Program
- Determining the level of personnel protection required
- Conducting field health and safety audits to ensure Health and Safety Plan conformance and USA policy compliance
- Investigating significant accidents and illnesses and implementing corrective action plans
- Certifying that all workers have proper training as per OSHA 29 Code of Federal Regulation (CFR) 1910.120(e)
- Updating equipment or procedures based on information obtained during site operations

- Establishing air monitoring parameters based on expected contaminants
- Establishing employee exposure monitoring notification programs
- Developing site specific employee/community emergency response plans based on expected hazards
- Stopping any operation that threatens the health or safety of the team or surrounding population
- Confirming each USA team member's suitability for work based on physician's recommendation
- Upgrading or downgrading levels of protection based on site observations or monitoring results
- Providing technical, analytical, and report writing support to ensure the technical quality of deliverables to the customer.

4.1.4 Senior UXO Supervisor (SUXOS) – Brian Thompson

All site activities will be conducted under the supervision of the USA SUXOS. The SUXOS will oversee normal and emergency work and will perform any emergency notification. The SUXOS is also responsible for:

- Supervising all USA site activities
- Implementing the field APP
- Coordinating with the UXO Safety Officer (UXOSO) on safety-related matters
- Determining evacuation routes
- Presenting daily safety meetings
- Maintaining logs and records in the field
- Implementing changes to this APP as directed by the CHSM or UXOSO.

4.1.5 UXO Safety Officer – Charles Bobo

Site activities will be conducted under the supervision of the USA UXOSO for safety on an as-needed basis. The UXOSO will act as safety oversight for normal and emergency work and will perform any emergency notification as the On-Scene Incident Commander. For this project the UXOSO will be a dual hatt responsibility with UXO quality control supervisor (UXOQCS). The UXOSO is also responsible for:

- Implementing and enforcing all provisions of the field APP/SHSP
- Providing daily inspections of site activities to identify safety and occupational health deficiencies and ensure corrective action
- Coordinating and implementing changes to the APP/SHSP, as directed by the CHSM
- Conducting project-specific training for site personnel and visitors
- Determining evacuation routes
- Presenting daily safety meetings
- Maintaining safety logs and records in the field
- Enforcing the level of personnel protection required
- Investigating work-related accidents and illnesses and implementing corrective action plans
- Performing air-monitoring based on expected contaminants
- Implementing employee exposure monitoring notification programs
- Stopping any operation that threatens the health or safety of the team or surrounding population
- Upgrading levels of protection based on site observations or monitoring results.

4.2 LINES OF AUTHORITY

Figure 4-1 details the project organizational structure and Table 4-1 lists contact information for project personnel.

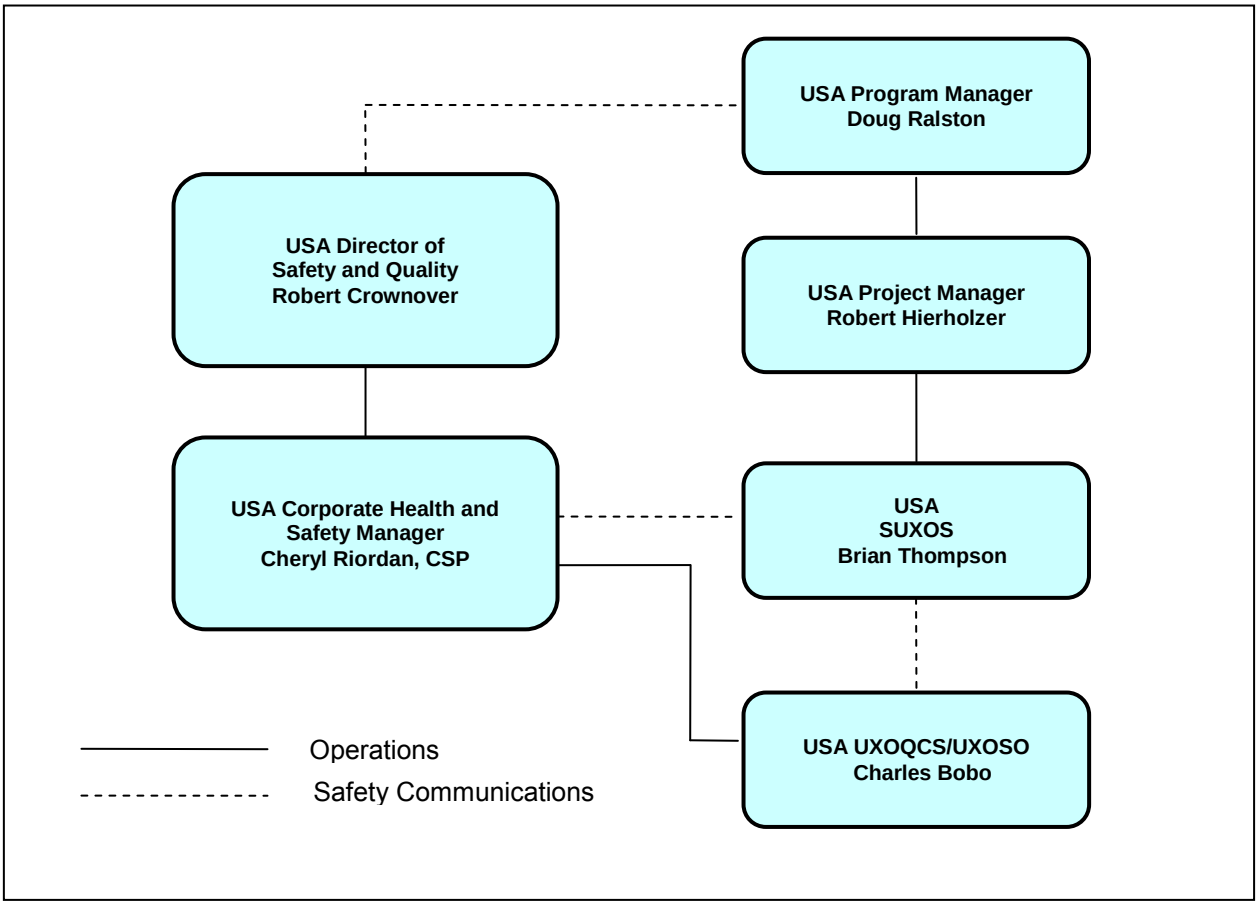


Figure 4-1: Organizational Structure

Table 4-1: Project Contacts

Title	Name	Responsibility	Phone No.
NAVFAC MIDLANT Remedial Project Manager	Todd Bober	Project Management	(215) 897-4911
Program Manager	Doug Ralston	Program Management	813-343-6368
Corporate Health and Safety Manager	Cheryl M. Riordan, CSP	Plan Preparation	813-426-2112
Project Manager (PM)	Robert Hierholzer	Project Management	813-925-6732
UXO Quality Control Specialist/UXO Safety Officer	Charles Bobo	On-site Safety and Occupational Health Authority	813-343-6336
Senior UXO Supervisor (SUXOS)	Brian Thompson	Supervises all site activities	813-777-3292

Title	Name	Responsibility	Phone No.
Former NASB Navy Caretaker	Robert LeClerc	Navy Primary Site POC	207-263-6736
Navy Remedial Construction Specialist	Joe Gallant	Navy Secondary Site POC	207-252-7353
Parsons	Todd Belanger	Field Sampling	202-591-6826

This space is intentionally left blank.

5.0 SUBCONTRACTORS AND SUPPLIERS

5.1 IDENTIFICATION OF SUBCONTRACTORS AND SUPPLIERS

USA will be the prime contractor for this work. USA will be using the following subcontractors for work on this project:

- Aqua Survey, Inc. (ASI) will be providing Pond Benthic Survey, underwater DGM, and sediment thickness probing.
- Parsons will be providing the natural resources survey, wetland delineation survey, sediment sampling, and terrestrial DGM using towed array.
- Spivey Surveying Services will provide Professional Land Survey of the Decision Unit-2 area boundary.
- K&K Excavation, Inc. will be dewatering the pond; operating the long reach excavator; loading and hauling materials such as trees, root balls, construction debris, etc., that are byproducts of the MEC investigation.
- Shaw's Land Clearing, LLC, will be performing vegetation clearance and chipping operations.

5.2 MEANS FOR CONTROLLING AND COORDINATING SUBCONTRACTORS AND SUPPLIERS

The only subcontractors used on this site will be the suppliers of services. ASI, who will be providing the Pond Benthic Survey, will be escorted by a qualified UXO Technician, who will provide UXO support to the operation, as needed.

Parsons personnel performing the Biological Survey will be escorted by a qualified UXO Technician, who will be providing UXO support by clearing the path of entry and providing support for any intrusive operations, to ensure potential subsurface MEC is not disturbed.

The surveyor will be escorted by a UXO Technician, who will be responsible for ensuring his/her safety by providing MEC avoidance while on the site. The UXO technician will be supporting any intrusive operations, such as installing survey lathe, to ensure potential subsurface MEC is not disturbed.

K&K Excavation, Inc. will be escorted by a qualified UXO Technician, who will provide UXO support by clearing the path of entry to the site and providing support for any intrusive operations, to ensure potential subsurface MEC is not disturbed.

Shaw's Land Clearing, LLC, will be escorted by a qualified UXO Technician, who will provide UXO support by clearing the path of entry to the site and providing support for any intrusive operations to ensure potential subsurface MEC is not disturbed.

5.3 SAFETY RESPONSIBILITIES OF SUBCONTRACTORS AND SUPPLIERS

All personnel working on the site must attend the daily safety briefing, which will be held first thing in the morning. This briefing will let personnel know what operations are taking place, where the operations will be occurring, and evacuation routes, in case an evacuation is required. The subcontractors will be under the direct supervision of a minimum UXO Technician II for the entire time they are on the site. The UXO Technician will ensure that the subcontractor personnel working on site are briefed on the site hazards, particularly the MEC site hazards. The subcontractors will be expected to follow all directions received from the UXO Technician.

This space is intentionally left blank.

This page is intentionally left blank.

6.0 TRAINING

Prior to commencement of site activities, the CHSM and the UXOSO will ensure that all USA employees engaged in hazardous waste operations are informed of the nature and degree of exposure to chemical and physical hazards that are likely to result from participation in site operations. USA will accomplish this by ensuring that all personnel entering the site have received the appropriate OSHA and site-specific training, prior to participation in site activities. OSHA-required training will be conducted prior to site mobilization. Site-specific training will be held at the time of site mobilization and will be reinforced during the daily safety briefings, to which all site workers will be required to attend.

6.1 SUBJECTS TO BE DISCUSSED WITH EMPLOYEES DURING SAFETY INDOCTRINATION

The UXOSO will conduct necessary on-the-job training (OJT) for assigned personnel. This training will include classroom-type instruction covering the topics specified for site-specific training, and on-site participation in the following:

- Performance Work Statement
- Details of the APP/SHSP
- Employee rights and responsibilities
- Sequence of work events
- Identification of safety issues for the site
- Identification of Safety staff and lines of authority
- Safe work practices
- Proper lifting techniques
- Recognition of potential MEC and hazards associated with MEC
- Asbestos awareness training
- Nature and extent of anticipated chemical, physical, and biological hazards
- Heat stress/cold stress, including encouraging employees to inform their supervisor of any past heat stress injuries experienced
- Measures and procedures for controlling site hazards
- Emergency Response and Contingency Plan
- Emergency procedures for clean-up of chemical spills
- Location of medical services
- Site communication
- Evacuation routes
- Rules and regulations for vehicle use
- Safe use of field equipment
- Heavy equipment operations
- Waterborne operations
- Handling, storage, and transportation of hazardous materials
- Use, care, and limitations of PPE
- Hazard communication per OSHA 29 CFR 1910.1200.

6.2 MANDATORY TRAINING AND CERTIFICATIONS APPLICABLE TO THIS PROJECT

6.2.1 General Training

All USA employees who are involved in hazardous waste site activities receive 40 hours of OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) training in accordance with 29 CFR 1910.120 and 29 CFR 1926.65. If it has been more than a year since any worker has received the 40 Hour OSHA HAZWOPER training, he/she must also have a current HAZWOPER 8-Hour Refresher Training in accordance with 29 CFR 1910.120 and 29 CFR 1926.65 prior to working on the site. All workers will also receive 3 days of site-specific OJT under the direct supervision of a trained/experienced supervisor when they mobilize at the site. Any visitor entering the Exclusion Zone (EZ) during hazardous waste operations will also be required to have current HAZWOPER training.

All current certifications and training tables for USA personnel will be maintained on site for the duration of the project. Individuals without proper training records will not be permitted to work on site.

6.2.2 Supervisory Training

On-site managers and supervisors, who are responsible for directing others, will receive the same training as the general site workers for whom they are responsible. He/she will also receive an additional 8 hours of OSHA-required HAZWOPER supervisory training in accordance with 29 CFR 1910.120 and 29 CFR 1926.65 to enhance their ability to provide guidance and make informed decisions. This additional training includes the following:

- Review of the USA Corporate Safety and Health Program
- Regulatory requirements
- Management of hazardous waste site cleanup operations
- Management of site work zones
- How to communicate with the media and the public
- PPE selection and limitations
- Spill containment
- Monitoring site hazards.

The UXOSO, with specific responsibilities for safety and health guidance on site, will receive the training provided to general site workers and their supervisors. He also will receive advanced training in safety and health issues, policies and techniques. The UXOSO will also receive the 30-hour OSHA Construction Safety class in accordance with Engineer Manual (EM) 385-1-1, 01.A.17.

6.3 REQUIREMENTS FOR EMERGENCY RESPONSE TRAINING

Prior to commencement of the project, all USA site personnel will review and discuss the posted emergency telephone numbers, location of spill kit materials as applicable, directions to the nearest hospital, the location of all site fire extinguishers, proper use of fire extinguishers, the location of first aid kits and blood-borne pathogens kits, and review of the emergency procedures.

6.3.1 Fire Prevention

Smoking and lighters will be prohibited in the EZ or work zone. A cigarette butt receptacle will be provided in the support zone. No cigarette butts will be discarded on the ground. No smoking will be allowed except in an approved designated location with fire extinguisher. Procedures will be reviewed with all site personnel.

6.3.2 MEC Training

All USA UXO Technicians meet the requirements for performing MEC operations. All USA employees performing work involving the handling and destruction of MEC will meet the requirements of Department

of Defense Explosives Safety Board (DDESB) Technical Paper (TP) 18 (TP-18 Table 4.1). A copy of their certificate of graduation will be kept on file at corporate headquarters. UXO qualified personnel will have knowledge and experience in military ordnance, ordnance components and explosives location, identification, render safe, recovery/removal, transportation, and disposal safety precautions. UXO personnel will have the knowledge and experience to effect safe handling and transportation of ordnance items found. Copies of certificates of this training will be kept on the project site for the duration of site operations.

6.3.3 Hazard Communication

All USA employees who will be performing work involving the handling of hazardous materials will receive Hazard Communication training detailing the hazards of the product, appropriate protective measures (including PPE) to prevent exposure to the product, as well as safe procedures for storage and handling of the product, and response to emergencies. Personnel may request an MSDS for any hazardous material on the site at any time. USA personnel will be informed of the location of the MSDSs. The MSDS binder will be kept in the UXOSO site vehicle. This training will occur as part of the initial mobilization training at the site. Per the written USA Hazard Communication Program, a Hazardous Materials Inventory will be maintained on the site, a storage site for hazardous materials will be designated, and all hazardous materials will be properly labeled.

6.3.4 Heavy Equipment Operations

Heavy equipment operators will receive training on each piece of heavy equipment operated on the site. Certificates of training will be available on the site for the duration of project operations. After the site work is completed, certificates will be maintained in the USA Corporate Office in Oldsmar, FL. All site personnel working in the vicinity of heavy equipment operations will be given training in the hazards of working around heavy equipment as part of the mobilization training.

6.3.5 Asbestos Awareness Training

Areas of the site contain construction debris, which creates the potential for ACM. All personnel working on the site will be required to have asbestos awareness training. This training will include how to recognize potential ACM (roofing materials, tiles and insulation materials); the hazards of asbestos exposures; protective measures; and procedures to follow should this material be encountered. This training will occur as part of the initial mobilization training at the site.

6.4 REQUIREMENTS FOR SUPERVISORY AND EMPLOYEE SAFETY MEETINGS

6.4.1 Tailgate Safety Briefing

Tailgate Safety Briefings will consist of providing short training sessions in various subjects that give the site worker knowledge and confidence in performing duties in a potentially hazardous environment. The Tailgate Safety Briefing will be given prior to commencing work each day and will include such items as:

- Expected weather conditions
- General site hazards
- Biological hazards on site
- MEC hazards
- ACM hazards
- PPE required at each site
- Emergency evacuation procedures
- AHAs for site operations

- Heat stress/cold stress precautions, including the importance of workers informing their supervisors of past experience with heat stress injuries so that supervisors can monitor them more closely while working in a hot environment.
- Buddy system procedures
- A review of any safety violations from the previous day
- Any other significant events involving safety.

Additional briefings will be provided, as needed, concerning the use of safety equipment, emergency medical procedures, emergency assistance notification procedures, accident prevention, the work plan, and site orientation to ensure that accomplishment of the project can be carried out in a safe and effective manner. All site workers are required to attend the tailgate safety briefing daily.

6.4.2 Daily Debriefing

At the conclusion of each workday, a debriefing for all employees will be held, if appropriate, and the day's work will be discussed to determine if changes are warranted before commencing activities the following day.

6.4.3 Periodic Site Training

On the first workday of each work week/period, or more frequently if needed, a pertinent topic will be selected and elaborated upon by the UXOSO during the Tailgate Safety Briefing. These safety meetings will help ensure the safety and health of site personnel in the performance of regular work activities and in emergency situations. Safety meetings will be documented in the appropriate log and the Documentation of Training Form will be completed.

The UXOSO will conduct a site workers basic safety briefing at the beginning of each week or when new employees arrive at the job site once the job has commenced. The following is a general list of what will be discussed:

- Names and titles of key personnel responsible for site safety and health, and other hazards present at the site
- Components of the APP/SHSP
- General site safety
- Hazards and symptoms of contaminant exposure (chemical) as applicable
- Routes of exposure from on-site contaminants (as applicable)
- Physical hazards (fall protection, noise, heat stress, cold stress, etc.) to include the importance of workers informing their supervisors of past experience with heat stress injuries
- Biological hazards
- Location and availability of written hazard communication program
- Site and activity PPE (including purpose, donning, doffing and proper use)
- Activity Hazard Analyses (AHAs) for site operations
- Work practices by which employees can minimize risks for hazards
- Safe use of engineering controls and equipment use
- Heavy equipment operations safety
- Site control measures
- MEC suspected on site
- ACM recognition and awareness
- MEC/UXO hazards and precautions
- Reporting requirements for UXO, spills, and emergencies

- Personnel decontamination procedures (as applicable)
- Contingency plans (communications, phone numbers, emergency exits, assembly points, etc.)
- Worker Right to Know/Hazard Communication
- Emergency equipment locations and use (fire extinguishers, spill kits, first aid kits, etc.)
- Equipment safety.

6.4.4 Visitors

All visitors to the site, even if escorted, must receive, as a minimum, a briefing about on-site conditions, hazards, and emergency response procedures. The UXOSO will generally be the one providing the visitor briefing. All visitors to the EZ will be escorted at all times. When visitors who are not UXO qualified enter the EZ, all MEC operations will cease, and will resume again after the visitor has left the EZ. Visitors will not be permitted in the restricted work areas unless they have the appropriate level of OSHA training, and are medically approved as part of a company-sponsored medical surveillance program. Visitors not complying with the above requirements will not enter the restricted work areas; however, they may observe site conditions from a safe distance in the support zone. All visitors will sign the Visitor's Log prior to entering the site.

6.4.5 Training Documentation

A training record will be kept in each employee's individual file to confirm that adequate training for assigned tasks is provided and that training is current. In addition, Documentation of Training Forms will be completed and kept on file at the work site for the duration of site activities, and made available for inspection upon request.

This space is intentionally left blank.

This page is intentionally left blank.

7.0 SAFETY AND HEALTH INSPECTIONS

General safety and health inspections are described throughout this APP. USA site personnel will conduct safety inspections on a daily basis, or more frequently if conditions warrant. The UXOSO will be responsible for daily safety inspections of the project. In addition to extensive site experience, the UXOSO has also received the OSHA 30-hour Construction Safety training, as well as specific safety training from the USA Corporate Safety office. During periods when the UXOSO is not present, the Senior UXO Technician who is present will ensure that site personnel follow safety requirements and policy. The Senior UXO Technician also receives safety training from the USA Corporate Safety Office.

The Safety Inspection Form will be used to record, track, and provide follow-up to ensure that safety deficiencies are corrected after they have been identified. A record of the safety inspection checklist will be maintained in the project file. Deficiencies will be identified, posted, and dated when the deficiencies are rectified.

USA Corporate Safety staff, all of whom have advanced training in safety and health responsibilities, may conduct periodic safety program audits at project sites, which will include an inspection of site conditions and operations.

7.1 EXTERNAL INSPECTIONS/CERTIFICATIONS

External inspections are expected for this project. The NAVFAC MIDLANT RPM and/or other NAVFAC representatives may choose to conduct external inspections.

This space is intentionally left blank.

This page is intentionally left blank.

8.0 ACCIDENT REPORTING

This section provides the requirements for implementing the accident reporting provisions of USA. This APP requirement applies to all work performed by USA for each project.

Should an accident or mishap occur on the site, regardless of the severity, it will be fully investigated by USA and all reports and records will be documented on the USA Accident Report Form and/or the Contractor Incident Report System (CIRS). Copies will be maintained on site for the duration of site activities. A permanent copy will be maintained in USA's Oldsmar, Florida, office. Accidents/incidents will be reported in accordance with EM 385-1-1. All accident/incident reports will be reviewed by the CHSM to ensure all root causes of the accident/incident have been adequately addressed in order to prevent future recurrences on this or any other project sites.

The USA Project Manager and the USA CHSM will be notified immediately by telephone of any accidents, and will follow up with USA's Accident Report Form. USA's Project Manager will notify the NAVFAC RPM immediately and fill out and submit the Accident Report Form and/or the CIRS to the NAVFAC Contracting Officer or designated representative for review within one working day after the event. USA will thoroughly investigate all accidents.

Any accident involving a fatality or three or more hospitalizations from the same incident will be reported telephonically to the nearest Federal and state OSHA Area office within 8 hours by the CHSM. If all information is not known at that time, an initial report will be made and a follow-up report will be submitted after all of the facts are documented.

Person(s) who become ill or injured during work activities must immediately inform the SUXOS or UXOSO, regardless of the severity of the illness or injury. The victim(s) will be decontaminated if the injury occurred in contaminated areas. In the event that the medical emergency is severe enough, the SUXOS or UXOSO will order a cessation of work and notify off-site emergency personnel. All personnel at the work site will use the buddy system, staying within sight of their partner. If a partner becomes incapacitated or severely ill, Emergency Medical Services (EMS) will be notified. In the event that a cessation of work is ordered, all personnel should:

- Assist the UXOSO, if required, in decontaminating the victim and/or administering first aid
- Leave the contaminated area and undergo decontamination prior to entering the worker rest area
- Assist emergency response personnel when requested.

In the event of an accident that results in a lost workday or $20,000 or more in property damage, an accident report will be completed and submitted within five workdays, and a copy will be provided to the client contact.

All workers receiving medical treatment, other than first aid, by a medical professional will obtain a medical release on the date of treatment stating one of the following: (1) the employee is not fit for duty; (2) the employee is fit for restricted duty; or (3) the employee is fit for duty. A copy of the release will be attached to the accident report and submitted to the NAVFAC RPM.

8.1 NAVFAC ACCIDENT REPORTING REQUIREMENTS

For all OSHA recordable mishaps, the following steps will be taken.

- USA will make a verbal report to the Navy RPM as soon as possible, or within 2 hours, with as much information as is available at that time.
- The RPM will enter the basic contractor contract data into the CIRS module in Enterprise Safety Applications Management System (ESAMS) within 8 hours. A hyperlink and password will be subsequently sent to the identified USA point of contact (POC) for completing the CIRS via ESAMS.

- The RPM will complete the NAVFAC Mishap Heads-Up and Initial Notification form and email it to the NAVFAC MIDLANT Safety Manager for review.
- The USA POC will enter the ESAMS system using the hyperlink and password provided by the system automatic email. USA will then complete a CIRS within 5 calendar days. The CIRS will be sent via email to the RPM for review. USA will provide updates to the CIRS as information becomes available.
- The RPM will review the CIRS for the Minimum Notification Content and resolve any issues or concerns.
- The NAVFAC MIDLANT Safety Manager will ultimately accept the mishap or send it back for revision or update.

8.2 EXPOSURE DATA

All work-related incidents occurring to USA employees should be reported for statistical purposes. All recordable incidents count against USA's recordable incident experience when they occur to either an employee or a subcontractor working under the direct supervision of USA's SUXOS. Personnel man-hours will be defined as hours worked by all persons assigned to the project, including subcontractor employees under direct supervision of USA's SUXOS. These man-hours will be annotated on the Daily Operations Summary and/or the Weekly Operations Summary forms and transmitted to the Project Manager. The USA UXOSO will document and review with the CHSM the potential exposure data versus the man-hours worked per day to evaluate the association to site accidents or injury. The most current OSHA 300 form will be posted on site and is presented in Appendix A of this APP.

8.3 ACCIDENT INVESTIGATIONS, REPORTS, AND LOGS

Investigation and documentation of emergency responses will be initiated by the UXOSO. This is important in all cases, but especially so when the incident has resulted in personal injury, property damage, or environmental impact. The documentation will be a written report and will include the following:

- Accurate, concise and objectively recorded information
- Authentic Information: Each person making an entry must sign and date that entry. Nothing is to be removed or erased. If details are changed or revised, the person making the change should strike out the old material with a single line and initial and date the change.
- Titles and names of personnel involved
- Actions taken, decisions made, orders given; to whom, by whom, when, what, where, and how, as appropriate
- Summary of data available
- Possible exposure of personnel
- Copies of the Employer's Report of Occupational Injury or Illness (OSHA 300) or the USA Accident Report or CIRS, as appropriate, will be completed and forwarded to the CHSM.

All accidents will be investigated and immediate steps will be taken to prevent recurrence. The client will be notified of any accidents occurring on this project site. Should an accident occur on the site, all reports and records will be documented. Copies will be maintained on-site for the duration of site activities. A permanent copy will be maintained in the USA Corporate Office.

8.4 IMMEDIATE NOTIFICATION OF MAJOR ACCIDENTS

An accident that has, or appears to have had, any of the following consequences will be immediately reported to the NAVFAC Contracting Officer and/or RPM:

- A fatal injury or illness
- Permanent totally disabling injury or illness

- Permanent partial disabling injury or illness
- Three or more persons being hospitalized as inpatients as a result of a single occurrence
- $20,000 or more in accidental property damage
- Possible adverse publicity to NAVFAC.

Immediate notification will be made to the NAVFAC RPM and Navy Technical Representative (NTR) verbally or by email. The reporting requirement of submitting the Accident Report Form or CIRS within 5 working days still applies. Follow the steps in Section 8.1, "NAVFAC Accident Reporting Requirements," above.

Except for rescue and emergency measures, the accident scene will not be disturbed until it has been released by the investigating official.

This space is intentionally left blank.

This page is intentionally left blank.

9.0 PLANS, PROGRAMS, AND PROCEDURES

The following subsections describe the plans, programs, and procedures that will be used during site operations.

9.1 LAYOUT PLANS

NA

9.2 EMERGENCY RESPONSE PLANS

The UXOSO will perform pre-emergency planning before starting field activities and during the mobilization and site-specific training phase of the project, and will coordinate emergency response with police/fire/rescue personnel and the nearest hospital. Pre-emergency planning meetings will be used to inform local authorities of the nature of site activities that will be performed under the Statement of Work (SOW) and the potential hazards that activities may pose to site workers, the environment, and the public.

9.2.1 Procedures and Tests

An agreement will be established between USA and emergency response personnel and the hospital regarding responsibilities of each party in responding to a project site emergency. The UXOSO will verify all on-site emergency services information, to include procedures for requesting services. It will be the UXOSO's responsibility to post these procedures and contact information in accordance with the requirements of this APP/SHSP. Pre-emergency planning tasks include:

- Posting of emergency instructions and call numbers at accessible telephone locations
- Inspection of all emergency equipment and supplies to ensure they are in proper working order
- Providing a site map marked with planned evacuation routes, assembly points, and emergency equipment and supplies
- Providing a map with the route to the hospital marked and highlighted, with copies of this map posted in all site vehicles
- Conducting an emergency response drill to test the effectiveness of the Emergency Response Plan and Contingency Procedures (ERCP)
- Reviewing and revising the ERCP in the event of a failure of the plan in an actual or staged emergency, or when changes in site conditions or SOW affect the ERCP
- Before normal activities are resumed, on-site personnel must be prepared and equipped to handle another emergency. The follow-up activities listed below should be completed.
  - The CHSM will notify appropriate government agencies as required. (Reminder: OSHA must be notified if there have been any fatalities or three or more hospitalizations from the same event.)
  - All equipment and supplies should be restocked, serviced and inspected.
  - All aspects of the SHSP should be reviewed and revised as necessary to address and prevent future emergencies of this type.

As part of mobilization training, prior to start of project, all personnel will review the POC list and where it is posted as well as the location of the nearest hospital. A meeting place off-site will be identified in case of emergency evacuation. The emergency evacuation responsibilities of all persons on-site will be identified. All personnel will review the locations of fire extinguishers and be competent to use one properly. All emergency telephone numbers will be posted next to the directions to the hospital map on site.

9.2.2 Spill Plans

USA will conduct clean-up operations in the event of a spill of hazardous material (e.g., fuel or oil from UXO field operations). The UXOSO will manage the collection of the spilled material with absorbent pads

and containerize the pads or materials within Department of Transportation-approved drums for disposal as potential contaminated hazardous waste. A complete spill kit will be maintained on site when spills are a potential hazard. Chemicals brought to the site will be in small quantity containers, in order to limit the amount of material spilled, should a spill occur. As part of mobilization training, all site personnel will be trained in the procedures for cleanup of small spills.

In the event of a spill or leak of any potentially harmful material (regardless of quantity), on-site personnel will take the following steps.

- Notify the UXOSO immediately.
- The UXOSO will notify the Project Manager of the spill/leak with relative information (location, time, chemical identity, quantity, hazards listed on the MSDS), and any corrective actions/measures taken.
- Locate the source and stop the leak/spill if it can be done safely (as dictated by the UXOSO).
- Begin containment and recovery of spilled material (as directed by the UXOSO), using appropriate PPE and spill clean-up equipment and materials.
- Determine if quantities meet or exceed the reporting requirements of federal or State EPA for spills.
- Once notified, the Project Manager will in turn notify the NAVFAC RPM and the Contracting Officer. The NAVFAC RPM may advise USA if any additional actions are necessary.

9.2.3 Firefighting Plans

In the event of a fire or explosion, the UXOSO will notify the police, fire department, and ambulance, as required. The UXOSO will also contact the NAVFAC site representative and Project Manager, and escort the response personnel to the location of the fire or explosion. The UXOSO will determine the extent of the fire, coordinate and manage fire suppression efforts until the fire department arrives, use available on-site fire extinguishers on incipient stage fires only, and provide emergency first aid as needed. Site personnel will not fight fires containing explosives. The responding fire department personnel will be informed of the nature of the fire and, if explosives are present, the fragmentation distance from which to fight or contain the fire.

The decision on whether or not to try to extinguish a fire using available site personnel and equipment will be made by the UXOSO and based on whether the fire is small, large, or involves explosives.

9.2.3.1 Small Fires

A small fire is defined as a fire that can most likely be extinguished by site personnel using portable extinguishers of 10B:C and 20B:C size. A small fire must also be free and clear of explosive materials, especially MEC. If a small fire occurs, the UXOSO will direct site personnel to perform the following, if safe to do so:

- Evacuate unnecessary personnel to an upwind position
- Attempt to extinguish the fire using portable fire extinguishers or by smothering
- Remove any essential or flammable items from the path of the fire
- Notify emergency response services (fire, police, ambulance, hospital, etc.) as needed.

If a fire extinguisher is used, this must be immediately reported to the UXOSO. The fire extinguisher must be immediately removed from service until it can be recharged. Another fire extinguisher must be made available to the operating area. The area around where the fire occurred must be watched for a minimum of one hour after the fire has been extinguished to ensure re-ignition does not occur. If personnel are not working in the area, the UXOSO should check the area of the fire periodically to ensure re-ignition does not occur.

9.2.3.2 Large Fires

A large fire is defined as a fire which cannot be extinguished or which, due to its size, cannot be extinguished using portable fire extinguishers. In the event that a large fire occurs and the fire does not involve explosive materials, the UXOSO will direct personnel to conduct the following, if safe to do so:

- Evacuate all non-essential personnel from the site to an upwind location
- Notify the Fire Department and other emergency response services (police, ambulance, hospital, etc.) as needed
- Order the appropriate level of protective equipment to be worn by personnel responding to the fire
- Attempt to control the fire to the extent possible
- Remove any essential or flammable items from the path of the fire.

9.2.3.3 Fires Involving Explosive Materials

If a fire occurs that involves explosive materials such as chemicals, fuels or MEC, the UXOSO will order the immediate evacuation of all site personnel to an upwind assembly point of at least fragmentation distance from the fire site. The UXOSO will then notify the Fire Department and any other emergency services (police, ambulance, hospital, etc.) as needed. At no time will USA personnel fight a fire involving explosive materials, nor will they allow outside emergency personnel to do so. The Fire Department personnel may not enter any closer than fragmentation distance from the fire and they may spray water to surrounding buildings or structures in order to prevent the spread of fire.

After the fire has burned itself out, the site must be barricaded and entry prohibited until adequate cooling time has passed (at least 24 hours for a large fire). Explosive materials that may not have discharged during the fire may still be liable to function in the presence of extreme heat. After the site has cooled down, the SUXOS and UXOSO will inspect the site. Any MEC that is observed on the surface will be disposed of in a blow-in-place operation as it will be considered to be too hazardous to move. All MEC must be destroyed in place before non-UXO qualified personnel are permitted to enter the area.

If non-UXO qualified personnel must enter the site for purposes of fire investigation, they must receive a briefing on the potential hazards of MEC on the site. They must be accompanied at all times by a UXO-qualified employee of USA. NO OUTSIDE PERSONNEL WILL BE PERMITTED ONTO THE SITE WHILE THERE IS A KNOWN MEC HAZARD PRESENT. If, during the course of the investigation MEC is observed, the site will be evacuated of all non-UXO qualified personnel until the site can be rendered safe for re-entry.

9.2.3.4 Explosions

In the event of an explosion, the UXOSO will order the evacuation of all site personnel to a safe, upwind assembly point of at least fragmentation distance away. The UXOSO will then notify all necessary emergency response services. After an explosion has occurred the site will remain barricaded for a minimum of 30 minutes before entry is permitted. The UXOSO will enter the site with the SUXOS or a qualified team member and inspect for presence and condition of MEC. If material is deemed to be non-hazardous, it will be removed to a secured collection point for later sale to a qualified recycler. If material is deemed to be hazardous, it will be disposed of in place. Non-UXO qualified personnel may not enter the area until all known MEC has been identified, marked, removed or destroyed. If non-UXO qualified personnel need to enter the site, they must first be briefed on the potential hazards of the site. They must be accompanied at all times by an UXO-qualified employee of USA. If MEC is discovered during the course of their visit, they must immediately leave the site until it can be rendered safe for re-entry.

9.2.4 Posting of Emergency Telephone Numbers

Emergency resources are listed in Table 9-1. These emergency contact numbers must be posted with each telephone, and in each site vehicle.

Table 9-1: Emergency Contact Numbers

Contact	Phone Number
Ambulance	911
Fire Department	911
Police	911
Mid Coast Hospital	207-729-0181
Occupational Health Clinic: US Health Works	202-725-2697
Navy Caretaker, Robert LeClerc	207-263-6736
NAVFAC RPM, Todd Bober	215-897-4911
Poison Control Hotline	1-800-222-1222
USEPA National Response Center	1-800-424-8802
CHEMTREC	1-800-424-9300
Federal OSHA Emergency Hotline	1-800-321-OSHA (6742)
USA Program Manager, Doug Ralston	813-343-6368
USA Project Manager, Robert Hierholzer	813-343-6339
USA Corporate Health and Safety Manager, Cheryl M. Riordan, CSP	757-689-4737
USA Director of Safety and Quality Robert Crownover	813-343-6364

In the event of an on-site emergency, the individual team leader or first person aware of the emergency will contact the UXOSO. The UXOSO will normally be responsible for contacting the first responders to administer first aid services and the ambulance to transport the victim to the hospital, should that be needed. If the order is given to evacuate the site of all personnel, each on-site team leader will assemble, account for, and evacuate all team personnel to the pre-designated staging area in the support zone. The first responders will render emergency first aid treatment and the UXOSO will authorize site personnel to assist, where required. The local Fire Department will be called by the UXOSO. The UXOSO will ensure that the Fire Department, if called to the site, does not approach any closer than fragmentation distance of the munition with the greatest fragmentation distance.

9.2.5 Man Overboard/Abandon Ship Plan

Boat operations will be handled by another contractor. USA personnel involved in waterborne operations will follow the directions of the vessel Captain in the event of a man overboard or abandon ship situation. All USA personnel will be required to wear a Type II personal floatation device at all times while onboard the vessel. The vessel will be equipped with rescue equipment such as a hook or a ring buoy with a rope for rescue use in a man overboard situation, and all personnel will be required to learn how to use this equipment in the event of an emergency.

9.2.6 Medical Support

USA will have two persons assigned to the site who are certified in first aid and cardiopulmonary resuscitation (CPR). These individuals, who will be identified to all site personnel during mobilization training, will be the first responders to a site accident. Other site workers may be asked to assist these workers as necessary. If a worker has a potentially serious injury or illness, the UXOSO will make the decision to notify EMS. An ambulance will be called in to transport the victim to the nearest hospital. For less serious injuries, a co-worker may take a victim for medical treatment to the nearest hospital emergency room. For serious injuries, the medical treatment facility for use at this project site will be Mid Coast Hospital, 123 Medical Center Drive, Brunswick, ME 04011. The hospital is approximately 3 miles

from Former NAS Brunswick. The SHSP provided as Appendix C of this APP contains a map with directions to the hospital.

The occupational health clinic for this site will be US Health Works Medical Group, 11 Medical Center Drive, Brunswick, ME 04011. A map with directions to the occupational health clinic can be found in Appendix C.

The USA Occupational Physician will be available by phone to provide occupational specific information in case medical treatment is needed. Dr. James Vawter of Tierney-Vawter Medical Group can be reached at telephone number (831) 647-8700.

The UXOSO will maintain a first aid kit and bloodborne pathogens kit in his transport vehicle on the site. Personnel with first aid type injuries will also report to the UXOSO, who will instruct the first responders to provide first aid treatment of their injuries. The UXOSO will be advised of any first aid treatment provided, so that he may investigate the root cause of the injury and take preventive action on-site. All treatment will be recorded and any necessary forms completed for documentation of the injury or illness.

9.2.6.1 Bloodborne Pathogens Program

The strategy of "Universal Precautions" was developed by the Centers for Disease Control to address concerns regarding transmission of Human Immunodeficiency Virus (HIV). This concept stresses that all sources should be assumed to be infectious for HIV, hepatitis B virus, and other bloodborne pathogens. The philosophy of universal precautions will be applied whenever USA employees render first aid involving potential contact with blood, body fluids, or other potentially infectious materials. All blood and body fluids will be treated as if they are infectious. PPE and clean-up procedures will be implemented accordingly.

9.2.6.2 Engineering Controls

Engineering controls will be used whenever possible to eliminate or reduce the potential for employee exposure, and will be periodically examined, maintained or replaced to ensure their effectiveness. USA employees will observe "universal precautions," and treat all body fluids as potentially infectious materials. USA will provide hand-washing facilities, readily accessible to employees. Where the installation of hand-washing facilities is not feasible, appropriate antiseptic cleanser and clean paper will be provided. USA employees will wash their hands and any other potentially exposed skin with soap and running water as soon as possible:

- After removing gloves or other PPE
- After contact with potentially infectious materials
- Even after washing with antiseptic as described
- USA employees will flush eyes or other mucous membranes with copious amounts of water as soon as possible after contact of these areas with potentially infectious materials.

For emergency first aid situations involving multiple victims, equipment will not be used on different victims unless it has been properly decontaminated or if the victim's medical condition would be seriously affected by a delay in treatment.

9.2.6.3 Safe Work Practices

Safe work practices will be implemented whenever possible to eliminate or reduce the potential for employee exposure.

- Employees will wash their hands immediately, or as soon as feasible, after removal of gloves or other PPE.
- Employees will wash hands and any other skin with soap and water, or flush mucous membranes with water immediately following contact with blood or potentially infectious materials.

- If potentially contaminated sharps are encountered, the item will immediately be disposed of in an appropriate container for decontamination and disposal.
- Eating, drinking, smoking, applying cosmetics or lip balm, handling of contact lenses, any hand-to-face activities, or storage/handling of food is prohibited in all areas where potentially infectious materials are present.
- Equipment that has become contaminated will be decontaminated prior to servicing or storage, unless decontamination is not feasible, in which case the equipment will be disposed of properly in appropriately labeled and color-coded containers.

9.2.6.4 Personal Protective Equipment (PPE)

When occupational exposures remain after the implementation of engineering and work practice controls, appropriate PPE will be utilized to control employee exposures. USA will provide appropriate PPE including gloves, face masks, eye protection, mouthpieces, etc., for protection against potentially infectious materials. Personal protective equipment will not allow potentially infectious materials to pass through or reach an employee's clothes, skin, eyes, mouth, or other mucous membranes during normal use for the expected duration of time for which the PPE will be used.

Employees will use the appropriate PPE unless, in unusual circumstances, the employee believes that using the protective equipment will prevent the administering of first aid or would pose an increased risk. Any incident where the use of protective equipment is declined will be investigated and documented by the UXOSO and be approved by the CHSM.

Single-use protective equipment, such as surgical gloves, will be disposed of after each use, or as soon as possible after the equipment has become damaged. Multi-use protective equipment, such as coveralls or utility gloves, will be cleaned and decontaminated after each use or when they become contaminated in order to maintain their effectiveness. Multi-use protective equipment will be removed, and then disposed of or repaired as soon as possible after becoming damaged.

When PPE is removed, it will be placed in an appropriately designated area or container for storage, washing, decontamination or disposal. PPE will be removed and disposed of or decontaminated before it leaves the area.

Gloves will be worn when it can be reasonably anticipated that the employee may have hand contact with potentially infectious materials. Disposable (single use) gloves will not be washed for reuse and will be disposed of after each use or if their ability to function as a barrier is compromised. Utility gloves may be decontaminated for re-use if the integrity of the glove is not compromised. However, they must be discarded if they exhibit signs of deterioration or when their ability to function as a barrier is compromised.

Masks, in combination with eye protection devices, such as safety glasses, goggles or face shields, will be worn whenever blood or other potentially infectious materials may be generated, and eye, nose, or mouth contamination can be reasonably anticipated.

9.2.6.5 Decontamination Procedures

All equipment, working surfaces and non-working surfaces will be decontaminated after contact with potentially infectious materials. A solution of ten parts water to one part bleach or, other equally effective material, will be used to clean contaminated areas in accordance with the following requirements:

- Contaminated sharp objects will be cleaned using mechanical means such as a brush and dustpan.
- Sharp objects will not be picked up directly with the hands.
- Two pairs of gloves, inner surgical gloves and outer utility gloves, will be worn for cleaning contaminated surfaces.
- A smock or apron and eye protection will also be worn.
- Only those employees directly involved with the decontamination efforts will be allowed in the work area while cleaning is taking place.

- All cleaning equipment will be disinfected or disposed of in accordance with this program.
- For minor injuries where the employee is able to return to work, the injured employee will clean up his/her own blood or other potentially infectious materials.

9.2.6.6 Housekeeping and Waste Disposal

The work site will be maintained in a clean and sanitary condition to prevent the spread of contamination to other areas of the facility. All equipment and working surfaces will be cleaned and decontaminated after contact with blood or other potentially infectious materials. Contaminated work surfaces and equipment will be decontaminated with an appropriate disinfectant immediately after they become contaminated, in accordance with the decontamination section of this program. Regulated waste, other than contaminated sharps, will be placed in containers that are: closable, constructed to contain all contents and prevent leakage, properly labeled or color-coded, and closed prior to removal or replacement. Labels or color-coding will be fluorescent orange or orange-red, and display the biohazard symbol in a contrasting color. Regulated waste containing contaminated sharps will be placed in containers which are: closable, puncture resistant and leak proof on sides and bottom, properly labeled or color-coded, and closed prior to removal or replacement. Contaminated clothing, equipment and other materials will be handled as little as possible and with minimum agitation. Bags containing contaminated materials will not be carried or handled from the bottom. All regulated waste will be disposed of in accordance with applicable federal, state, and local regulations.

9.3 PLAN FOR PREVENTION OF ALCOHOL AND DRUG ABUSE

The USA program is included as Appendix D. All project personnel will be asked to read and abide by this plan. The policy will be posted at the job site.

9.4 SITE SANITATION PLAN

An adequate supply of potable (drinkable) water will be provided on-site at all times. Adequate sanitation facilities will be provided at each work site to ensure proper personal hygiene. Site sanitation will be established and maintained in accordance with OSHA 29 CFR 1910.120(n) as follows:

- Containers used for potable water will be capable of being tightly closed, equipped with a tap and maintained in a clean and sanitary condition.
- A container used for distribution of drinking water will be clearly labeled as to its contents and not used for any other purpose.
- Water will not be dipped from the container and use of a common cup will not be allowed.
- Where single service cups are provided, separate sanitary containers will be provided for the storage of the unused cups and for the disposal of the used cups.
- Water coolers of drinking water will be placed in the support zone.
- Personnel will be instructed to wash their faces and hands prior to drinking.
- Outlets and storage containers for non-potable water, such as water for firefighting or decontamination, will be clearly labeled to indicate that the water is not suitable for drinking as follows: “CAUTION – WATER UNSAFE FOR DRINKING, WASHING, OR COOKING.” At no time will there be a cross connection or open potential between a system furnishing potable water and a system furnishing non-potable water.
- Chemical toilets will be available at the work site. The toilet will be equipped with toilet paper, toilet paper holder, light, washing facilities, locking door, and adequate ventilation.
- Hand and face washing facilities will be set up in the support zone of the work area. These will be utilized by all personnel exiting the EZ prior to eating, drinking, tobacco use or other hand to face activities. Washing facilities will consist of potable running water, soap, and drying towels. Portable eyewash will be available in site vehicles and with the first aid kits.

- Waste Disposal: A trash receptacle will be present in the support zone for the disposal of hand drying materials, any disposable PPE, paper towels used to dry hands and other generated site debris.

9.5 ACCESS AND HAUL ROAD PLAN

NA

9.6 RESPIRATORY PROTECTION PLAN

NA

9.7 HEALTH HAZARD CONTROL PROGRAM

USA will be conducting a Remedial Investigation of Site 12 EOD area at the Former NAS Brunswick site. During USA's previous site visit, construction debris was observed. Due to the presence of construction debris, there is the potential to encounter ACM.

9.7.1 Risk Evaluation

ACM is commonly encountered in construction materials dating from the 1970's and earlier. It was commonly used in insulation, roofing materials, and tiles. Asbestos presents an inhalation hazard, at low levels of exposure, with a Permissible Exposure Limit (PEL) of 0.1 fiber/cm^3 as an 8 hour time weighted average (TWA). Exposure symptoms normally do not present for many years, as mesothelioma and other lung cancers may take 15 or more years to develop. As it is an inhalation hazard, asbestos is most hazardous when it is friable, which occurs when the material is dry and breaks or emits fibers into the air.

9.7.2 Basis of Evaluation

- ACM was used in construction material for many years from 1970's and earlier.
- Construction material has been observed on this site, which could potentially contain ACM.
- Dry ACM could present a friable asbestos hazard.
- Broken ACM could present a friable asbestos hazard.

Initial Risk Without Controls (Check One) ☐ High ☐ Medium ☒ Low ☐ Minimal

Note: High or medium risks require risk analysis.

Residual Risk With Controls (Check One) ☐ High ☐ Medium ☐ Low ☒ Minimal

9.7.3 Health Hazard Control

This portion of the Health Hazard Control Plan defines the manner in which each hazard will be controlled to an acceptable level, thus certifying the adequacy of the controls. The hierarchy of controls (engineering, administrative, and PPE as a last resort) has been utilized in identifying and employing control systems.

Table 9-2: MEC/UXO

Task	Hazard Scenario	Hazard Control
ACM location	Improper handling or disturbing ACM during investigation of project area.	• Training and supervision of personnel. • Procedures established to proceed with caution if construction debris is encountered. • Material will be thoroughly wet down prior to

		examining it further. • If potential ACM is encountered, evacuate site and call Parsons to perform sampling, while in Level C PPE. • USA PM will notify the NAVFAC RPM of the situation and will await further instructions.

9.7.4 Training Requirements

All personnel working on this site (including subcontractor personnel) will receive Asbestos Awareness Training as part of site mobilization training. Personnel will already have HAZWOPER 40 hour training, and current HAZWOPER 8 hour refresher training prior to mobilization to site. Supervisory personnel will also have HAZWOPER Supervisor Training prior to mobilization to the site.

9.7.5 Procedures

Procedures have been established in the Work Plan, and all site personnel will be trained in the procedures to follow should potential ACM be encountered on the site. If construction debris is encountered, it will be thoroughly wet down prior to examining it. If potential ACM is present, USA personnel will evacuate the site and Parsons personnel will don Level C PPE and take samples of the material, which will then be sent to a laboratory for evaluation. Should the samples be positive, the PM will notify the NAVFAC RPM and await further instructions. Any actions that will require movement of the ACM will be performed in Level C PPE. An AHA has been prepared for potential ACM operations and all personnel will be trained in these procedures.

9.8 HAZARD COMMUNICATION PROGRAM

The program establishes procedures for USA employees who handle and store chemical products at USA sites. It ensures that hazards of all chemicals purchased are evaluated and the information concerning their hazards is transmitted to employees. The delivery of information will be accomplished by employee training, container labeling, and other forms of warning and MSDS. All MSDS will be requested from the suppliers at the time of order. If not available then a recent MSDS will be downloaded from the Internet.

- A current inventory will be maintained of all hazardous materials brought to the site. This inventory will be inspected at least weekly to ensure it remains current.
- All chemical products used on the site will be properly labeled, to include products that have been taken from a large container and placed in a smaller container for use.
- As part of the written USA Hazard Communication Program, an MSDS binder will be maintained on-site, which includes copies of MSDSs for all hazardous materials brought onto the site by USA. It will be kept in the UXOSO site vehicle during operations, and all USA personnel will be made aware of that fact. This MSDS binder will be available on request to all site personnel during all working hours of the site. If site workers have further questions about any of the hazardous materials they come into contact with, the USA CHSM will locate the required information and pass it on to the employee.
- All USA employees who will be performing work involving the handling of hazardous materials will receive Hazard Communication training detailing the hazards of the product, appropriate protective measures to prevent exposure to the product, as well as safe procedures for storage and handling of the product, and response to emergencies. Personnel may request an MSDS for any hazardous material on the site at any time. This training will occur as part of the initial mobilization training at the site and will be documented on the USA Documentation of Training Form.

The UXOSO must ensure that project personnel can immediately obtain the required information about chemicals of concern during an emergency.

9.9 PROCESS SAFETY MANAGEMENT PLAN

NA

9.10 LEAD ABATEMENT PLAN

NA

9.11 ASBESTOS ABATEMENT PLAN

While there is a potential to encounter ACM during the course of operations, asbestos abatement is not within the scope of work for this project.

9.12 RADIATION SAFETY PROGRAM

NA

9.13 ABRASIVE BLASTING

NA

9.14 HEAT STRESS/COLD STRESS MONITORING PLAN

9.14.1 Heat Stress

Heat stress is one of the most common (and potentially serious) illnesses that affect hazardous waste site workers. When site personnel are engaged in operations involving hot environments and/or the use of semi- or impermeable clothing, a number of physiological responses can occur that may seriously affect the health and safety of the workers. These effects can be eliminated or controlled through the use of a comprehensive heat stress prevention and monitoring program. Therefore, it is the objective of this program to outline the methods and procedures to be followed by USA personnel for the prevention, control and/or treatment of heat-related illnesses.

Causes of Heat Stress – The most common cause of heat stress during site activities is the effect that PPE has on the body's natural cooling mechanism. Impermeable PPE interferes with the evaporation of perspiration and causes the body to retain metabolic and environmentally induced heat. Individuals will vary in their susceptibility and degree of response to the stress induced by increased body heat. Heat stress can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors including environmental condition, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites, regular monitoring and other preventive precautions are vital.

Factors that may predispose a worker to heat stress include:

- Lack of physical fitness
- Lack of acclimatization to hot environments
- Degree of hydration
- Level of obesity
- Current health status (e.g., having an infection, chronic disease, diarrhea, etc.)
- Alcohol or drug use
- The worker's age and sex
- Sunburn.

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

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

Prior to initiating site activities each day, and periodically throughout the day, the UXOSO will inspect the site personnel for evidence of the previously mentioned factors to determine those personnel who are at increased risk for heat stress-related disorders. Evidence of extreme dehydration, illness or drug or alcohol use may require the UXOSO to restrict the worker's activities until such time as the worker is fit for duty. Personnel identified as being at high risk for heat stress who are allowed to participate in site operations will be monitored frequently by the UXOSO throughout the day.

Heat Stress Disorders – This section outlines the major heat-related illnesses that may result from exposure to high heat environments and/or the use of semi-permeable or impermeable clothing. For the purpose of this Program, reference to "liquids" will indicate the use of water or an electrolyte replacement solution, and not tea or coffee (unless it is decaffeinated) or carbonated soft drinks.

- Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by wet, chafing clothes. This condition can decrease a worker's ability to tolerate hot environments.

Symptoms: Mild red rash, especially in areas of the body that sweat heavily.

Treatment: Decrease amount of time in protective gear and provide powder such as corn starch or baby powder to help absorb moisture and decrease chafing. Maintain good personal hygiene standards and change into dry clothes if needed.

- Heat Cramps

Heat cramps are caused by a profuse rate of perspiration that is not balanced by adequate fluid and electrolyte intake. The occurrence of heat-related cramps is often an indication that excessive water and electrolyte loss has occurred, which can further develop into heat exhaustion or heat stroke.

Symptoms: Acute, painful spasms of voluntary muscles such as the back, abdomen and extremities.

Treatment: Remove victim to a cool area and loosen restrictive clothing. Stretch and massage affected muscles to increase blood flow to the area. Have patient drink 1 to 2 cups of liquids immediately, and every 20 minutes thereafter. Consult with a physician if condition does not improve. If available, an electrolyte replacement solution should be taken along with water.

- Heat Exhaustion

Heat exhaustion is a state of very definite weakness or exhaustion caused by increased stress on various organs to meet increased demands to cool the body due to excessive loss of fluids from the body. This condition leads to inadequate blood supply and cardiac insufficiency. Heat exhaustion is less dangerous than heat stroke, but nonetheless must be treated. If allowed to go untreated, heat exhaustion can quickly develop into heat stroke.

Symptoms: Pale or flushed, clammy, moist skin, profuse perspiration, and extreme weakness. Body temperature is basically normal or slightly elevated, the pulse is weak and rapid, and breathing is shallow. The individual may have a headache or be dizzy or nauseated.

Treatment: Use passive and active cooling. Orally administer cool water and/or electrolyte replacement liquids immediately, to hydrate the victim, starting with small sips and continuing with larger amounts as the victim is able to hold it down. Total liquid consumption should be about 1 to 2 gallons per day. Transfer the victim to a medical facility if symptoms do not subside, or become more severe.

- Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by a failure of the heat regulating mechanisms of the body. The failure of the individual's temperature control system causes the perspiration system to stop working correctly. When this occurs, the body core temperature rises very rapidly to a point [105 + degrees Fahrenheit (°F)] where brain damage and death will result if the person is not cooled quickly.

Symptoms: The victim's skin is hot and may or may not be red and dry (due to the fact that the individual may still be wet from having sweat while wearing protective clothing earlier); nausea; dizziness; confusion; extremely high body temperatures; rapid respiratory and pulse rate; delirium; convulsions; unconsciousness or coma.

Treatment: Cool the victim immediately. If the body temperature is not brought down quickly, permanent brain damage or death may result. The victim should be moved to a shady area; lay them down and keep the head elevated. Passive and active cooling should be used. If conscious, orally administer cool water and/or electrolyte replacement liquids immediately to hydrate the victim, starting with small sips and increasing amounts as the victim is able to hold it down. Rapidly transfer the victim to an emergency medical facility for immersion in cool water. Do not give the victim caffeinated or alcoholic beverages. Heat stroke is considered a medical emergency.

- Preventive Measures
  - Required Preventive Measures

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat exhaustion, that person may become predisposed to additional heat injuries. In order to avoid heat-related illnesses, proper preventive measures will be implemented whenever environmental conditions dictate the need. These preventive measures represent the minimal steps to be taken and will include the following procedures.

The UXOSO will examine each site worker prior to start of daily operations to determine the individuals susceptible to heat induced stress. Workers exhibiting factors that make them susceptible to heat stress will be closely monitored by the UXOSO.

Site workers will be trained to recognize and treat heat-related illnesses. This training will include the signs, symptoms and treatment of heat stress disorders as outlined in this Program.

In order to maintain workers' body fluids at normal levels, workers will be encouraged to drink, as a minimum, approximately 16 ounces of liquids prior to start of work in the morning, after lunch and prior to leaving the site at the conclusion of the day's activities. Disposable 4- to 12-ounce cups and liquids or bottles of water will be provided on-site. Acceptable liquids will include water and an electrolyte replacement solution. It is recommended that the water to balanced electrolyte liquids be taken at a 2:1 ratio with the intake of water being twice the intake of the balanced electrolyte liquids. Liquids containing caffeine are to be avoided.

When ambient conditions and site workload requirements dictate, as determined by the UXOSO, workers will be required to drink a minimum of 16 to 32 ounces of liquids during each rest cycle. The normal thirst mechanism is not sensitive enough to ensure that enough water will be ingested to replace lost sweat. When heavy sweating occurs, workers should be encouraged to drink even though they may not be thirsty. The following strategies may be useful in encouraging fluid intake:

- Maintain water temperature at 50 °F to 60 °F (10 °C to 15.6 °C).
- Provide small disposable cups that hold about 4 ounces (0.1 liter).

- Have workers drink 16 ounces (0.5 liter) of fluids (preferably water or dilute drinks) before beginning work.
- Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.
- A shelter or shaded area will be provided where workers may be protected from direct sunlight during rest periods.

Monitoring of ambient or physiological heat stress indices will be conducted to allow prevention and/or early detection of heat-induced stress. Monitoring will be conducted in accordance with applicable paragraphs of this Program.

Site workers will be given time to acclimatize to site work conditions, temperature, protective clothing, and workload. Acclimatization usually takes about a week to 10 days of continued work in hot environments, and allows the worker's body to become adjusted to this level and type of work. This process involves a gradual increase in the workload over the required period, the length of which depends upon the nature of the work performed, the ambient temperatures, the level of PPE required for the job, and the individual's susceptibility to heat stress.

Work schedules will be adjusted as follows:

- Modify work/rest schedules according to monitoring requirements
- Mandate work slowdowns as needed
- Rotate personnel: alternate job functions to minimize overstress or overexertion at one task
- Add additional personnel to work teams
- Perform work during cooler hours of the day if possible.

- Supplemental Preventive Measures

When possible and/or feasible, the following measures will also be implemented to aid in prevention or reduction of the effects of heat induced stress:

Designated rest areas will be air-conditioned and the temperature maintained between 72 °F and 76 °F.

Cooling devices will be provided to aid in body heat exchange. Cooling devices may include cooling jackets, vests or suits and field showers or hose-down areas. Depending on the severity of the heat exposure some form of artificial cooling may be required to ensure protection of the workers.

Workers will be encouraged to achieve and maintain an optimum level of physical fitness. Increased physical fitness will allow workers to better tolerate and respond to hot environments and heavy workloads. In comparison to an unfit person, a fit person will have less physiological strain, a lower heart rate and body temperature, and a more efficient sweating mechanism.

- Heat Stress Monitoring

Because the incidence of heat stress depends on a variety of factors, all workers, even those not wearing protective equipment, should be monitored. USA uses portable heat stress monitoring instrumentation to determine level of work load and rest periods. Physiological monitoring methods are used as an alternate means of monitoring. The frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and the level of physical work (see Table 9-3). The length of the work cycle will be governed by the frequency of the required physiological monitoring.

For workers wearing permeable clothing (e.g., standard cotton or synthetic work clothes), follow recommendations for monitoring requirements and suggested work/rest schedules in the current ACGIH TLVs for Heat Stress. If the actual clothing worn differs from the ACGIH standard ensemble in insulation value and/or wind and vapor permeability, change the monitoring requirements and work/rest schedules accordingly.

When site personnel are engaged in site activities involving the use of semi-permeable or impermeable clothing in ambient temperatures greater than 70 °F, heat stress monitoring will be conducted. When site personnel are in typical Level D PPE, heat stress monitoring will begin when the temperature reaches 75 °F or above. The goal of all heat stress monitoring is to ensure that the worker's body temperature does not exceed 100.4 °F. The physiological monitoring method listed below is to be implemented based upon the severity of the heat and workload. The UXOSO will monitor the worker's heart rate as an indication of potential heat stress and acclimatization. The frequency of physiological monitoring will be determined using the information presented in Table 9-3.

For monitoring the body's recuperative ability toward excess heat, both of the following techniques should be used as a screening mechanism. Monitoring of personnel wearing impervious clothing should commence when the ambient temperature is 70 °F or above. Frequency of monitoring should increase as the ambient temperature increases or as slow recovery rates to baseline (pre-work) levels are indicated.

Table 9-3: Suggested Frequency of Physiological Monitoring[a]

Adjusted Temperature[b]	Normal Work Ensemble[c]	Impermeable Ensemble
90 °F (32.2 °C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5 - 90 °F (30.8 - 32.2 °C)	After each 60 minutes of work	After each 30 minutes of work
82.5 - 87.5 °F (28.1 - 30.8 °C)	After each 90 minutes of work	After each 60 minutes of work
77.5 - 82.5 °F (25.3 - 28.1 °C)	After each 120 minutes of work	After each 90 minutes of work
72.5 - 77.5 °F (22.5 - 25.3 °C)	After each 150 minutes of work	After each 120 minutes of work

[a] For work levels of 250 kilocalories/hour.

[b] Calculate the adjusted air temperature (at adj) by using this equation: at adj °F = ta °F + (13 x % sunshine). Measure air temperature with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

[c] A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

- Wet Bulb, Dry Globe Temperature Monitoring

For site conditions where personnel are working in Level D PPE, and the ambient temperature is greater than 75 °F, the UXOSO will conduct wet bulb, dry globe temperature (WBGT) monitoring to assist in controlling the potential for site workers to experience heat related adverse health effects. The UXOSO will use a real-time direct reading WBGT monitor, and after estimating the work load, use the values expressed in Table 9-3, to determine the work/rest schedule to be implemented. The values outlined in this table are designed such that nearly all acclimatized, fully clothed workers with adequate salt and water intake will be able to function without the body temperature exceeding 100.4 °F.

Acclimatization is the adaptive process that results in a decrease of the physiological response produced by the application of a constant environmental stress. On initial exposure to a hot environment, there is an impaired ability to work and evidence of physiological strain. If the exposure is repeated on several successive days, there is a gradual return of the ability to work and a decrease in physiological strain. Within 4 to 7 days following initiation of the acclimatization process, a dramatic improvement in the ability

to perform work is noticed: subjective discomfort practically disappears; body temperature and heart rate are lower; there is a more stable blood pressure; and sweat is more profuse and dilute.

Alcohol should not be consumed in a hot environment because the loss of body fluids increases the risk of heat stress.

- Heart Rate Monitoring

The worker's baseline heart rate should be recorded prior to initiation of site activities by measuring the radial pulse rate for thirty seconds. After each work cycle, the heart rate should be measured by taking the pulse rate (PR) for 30 seconds as early as possible into the resting period. Taking the radial (wrist) pulse rate is the preferred method; however, the carotid (neck) pulse rate may be taken if a worker has difficulty finding the radial pulse. The PR at the beginning of the rest period should not exceed one hundred and ten (110) beats per minute (bpm). If the PR is higher than 110 bpm, the next work period should be shortened by thirty-three percent, while the length of the rest period stays the same. If the PR exceeds 110 bpm at the beginning of the next rest period, the work cycle should be further shortened by thirty-three percent. This procedure will be continued until the worker's PR at the beginning of the rest cycle is maintained below 110 bpm.

Table 9-4: Permissible WBGT Heat Exposure Threshold Limit Values

Work – Rest Regimen	WORK LOAD		
	Light*	Moderate*	Heavy*
Continuous work	86 (30.0)	80 (26.7)	77 (25.0)
75% Work - 25% Rest, each hour	87 (30.6)	82 (28.0)	78 (25.9)
50% Work - 50% Rest, each hour	89 (31.4)	85 (29.4)	82 (27.9)
25% Work - 75% Rest, each hour	90 (32.2)	88 (31.1)	86 (30.0)

* Consult the ACGIH TLV booklet for definitions of Light, Moderate and Heavy workloads.

- Heat Stress Documentation

The UXOSO will be responsible for recording all heat stress related information. This will include training sessions and monitoring data. Training sessions will be documented using the Documentation of Training form. Pulse rate monitoring data will be recorded on the Heat Stress Monitoring Log (Table 9-5), with the WBGT.

Values are given in $^{\circ}$F and $^{\circ}$C WBGT, and are intended for workers wearing single layer summer type clothing. Use of semi-permeable or totally impermeable clothing requires monitoring in accordance with the USA Heat Stress Prevention Program. As workload increases, the heat stress impact on an unacclimatized worker is exacerbated. For unacclimatized workers performing a moderate level of work, the permissible heat exposure TLV should be reduced by approximately 2.5 $^{\circ}$C.

Table 9-5: Heat Stress Field Monitoring and Alert Checklist

USA Environmental, Inc.

HEAT STRESS ALERT – Field Monitoring and Alert Checklist

DATE: **SURVEYOR(S):**

I. AREA INFORMATION		
LOCATION:		
SOURCE:		
ENGINEERING CONTROLS:		
II. SURVEY INSTRUMENT INFORMATION		
INSTRUMENT:	MODEL:	SERIAL #:
FACTORY CALIBRATION DATE:	PRE-CAL: ☐ BY:	POST-CAL: ☐ BY:
III. SAMPLING INFORMATION AND RESULTS		
HAZARD: Heat Stress	UNITS: ☐ °F ☐ (°C) ☐ WBGT	CORRECTIONAL FACTOR:
See attached printout or record below.		

TIME	WBGT-OUT (°F)	WB	DB	GL	COMMENTS

037 USA Form
Original: March 2011

9.14.2 Cold Stress

As work will be taking place in November, there is a potential for a snowstorm or freezing conditions, and the work will be in wet soils, the pond, and wetland areas; thus, there is a high potential to experience cold stress. The effects experienced by site personnel when working in cold environments depend upon many environmental and personal factors, such as ambient air temperature, wind speed, duration of exposure, type of protective clothing and equipment worn, type of work conducted, level of physical effort, and the health status of the worker. In cold environments, overexposure can cause significant stress on the body, which can lead to very serious and permanent injury. Cold may affect just the exposed body surfaces and extremities, or may affect the deeper body tissues and the body core. Hypothermia, immersion, and frostbite result from extremes in cold exposure. Hypothermia conditions can affect judgment and reasoning ability. Protective clothing such as gloves and Saranex clothing should minimize cold conditions by reducing evaporation. Similarly, movement and activity will reduce cold stress by increasing metabolism.

Cold temperature extremes can be made more dangerous by water and wind speed. At temperatures below 32 °F, the effects of wind speed become pronounced. The use of a tarp or other barrier should be considered as a contingency to reduce the effects of wind speed. As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 miles per hour (mph) increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is soaked with perspiration. In cold extremes, if feet become soaked they should be dried at the earliest possible time. In cold extremes after decontamination procedures, site employees will proceed to a protected area.

- Cold Stress Disorders
  - Immersion Foot or Trench Foot

These two cold injuries occur as a result of exposure to cool or cold weather and persistent dampness or immersion in water. Immersion foot usually results from prolonged exposure when air temperatures are above freezing, whereas trench foot normally occurs from shorter exposure at temperatures near freezing. The symptoms for each disorder are similar and include tingling, itching, swelling, pain in some cases or numbness in others, lack of sweating, and blisters.

  - Hypothermia

Hypothermia results when the body loses heat faster than it can produce it. When this occurs, the blood vessels in the skin and extremities constrict, reducing the flow of warm blood to those areas, thereby reducing the rate of heat loss. This reduction in blood flow usually affects the peripheral extremities first. Ears, fingers and toes begin to experience chilling, pain and then numbness due to loss of both blood flow and heat. Shivering begins as the body's core temperature begins to drop, and the body uses the shivering to compensate and create metabolic heat. Shivering is often the first sign of hypothermia. The pain and numbness in the extremities is an indication that the heat loss is increasing, and when shivering becomes uncontrollable, the heat loss in the body core has become extreme. Energy reserves are exhausted. Once the cold reaches the brain, the person will be deprived of judgment and reasoning power. They will not realize this is happening and will also lose control of their hands. The internal temperature will continue to decrease, and without treatment, this will lead to stupor, collapse, and death. The victim should be brought to a warm location, and if conscious should be made to drink warm fluids.

  - Frostbite

Frostbite occurs when there is actual freezing of the water contained in the body tissues. This usually occurs when temperatures are below freezing, but excessive wind can result in frostbite even at ambient temperatures that are above freezing. Frostbite can occur from several types of cold exposure, such as: exposure of bare skin to cold and wind; exposure to extremely cold ambient temperatures; or from skin contact with objects whose temperatures are below freezing. The extremities are usually affected first since they experience reduced blood flow and heat loss. The tissue damage caused by frostbite can be superficial, near the surface of the skin, or extend to deeper body tissues, which can cause severe tissue damage. The skin may first have a prickly or tingling sensation and later become numb with cold, and the appearance may range from superficial redness of the skin to white, hard, frozen-looking tissues.

Frost nip or incipient frostbite is the condition characterized by sudden blanching or whitening of the skin. Superficial frostbite is when the skin has a waxy or white appearance and is firm to the touch, but the tissue beneath is resilient. Deep frostbite is when the tissues are cold, pale, and solid. Deep frostbite is an extremely serious injury. Where deep frostbite exists, it is essential to get the patient to the hospital as quickly as possible.

- Treatment of Cold Stress Disorders

The intent of all cold stress treatment is to bring the deep body core temperature back to its normal temperature of about 98.6 °F. Work performed in cold environments should be discontinued for any worker who exhibits the signs or symptoms associated with hypothermia or frostbite. Workers exhibiting those symptoms should be brought to a warm area and allowed to rest and warm-up. If a worker's clothing becomes wet, which reduces its insulation effect, it should be removed and replaced by dry clothing or allowed to dry before resuming work. A warm, non-alcohol, decaffeinated drink (not coffee) or soup may be given. Re-warming should be gradual.

For frostbite, the victim should be sheltered from the wind and cold and given warm drinks. If the frostbite is superficial, the frozen part should be covered with extra clothing or blankets or warmed against the body. **Do not use direct heat, and do not pour hot water over or rub the affected area.** Warming should be gentle and gradual. Failure to do this could lead to bleeding in the tissues and increase the possibility of infection. If the frostbite is deep, i.e., the affected area is frozen and hard to the touch, immediate medical attention should be obtained. The safe thawing of deep frostbite is beyond the expertise and facilities found on-site.

- Prevention of Cold Stress Disorders

During work in cold environments, the UXOSO will use the tailgate safety briefing to inform site personnel of the measures to be utilized in the prevention and control of cold stress. The UXOSO will also use meteorological data and Table 9-6 to inform site personnel of the combined temperature/wind chill effect to be expected during the day's activities. Prevention methods that site personnel will utilize include:

- Wearing adequate, appropriately layered clothing, including a water repellant outer layer if precipitation is forecasted.
- Layered clothing, including an innermost layer, such as cotton or silk to trap heat and absorb perspiration, an insulating layer (when working with static sensitive materials 100% cotton is recommended), a layer of work weight clothing, and an outer protective layer designed to be wind/water proof. (When working with static sensitive materials, 100% cotton is recommended.)
- Wearing a hat, gloves and socks that are synthetic or wool insulated, to help retain body heat. (When working with static sensitive materials, 100% cotton is recommended.)
- Removing outer layers of clothing during breaks in heated shelters, to prevent excessive sweating.
- In windy, cold conditions, covering all exposed skin.
- Eating well-balanced meals and maintaining adequate intake of non-alcoholic, decaffeinated fluids.
- Seeking shelter in a warm protected area when signs and symptoms of cold stress become evident.
- Protecting clothing from getting wet; this includes keeping clothing from getting wet with sweat, so remove outer layers if work activities cause excessive sweating.

USA will assist in the prevention of cold stress by providing sheltered, warm areas where site personnel can rest and regain body heat during breaks. USA will also provide the following to assist site personnel in abating cold stress:

- Warm fluids, such as soup or decaffeinated tea and cocoa, will be provided as needed
- A minimum of one 15-minute break in a heated shelter every 2 hours

- If approved, a heated shelter may be provided inside the EZ, upwind from the work area, where site personnel can rest and warm up [after having processed through a limited personnel decontamination station (PDS) consisting of glove wash and removal, respirator wash and removal, and hand washing where chemical contamination is anticipated].

NOTE - To date, there are no federally mandated regulations related to work/rest schedules. The 15 minute break every 2 hours is a recommended routine but may not be adequate for all cold environments. The American Conference of Governmental Industrial Hygienists (ACGIH) has published a work/rest schedule, which is provided in Table 9-7. However, this table only applies to, and should be implemented for, temperatures below 0 °F. Therefore, for temperatures above 0 °F, workers will be encouraged to seek shelter and rest in a warm area whenever they exhibit signs or symptoms of cold stress, as discussed previously.

This space is intentionally left blank.

Table 9-6: Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
Wind speeds greater than 40 mph have little additional effect	LITTLE DANGER In < hr with dry skin. Maximum danger of false sense of security				INCREASING DANGER Danger from freezing of exposed flesh within one minute				GREAT DANGER Flesh may freeze within 30 seconds			
	Trench foot and immersion foot may occur at any point on this chart.											

Table 9-7: TLV Work/Rest Schedule for 4-Hour Work Shift*

Air Temp.	No Wind		5 MPH Wind		10 MPH Wind		15 MPH Wind		20 MPH Wind	
°F Approx.	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks	Max. Work Period	No. of Breaks
-4° to -8°	Normal	1	Normal	1	Normal	1	Normal	1	Normal	1
-9° to -13°	Normal	1	Normal	1	Normal	1	Normal	1	75 min.	2
-14° to -18°	Normal	1	Normal	1	Normal	1	75 min.	2	55 min.	3
-15° to -19°	Normal	1	Normal	1	75 min.	2	55 min.	3	40 min.	4
-20° to -24°	Normal	1	75 min.	2	55 min.	3	40 min.	4	30 min.	5
-25° to -29°	75 min.	2	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease	
-30° to -34°	55 min.	3	40 min.	4	30 min.	5	Non-emergency work should cease			
-35° to -39°	40 min.	4	30 min.	5	Non-emergency work should cease					
-40° to -44°	30 min.	5	Non-emergency work should cease							
-45° & Below	Non-emergency work should cease									

1. Schedule applies to any 4-hour work period with moderate to heavy work activity, with warm-up cycle in a warm location and with an extended break in a warm location (e.g., lunch) at the end of the 4 hours. For light-to-moderate work: apply the schedule one step lower.
2. The following is suggested as a guide for estimating wind velocity if other, more accurate, means are not available:
   5 mph - light flag moves; 10 mph - light flag fully extended; 15 mph - raises newspaper sheet; 20 mph - blowing and drifting snow.
3. This table applies only to acclimatized workers with appropriate dry clothing for winter work.

* Adapted from the "Threshold Limit Values and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

9.15 CRYSTALLINE SILICA MONITORING PLAN

NA

9.16 NIGHT OPERATIONS LIGHTING PLAN

NA

9.17 FIRE PREVENTION PLAN

In order to prevent fire from occurring, every step will be taken to keep the site neat and clean. All equipment and materials not in use will be put away in designated locations. Trash receptacles or bags will be available at the site; these will be emptied on a daily basis to keep trash from accumulating. All flammable liquids will be stored in approved flammable liquid cans in order to prevent spillage and ignition of the material. Bonding and grounding procedures will be in place when transferring flammable liquids from their designated containers and into equipment. Equipment will never be fueled in the back of a pick-up truck containing a bed liner. Personnel handling explosive and/or flammable materials will wear cotton under- and outer-garments to prevent buildup and transfer of static electricity.

9.17.1 Fire Protection

Through appropriate use and storage of flammable products, USA intends to prevent fires as much as feasible during operations on this site. Should a fire occur, all site teams will have at least one ABC fire extinguisher with them during the course of operations. Fire extinguishers are the first line of defense should a fire start in this location. USA personnel will be trained in the use of fire extinguishers and they will be instructed to try to fight a fire only in the incipient stages. If the fire is too large to fight, personnel will evacuate the site and the UXOSO will call in the Fire Department, who will stand no closer than fragmentation distance from the fire to fight or prevent spreading of the fire. If it is possible to safely do so, USA will remove any flammable and/or combustible materials from the path of the fire.

Portable fire extinguishers are rated and classified with NUMERAL and LETTER designations, based on fire tests conducted by the Underwriters Laboratories, Inc. or other nationally recognized testing laboratories. The numeral rating indicates the relative extinguishing effectiveness of extinguishers classified for Class A and B fires only. The letter classification coincides with the Class of Fire. Extinguishers found to be effective on more than one Class of fire have multiple-letter classifications (Example: A:B:C:D).

The rating of hand-portable fire extinguishers is based on the following definitions.

- Class A fire extinguisher is used for ordinary combustible materials.
- Class B fire extinguisher is for flammable liquids.
- Class C fire extinguisher is for electrical fires.
- Class D fire extinguisher is for combustible metal fires.

Many fires are small at origin and may be extinguished by the use of proper hand-portable fire extinguishers. It is strongly recommended that the Fire Department be notified as soon as a fire is discovered. This alarm should not be delayed awaiting result of application of portable fire extinguishers.

Fire extinguishers can represent an important segment of any overall fire protection program. However, their successful functioning depends upon meeting the following conditions.

- The extinguisher is properly located and in working order.
- The extinguisher is of proper type for a fire that may occur.
- The fire is discovered while still small enough for the extinguisher to be effective.
- The fire is discovered by a person ready, willing, and able to use the extinguisher.

Class A fires can be readily extinguished by quenching-cooling with water or a water-mixture agent. Class B fires are more effectively extinguished by an agent that blankets-smothers the fire through exclusion of oxygen surrounding the fire area. Those extinguishers containing bromochlorodifluoromethane, monobromotrifluoromethane, carbon dioxide, or dry chemical are generally best suited for extinguishing Class B fires.

For Class C fires, the primary consideration in extinguishing this type of fire is the selection of nonconductive extinguishing agent to prevent dangerous electrical shock and possible death to user. Water or water-mixture type extinguishing agent must not be used under any circumstances on energized electrical equipment (Class C) fires. When possible, electrical equipment and circuits should be de-energized before attacking a Class C fire. Due to its corrosive nature, dry chemical is not recommended for use on computerized, electronic, or other equipment with extensive circuitry.

9.18 WILD LAND FIRE MANAGEMENT PLAN

In order to prevent grass fires from starting in the area, USA will control employee smoking. Smoking will be permitted only in designated areas. These areas will be equipped with a fire extinguisher, as well as a can containing sand, where cigarette butts can be safety discarded without concern for the spread of fire. All lighters and matches will remain in the designated smoking area and will not be permitted into the site. All flammable liquids brought to the site for the purpose of fueling equipment, will be stored in an approved flammable liquid container in a designated flammable liquid storage area. No smoking will be permitted within 50 ft of the storage or use of flammable materials.

In the event that a grass fire does start in the area, all personnel will be trained in the use of fire extinguishers, and fire extinguishers will be available to all site operations. Fire extinguishers are designed for the incipient stages of a fire, which is when they are most effective. If a large fire starts, employees will be instructed to evacuate the area to at least fragmentation distance from the site and to contact the Fire Department via telephone at 911. The Fire Department will remain at least fragmentation distance from the fire and implement applicable procedures to prevent the fire from spreading outside of the fragmentation distance.

9.19 HAZARDOUS ENERGY CONTROL PLAN

NA

9.20 CRITICAL LIFT PLAN

NA

9.21 CONTINGENCY PLAN FOR SEVERE WEATHER

Rain and severe wind conditions can constitute a safety hazard to field operations at this site. This site may also experience snowstorms and icy conditions. The UXOSO will monitor the weather closely. If the area becomes icy, wet, muddy, slippery, deep with snow, or windy such that an unacceptable level of risk exists for personnel who are working in proximity to MEC items, then MEC operations will cease until the UXOSO determines it to be safe to continue.

No MEC operations will take place if an electrical storm is within 10 miles of the site. An electrical storm monitor will be used to determine if an electrical storm is approaching. MEC operations will cease when an electrical storm is within 10 miles of the site, and will not resume again until the UXOSO determines that the electrical storm is at least 10 miles past the site.

Daily weather conditions will be a part of the daily briefing. Many people incur injuries or are killed due to misinformation and inappropriate behavior during severe weather. During severe weather, project personnel will seek shelter in an appropriate location (e.g., building or vehicle).

If a snowstorm is approaching, the UXOSO will monitor local weather forecasts regarding the strength of the storm and anticipated accumulations of snow. The UXOSO will also monitor conditions on the ground in order to determine at what point to shut down the operation. If snow or icy conditions will require local

road closures, the UXOSO will close the site operations and send personnel back to their lodging for shelter until the storm passes and roads are opened. If roads are closed by local authorities, site vehicles may not be used. In these cases, there is a serious risk of an accident, and if an accident occurs vehicle insurance will not cover damages. When the road closure is lifted, the UXOSO may determine when it is safe to resume operations, based on conditions at the site.

The individual is ultimately responsible for his/her personal safety and has the right to take appropriate action when threatened by severe weather.

9.21.1 Safe Locations during Severe Weather and Locations to Avoid

No place is absolutely safe from severe weather; however, some places are safer than others.

- Large enclosed structures (substantially constructed buildings) tend to be much safer than smaller or open structures.
- The risk for lightning injury depends on whether the structure incorporates lightning protection, construction materials used, and the size of the structure.
- In general, fully enclosed metal vehicles such as cars, trucks, buses, or vans with the windows rolled up, provide good shelter from many weather conditions.

AVOID being in or near high places and open fields, light poles, metal fences, and water (lakes, streams, rivers, or wet surfaces).

When inside a building AVOID use of the telephone, washing your hands, or any contact with conductive surfaces with exposure to the outside such as metal door or window frames, electrical wiring, telephone wiring, cable TV wiring, or plumbing, if lightning is a factor.

9.21.2 Safety Guidelines for Individuals

Generally speaking, identify and seek shelter that is appropriate for the type of severe weather you are encountering. Proper shelter will always include a sound structure and will remove you from the elements.

When available, pay attention to weather warning devices such as National Oceanic and Atmospheric Administration weather radio and/or credible weather detection systems. However, do not let this information override good common sense.

9.22 FLOAT PLAN

NA

9.23 FALL PROTECTION AND PREVENTION PLAN

NA

9.24 DEMOLITION PLAN (ENGINEERING AND ASBESTOS SURVEYS)

NA

9.25 EXCAVATION/TRENCHING PLAN

Excavation work will occur as part of this PWS for the purpose of investigation of MEC to required depths of up to 4 ft. Earth will be excavated to the designated depths and UXO Technicians will be inspecting the soil for any MEC items. Barricades will be placed around open pits to prevent personnel from falling into them, and ground guides will be used to prevent heavy equipment from approaching too close to the edge of an excavation. Due to the depths of these excavations, sloping and/or shoring will not be required.

9.25.1 Work Practices

Excavation work presents serious risks to all workers involved. For this reason, all USA employees involved in excavation or other surface opening projects will be familiar with the potential safety hazards and be knowledgeable in the appropriate safety measures needed to ensure a safe working environment on excavation projects.

- The Competent Person (CP) who will be the UXOSO on this site, will ensure the location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installation that reasonably may be expected to be encountered during excavation work, has been determined prior to the opening of an excavation.
- Utility companies or owners will be within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations.
- When utility companies or owners cannot respond to a request within 24 hours - excluding weekends and holidays - (or longer if required by state or local law), or if the exact location of installations cannot be established, excavation may proceed with caution, provided detection equipment or other means to locate utility installations are used.
- All surface encumbrances (trees, poles, boulders, etc.) that are located so as to create a hazard will be removed or supported, as necessary, to safeguard employees.
- Adequate barrier physical protection will be provided at all open excavations. The excavation will be barricaded with warning signs posted, or covered to prevent accidental falls by persons in the area.
- The CP will ensure a ladder, or other safe means of egress, is located in the excavation. If a ladder is used, it must extend at least 3 ft above grade level and be secured from movement.
- The CP will ensure that no work is allowed in excavations where water is accumulating unless adequate precautions have been taken to protect against the hazards posed by water accumulation.
- If water is controlled or prevented from accumulating by the use of water removal equipment, operations will be monitored by a competent person to ensure proper operation.
- Employees will be protected from loose rock or soil which could fall or roll from the excavation face. Such protection will consist of scaling to remove loose material or the installation of barriers.
- All spoil material will be placed at least 2 ft from the edge of the excavation. It is strongly recommended that spoils be placed four or more feet from the excavation edge so as not to cover surface indicators of subsidence (such as fissures or cracks). Placing the spoil material near the edge also adds an increased weight to the supporting structure of the excavation and may increase the likelihood of a cave-in.
- An inspection will be conducted by the CP prior to the start of work and daily when field activities involve excavations. Inspections will also be made after every rainstorm or other hazard-increasing occurrence. The Trench Safety Field Report will be completed during the daily inspection. A copy of the inspection report will be included in the project file.
- No employees will be permitted to enter the excavation unless they are specifically required to do so. Unauthorized persons will not be allowed access.
- Where the CP finds evidence of a situation that could result in a possible cave-in or other hazardous conditions (e.g., hazardous atmospheres), workers will leave the area until the necessary precautions have been taken to ensure their safety. The area will be re-inspected by the CP prior to restart of work if the hazardous condition involved health and safety issues (e.g., hazardous atmospheres).
- Work in an excavation will be supervised at all times by a USA Supervisor. This individual will remain outside of the excavation and will be responsible for identifying any unusual developments aboveground which may warn of impending earth movement.

- The CP will ensure that materials or equipment used on the project, which might fall or roll into an excavation, are kept at least 2 ft from the edge of a vertical excavation and never be allowed on the sloping portion of any excavation. A general rule of thumb for good operating practices is to keep employees or equipment at a distance from the edge of the excavation equal to the excavation depth.
- When mobile equipment is operated adjacent to an excavation, and the operator does not have a clear and direct view of the edge of the excavation, the CP will ensure a ground guide is in place to provide direction to the equipment operator.
- The CP will ensure the excavation is barricaded or covered when the project site is unattended. Upon completion of excavation work, it will be backfilled.
- In the event local traffic needs to be interrupted during site operations, e.g., to move a piece of heavy equipment, the local traffic control authority will be contacted for proper procedures.
- Employees exposed to public vehicular traffic will be provided with, and will wear, warning vests or other suitable garments marked with or made of reflective or high-visibility material.
- All heavy equipment operating in the vicinity of an excavation will be operated in accordance with the USA Heavy Equipment Program. No employees will be permitted to have any part of their body underneath loads handled by lifting or digging equipment. Employees will be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded provided the vehicles are equipped with protection as specified in 29 CFR 1926.601(b)(6).

9.26 EMERGENCY RESCUE (TUNNELING)

NA

9.27 UNDERGROUND CONSTRUCTION FIRE PREVENTION AND PROTECTION PLAN

NA

9.28 COMPRESSED AIR PLAN

NA

9.29 FORMWORK AND SHORING ERECTION AND REMOVAL PLANS

NA

9.30 PRECAST CONCRETE PLAN

NA

9.31 LIFT SLAB PLANS

NA

9.32 STEEL ERECTION PLAN

NA

9.33 SITE SAFETY AND HEALTH PLAN FOR HAZARDOUS TOXIC OR RADIOACTIVE WASTE (HTRW) WORK

NA

9.34 BLASTING SAFETY PLAN

NA

9.35 DIVING PLAN

NA

9.36 CONFINED SPACE PROGRAM

NA

9.37 MACHINERY AND MECHANIZED EQUIPMENT

Heavy equipment to be used on this site consists of a mini-excavator for soil excavation operations and a 320 long-reach excavator with blast protection for pond excavations. The vegetation clearance operations will also involve heavy equipment for tree harvesting and chipping. Before any machinery or mechanized equipment is placed into use, it will be inspected and tested by a competent mechanic and certified to be in safe operating condition. Records of tests and inspections will be maintained at the site and reported in the Daily Quality Control (QC) Report. The following safety procedures will be adhered to on sites using heavy machinery and equipment.

- USA will designate a CP to be responsible for the inspection of all machinery and equipment daily and during use, to make sure it is in safe operating condition. Tests will be made at the beginning of each day during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition. Another visual inspection will be made at the end of the day in order to determine conditions that may need to be corrected prior to operations the following day.
- Preventive maintenance procedures recommended by the manufacturer will be followed.
- Any machinery or equipment found to be unsafe will be immediately removed from service and its use prohibited until unsafe conditions have been corrected. A tag indicating that the equipment will not be operated will be placed in a conspicuous location on the equipment. The tag will remain until it is demonstrated to the individual tagging out the equipment that it is safe to operate. Where possible, lockout procedures will be used.
- Inspections or determinations of road conditions and structures (e.g., bridges, etc.) will be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment.
- Only Licensed/Qualified personnel will operate machinery and mechanized equipment. Equipment deficiencies observed at any time that affect safe operation will be corrected before continuing operation.
- Seats and seat belts will be installed and used by operators and passengers of heavy equipment. The only exception to this requirement will be for heavy equipment designed for stand-up operation.
- Getting off or on any equipment while it is in motion is prohibited.
- Machinery or equipment requiring an operator will not be permitted to run unattended.
- Machinery or equipment will not be operated in a manner that will endanger individuals or property, nor will the safe operating speeds or loads be exceeded.
- All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
- All repairs on machinery or equipment will be made by the owner of the equipment.
- Equipment buckets will be fully lowered when not in use.
- Equipment operated on the highway will be equipped with turn signals visible from the front and rear.
- No heavy equipment operations will take place during hours of darkness.

- Mobile type equipment, operating within an off-highway job site not open to public traffic, will have a service brake system and a parking brake system capable of stopping and holding the equipment fully loaded on the grade of operation.
- Mechanized equipment will be shut down prior to and during fueling operations. Closed systems, with automatic shut-off, which will prevent spillage if connections are broken, may be used to fuel diesel powered equipment left running.
- All towing devices used on any combination of equipment will be structurally adequate for the weight drawn and securely mounted.
- Persons will not be permitted to get between a towed and towing piece of equipment except to connect the equipment.
- All equipment with windshields will be equipped with powered wipers. Vehicles that operate under conditions that cause fogging or frosting of windshields will be equipped with operable defogging or defrosting devices.
- Whenever the equipment is parked, the parking brake will be set. Equipment parked on inclines will have the wheels chocked or track mechanism blocked and the parking brake set.
- Personnel will not work or pass underneath the loads of digging equipment.
- Personnel will approach the bucket only if it is on the ground, to prevent being struck by objects falling out of the bucket, especially rocks or MEC.
- Each piece of heavy equipment on-site will be equipped with at least one dry chemical or carbon-dioxide fire extinguisher, having a minimum Underwriters Laboratories (UL) rating of 5-B:C.
- A warning device and signal person will be provided where there is danger to nearby workers from moving equipment, swinging loads, buckets, booms, etc.
- Personnel will be prohibited from entering the swing zone of the equipment while it is in operation.
- Where manual (hand) signals are used, only one person will be designated to give signals to the operator. The signal person will be located so as to see the load and be clearly visible to the operator.
- Employees will be required to stay clear from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.
- Motor vehicles will not be located in the EZ during operation of heavy equipment.
- No smoking or open flames will be permitted around heavy equipment utilized on-site.
- A site safety meeting will be conducted and documented as to the safety concerns pertaining to that day's use of heavy equipment.
- The local traffic authority will be contacted for proper procedures to follow in the event local traffic needs to be interrupted during site operations.
- To protect the public from the site's hazards, the Project Manager or SUXOS will determine a safe distance around the work area and place barricades, construction fencing, barrier tape, etc., around the work site to prevent entry.
- Loose, ill-fitting clothing can get caught in heavy equipment; therefore, proper fitting clothing will be worn during field activities which involve heavy equipment.
- Long hair that extends below the hard hat will be tied in a manner to prevent contact with moving equipment parts.
- Due to the fact that chemical hazards are not anticipated on this site, a Site Specific Decontamination Plan is not required. Equipment operated in the EZ will simply be brush- and hose-cleaned before entering the support zone or leaving the site.

All self-propelled construction equipment, whether moving alone or in combination, will be equipped with a reverse signal alarm. The alarm will be audible and sufficiently distinct to be heard under prevailing conditions. The alarm will operate automatically upon commencement of backward motion. The alarm

may be continuous or intermittent (not to exceed 3-sec intervals) and will operate during the entire backward movement. Electrical alarms will meet SAE J 994b. Equipment designed and operated so that the operator is always facing the direction of motion does not require reverse signal alarms. The reverse signal alarms will be in addition to requirements for signal persons. The following additional safety guarding and/or devices are required.

- All belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating or moving parts of equipment will be guarded when exposed to contact by individuals or otherwise create a hazard. Guarding will meet the requirements of ANSI 815.1, Safety Standards for Mechanical Power Transmission Apparatus.
- All hot surfaces of equipment, including exhaust pipes or other lines, will be guarded or insulated to prevent injury and fire. Fuel tanks will be located in a manner that will not allow spills or overflows to run onto engine, exhaust, or electrical equipment.
- Exhaust or discharges from equipment will be so directed that they do not endanger persons or obstruct the view of the operator.
- 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.
- Suitable protection against the elements, falling or flying objects, equipment roll-over, swinging loads and similar hazards will be provided for operators of all machinery or equipment. Broken or cracked glass will be replaced as soon as possible.

9.37.1 PPE Around Heavy Equipment Operations

The following personal protective equipment will be required of all persons working with or near heavy equipment operations:

- Hard hats and safety-toe boots will be worn at all times when working around heavy equipment. Steel toe boots may not be worn in the vicinity of magnetometer operations. Composite toe footwear is recommended in these instances.
- Safety glasses will be worn at all times when working around heavy equipment.
- Hearing protection will be worn within 25-ft when heavy equipment is in operation unless the UXOSO has measured and determined the noise levels to be less than 85-decibel Amperes (dBA) on a time weighted average basis.

Employees exposed to public vehicular traffic will be provided with, and will wear warning vests or other suitable garments marked with or made of reflective or high-visibility material.

This space is intentionally left blank.

This page is intentionally left blank.

APPENDIX A. OSHA FORM 300

This Appendix contains a copy of OSHA Form 300 to be used on this project.

This space is intentionally left blank.

This page is intentionally left blank.

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year _____

U.S. Department of Labor
Occupational Safety and Health Administration

You must record information about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an injury and illness incident report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Form approved OMB no. 1218-0176

Establishment name USA Environmental, Inc.

City _____ State _____

Identify the person				Describe the case		Classify the case											
						CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:					
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	Death	Days away from work	Remained at work		Away From Work (days)	On job transfer or restriction (days)	(M) Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses
								Job transfer or restriction	Other record-able cases								
						(G)	(H)	(I)	(J)	(K)		(1)	(2)	(3)	(4)	(5)	(6)
					Page totals	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses	
(1)	(2)	(3)	(4)	(5)	(6)	

Public reporting burden for this collection of information is estimated to average 14 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.

APPENDIX B. ACTIVITY HAZARD ANALYSIS

This Appendix contains the following Activity Hazard Analyses applicable to work on this project:

- Instrument Verification Strip
- Location, Survey and Mapping
- Vegetation Removal
- Munitions and Explosives of Concern (MEC) Investigation
- MPPEH Inspection and Certification
- MEC Disposal Operations
- Identifying Asbestos Containing Material
- Biological Survey
- Onwater Boating Activities/Pond Benthic Study
- Draining of Pond
- MEC Investigation of Debris Piles
- Vehicle Operations
- Quality Control.

This space is intentionally left blank.

This page is intentionally left blank.

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): L

Date: 5 April 2013 Project: MEC Investigation/Removal Act.

Activity: Instrument Verification Strip (IVS)

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Using geophysical equipment, the UXOQCS will locate a plot of land where an IVS can be prepared and ensure there are no buried anomalies in the area.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards. • Muscle strain carrying instruments. • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants. • Sunburn	• On-site MEC training • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations. • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellant and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants. • Ensure First Aid Kits and Fire Extinguishers are in place. • No smoking, except in designated areas.	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Using inert ordnance or other items that would give off a similar signature, the UXOQCS will bury these items at differing depths and directions throughout the IVS. • The UXOQCS will prepare a map of the IVS showing all of the buried items.	• Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments, using shovels • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Cuts and abrasions from handling rocks or buried debris during burial of inert ordnance • Sunburn	• Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Keep personnel to a minimum during operations • Use and enforce the buddy system • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellant and barrier creams as necessary • Use leather or canvas work gloves for hand protection • PPE IAW this AHA • Wear cap for head protection and use sunscreen. • Wear long or short sleeved shirts and long pants. • Ensure 1st. Aid Kits and Fire Extinguishers are in place. • No smoking, except in designated areas.	L
X	• Each day, prior to use of geophysical equipment, each person will test the equipment on the IVS. • If the geophysical equipment is able to locate all buried items in the IVS, it will be used for work that day. • If the geophysical equipment is not able to locate all buried items in the IVS, it will be removed from service until repairs can be made. Another piece of equipment will be tried until one is found tha can detect all buried items in the IVS.	• Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments • Heat stress/cold stress • Biological hazards - Insects, spiders, rodents and hazardous plants • Sunburn	• Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Keep personnel to a minimum during operations • Use and enforce the buddy system • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellant and barrier creams • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure 1st. Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X				

Add Items

EQUIPMENT	TRAINING	INSPECTION

ACTIVITY HAZARDS ANALYSIS

	EQUIPMENT	TRAINING	INSPECTION
X	• Footwear with ankle support and non-slip soles (no steel toe footwear around magnetometer operations). • Back braces (optional) • Appropriate clothing and PPE (to include leather or canvas work gloves, safety glasses or goggles, long or short sleeved shirt and long pants, and cap).	• PPE Training	• PPE inspected daily prior to use
X	• Appropriate geophysical equipment • Shovel	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • Equipment familiarity training • On site MEC training • Site-specific training, slip/fall hazards • Site-specific training/lifting techniques	• UXOSO will ensure that all controls are being followed; all equipment is being utilized correctly and all personnel have received appropriate training. • Equipment inspected daily prior to use. • Geophysical equipment check at IVS
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • Equipment familiarity training • All site personnel will have current HAZWOPER training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

Involved Personnel:

Acceptance Authority (digital signature): Robert D Crownover

Digitally signed by Robert D. Crownover
DN: cn=Robert D. Crownover, o=USA Environmental, Inc., ou=Safety and Quality, email=rcrownover@usatampa.com, c=US
Date: 2013.04.10 13:09:02 -04'00'

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): L

Date: 5 April 2013 Project: MEC Investigation/Removal Act.

Activity: Location, Survey and Mapping

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• UXO personnel will accompany survey team to site. • UXO personnel will lead team into area and will clear the path of entry into the site. If MEC is encountered, path will be routed around it. • If MEC/MPPEH is encountered, the area will be marked and photographed.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments/equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

ACTIVITY HAZARDS ANALYSIS

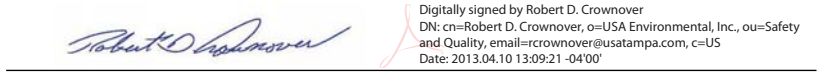
	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Where intrusive operations, such as driving stakes, are required UXO personnel, using geophysical equipment, will determine if there are anomalies beneath the ground surface. • If anomalies are located below the ground surface, the area for the intrusive operations will be moved. • When clear area is located, the stakes will be driven. • Location data will be prepared and submitted at completion of work.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X				
X				

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	• Footwear with ankle support and non-slip soles (no steel toe footwear around magnetometer operations) • Back braces (optional) • Appropriate clothing and PPE (to include leather or canvas work gloves, safety glasses or goggles, long or short sleeved shirts and long pants, and caps)	• PPE Training	• PPE inspected daily prior to use
X	• Appropriate geophysical equipment • Stakes • Pin flags	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • On site MEC training • Equipment familiarity training • Site-specific training, slip/fall hazards • Site-specific training/lifting techniques	• UXOSO will ensure that all controls are being followed; all equipment is being utilized correctly and all personnel have received appropriate training. • Equipment inspected daily prior to use • Geophysical equipment check at IVS
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

ACTIVITY HAZARDS ANALYSIS

Involved Personnel:

Acceptance Authority (digital signature): 

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): M

Date: 6 April 2013

Project: MEC Investigation/Removal Act.

Activity: Vegetation Removal

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• If there are areas where dense vegetation prevents a complete surface clearance and a DGM survey of subsurface shows MEC contamination in the area, vegetation removal will be conducted as needed. • Prior to vegetation removal, a UXO Technician will survey areas of thick vegetation with a magnetometer in order to verify the absence of surface MEC. • MEC will be flagged for disposal.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments and equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Establish Exclusion Zone • Maintain team separation distance • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier cream as necessary • Follow appropriate lifting/carrying procedures • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Use sunscreen • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X	• If MEC is encountered, a blow in place disposal operation will be performed prior to allowing vegetation clearance in the area in accordance with the AHA for MEC Disposal Operations.	IAW AHA for MEC Disposal Operations	IAW AHA for MEC Disposal Operations	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Vegetation clearing will be performed using gasoline-powered weed eaters, chain saws, etc.	• MEC hazards • Uneven walking surfaces – slip, trip, fall hazards • Muscle strain carrying instruments and equipment • Lacerations and cuts from vegetation clearing equipment • Eye/face injuries due to use of vegetation clearing equipment • Noise • Fire hazards • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Establish exclusion zone • Maintain team separation distance • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy safety toe leather work boots with ankle support and non-slip soles. • Follow appropriate lifting/carrying procedures • Tools and equipment will be used in the manner in which it was designed • Vegetation removal crew will maintain distance of at least 20 feet from each other • Chainsaw engines will be started and stopped when all co-workers are clear of the saw • Chainsaws will be properly supported when in use • Operator will shut off saw when carrying chainsaw over slippery surfaces, through heavy brush, and when adjacent to personnel • Never use chainsaw above shoulder height • Chopping tools with loose or cracked heads or splintered handles will not be used • PPE IAW this AHA • Never fuel equipment in back of a truck with a bed liner. Do it on the ground. • No smoking within 50 feet of fueling operations • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier cream as necessary • Wear long sleeved shirts and long pants • Use sunscreen • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	M
X				

Add Items

EQUIPMENT	TRAINING	INSPECTION

ACTIVITY HAZARDS ANALYSIS

	EQUIPMENT	TRAINING	INSPECTION
X	• Sturdy safety toe leather footwear with ankle support and non-slip soles • Back braces, optional • Appropriate clothing and PPE to include safety glasses or goggles, leather or canvas work gloves, hard hat, face shield, hearing protection, leg chaps, long sleeved shirt and long pants.	• PPE Training • Noise prevention training	• PPE inspected daily prior to use
X	• Vegetation removal equipment: weed eaters, chain saws, etc.	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • Equipment familiarity training • Site-specific MEC training will be presented to all site personnel • On site MEC training • Site-specific training, slip/fall hazards • Site-specific training/lifting techniques	• UXOSO will ensure that all controls are being followed; all equipment is being utilized correctly and all personnel have received appropriate training • Equipment inspected daily prior to use
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

Involved Personnel:

Acceptance Authority (digital signature): Robert D Crownover

Digitally signed by Robert D. Crownover
DN: cn=Robert D. Crownover, o=USA Environmental, Inc., ou=Safety and Quality, email=rcrownover@usatampa.com, c=US
Date: 2013.04.10 13:11:23 -04'00'

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): M

Date: 5 April 2013 Project: MEC Investigation/Removal Act.

Activity: MEC Investigation

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Locate anomalies using geophysical equipment. • Reacquire selected anomalies from dig sheet.	• MEC hazards • Unauthorized personnel entering site during operations • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC Training • Establish exclusion zone around project site • Establish separation distance between teams • Site control measures will be implemented (fencing, barricades, signage) and exclusion zone established • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Carefully dig up MEC using hand tools and identify it's type and condition.	• MEC hazards • Unauthorized personnel entering site during operations • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments and using hand tool • Heat Stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC Training • Establish exclusion zone around project site • Establish separation distance between teams • Site control measures will be implemented (fencing, barricades, signage) and exclusion zone established • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Follow appropriate lifting/carrying procedures • Tools and equipment will be used in the manner for which it was designed to be used • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Heavy equipment will be used to excavate soil to no closer than 12 inches above an anomaly. • When soil has been removed to 12 inches above an anomaly with heavy equipment, the anomaly will then be manually excavated.	• MEC hazards • Unauthorized personnel entering site during operations • Uneven working surfaces – slip, trip, fall hazards • Heat Stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Heavy equipment hazards • Excavation hazards • Noise • Sunburn	• On-site MEC Training • Establish exclusion zone around site • Establish separation distance between teams working on the site • If MEC is encountered, it will be reported, and only UXO trained personnel will inspect/handle MEC • Cease operations if unsafe conditions arise • Keep personnel to a minimum during operations • Use and enforce the buddy system • Site control measures will be implemented (fencing, barricades, signage, road closures) • Be observant while walking. Use sturdy leather composite toe work boots with ankle support, composite toes, and non-slip soles • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Trained heavy equipment operators • Daily inspection of heavy equipment • Lexane shield for operator • Maintain clearance around heavy equipment • Use ground guides with heavy equipment • Heavy equipment will never be left unattended while the engine is engaged • Heavy equipment will be stored with the bucket placed in the ground position. • Avoid heavy equipment contact with overhead or buried power lines • Operator will wear seat belt while operating heavy equipment • The operator will not exceed the load limits on the piece of heavy equipment in use • Site personnel are not permitted to ride in or on heavy equipment as passengers • PPE IAW this AHA • Never place any part of the body under a raised load • Place spoil material at least two feet away from edge of excavation • Ensure spill containment materials are available for spills/leaks. • Properly position heavy equipment and establish safety area prior to commencing operations. • Check area prior to movement of equipment; ensure backup signal is operational. • Use sunscreen • Ensure First Aid Kits and Fire Extinguishers are in place. • No smoking, except in designated areas. • Wear lightweight cotton shirts and long pants. • Use insect repellent as necessary.	M

ACTIVITY HAZARDS ANALYSIS

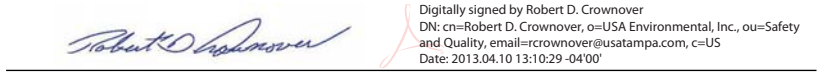
	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• MPPEH will be inspected by two UXO Technicians and MDAS will be removed and placed in a secured container for storage until the end of the project, when it will be shipped to a qualified recycler, per AHA for Inspection/ Certification of MPPEH.	IAW AHA for Inspection/Certification of MPPEH	IAW AHA for Inspection/Certification of MPPEH	L
X	• UXO Technicians will perform blow in place disposal operations on MEC that is encountered, in accordance with AHA for MEC Disposal Operations.	IAW AHA for MEC Disposal Operations	IAW AHA for MEC Disposal Operations	M

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	• Footwear with ankle support and non-slip soles (no steel toe footwear around magnetometers) • Back braces (optional) • Appropriate clothing and PPE to include safety glasses or goggles, leather or canvas work gloves, long or short sleeved shirt and long pants, and cap • Around heavy equipment operations: Hard hat, safety glasses or goggles, leather or canvas work gloves, long or short sleeved shirts and long pants, and composite toe footwear with ankle support and non-slip soles	• PPE Training	• PPE inspected daily prior to use
X	• Appropriate geophysical equipment • Heavy equipment - excavator • Barricades and signage • Pin Flags • Shovels/hand tools	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • Site-specific MEC training will be presented to all site personnel • Heavy equipment operator training • Heavy equipment training for personnel working in the vicinity of heavy equipment operations • Equipment familiarity training • Site-specific training, slip/fall hazards • Site-specific training/lifting techniques	• UXOSO will ensure that all controls are being followed; all equipment is being utilized correctly and all personnel have received appropriate training • Equipment inspected daily prior to use • Geophysical equipment check at IVS
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

ACTIVITY HAZARDS ANALYSIS

Involved Personnel:

Acceptance Authority (digital signature): 

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): M

Date: 6 April 2013

Project: MEC Investigation/Removal Act.

Activity: MPPEH Inspection and Certification

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• When MPPEH is encountered, two UXO Technicians will inspect and verify that it is MDAS. • After a disposal operation, disposal team will check area of the shot for MPPEH and two UXO technicians will inspect and verify that it is MDAS.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards. • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants. • Cuts/lacerations. • Sunburn	• On-site MEC training • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	M

ACTIVITY HAZARDS ANALYSIS

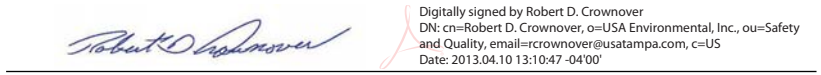
	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• MDAS will be placed in a secured bin on the site until the completion of site operations, when it will be certified and transferred to an approved recycler for disposition. • The bin will remain secured to prevent intermingling of scrap items. • QC Specialist will inspect bin periodically to ensure procedures are followed and no live MEC is intermingled	• Uneven working surfaces – slip, trip, fall hazards. • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants. • Cuts/lacerations. • Sunburn	• Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • Keep personnel to a minimum during operations • Use and enforce the buddy system • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X				

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	• Leather work boots with ankle support and non-slip soles • Appropriate clothing and PPE to include leather or canvas work gloves, safety glasses or goggles, long or short sleeved shirts and long pants, cap	• PPE Training	• PPE inspected daily prior to use
X	• MDAS bin, secured.	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • Site-specific MEC training will be presented to all site personnel • Site-specific training, slip/fall hazards	• UXOSO will ensure that all controls are being followed; all equipment is being utilized correctly and all personnel have received appropriate training
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT Monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training. • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

Involved Personnel:

ACTIVITY HAZARDS ANALYSIS

Acceptance Authority (digital signature): 

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): M

Date: 5 April 2013

Project: MEC Investigation/Removal Act.

Activity: MEC Disposal Operations

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• All disposal will be a blow in place operation. • Identify item. • Evacuate project disposal area, except for personnel involved in disposal operation to outside of the EZ. • Exclusion zone will be MFD of the disposal item(s).	• MEC hazards • Unauthorized personnel entering the site • Uneven working surfaces – slip, trip, fall hazards • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC Training • Establish exclusion Zone • Controlled use of radios and cell phones • Site control measures will be implemented (fencing, barricades, signage) and exclusion zone established • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Ensure First Aid Kits and Fire Extinguishers are in place. • No smoking, except in designated areas.	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Prepare shot.	• MEC hazards • Unauthorized personnel entering the site • Uneven working surfaces – slip, trip, fall hazards • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC Training • Establish exclusion Zone • Controlled use of radios and cell phones • Site control measures will be implemented (fencing, barricades, signage) and exclusion zone established • Cease operations if unauthorized person enters site • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Ensure 1st. Aid Kits and Fire Extinguishers are in place. • No smoking, except in designated areas.	M
X	• Personnel performing disposal evacuate to at least fragmentation distance.	• MEC hazards • Unauthorized personnel entering the site • Uneven working surfaces – slip, trip, fall hazards • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC Training • Establish exclusion Zone • Controlled use of radios and cell phones • Site control measures will be implemented (fencing, barricades, signage) and exclusion zone established • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Ensure 1st. Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

ACTIVITY HAZARDS ANALYSIS

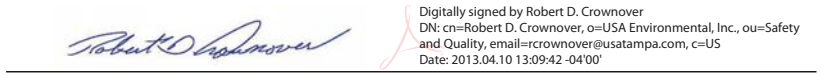
	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Perform disposal operation.	• MEC hazards • Unauthorized personnel entering the site • Uneven working surfaces – slip, trip, fall hazards • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Noise • Sunburn	• On-site MEC Training • Establish exclusion Zone • Controlled use of radios and cell phones • Site control measures will be implemented (fencing, barricades, signage) and exclusion zone established • Make required notifications • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	M
X	• Check to see that disposal operation was successful. • If not successful, repeat disposal operation.	• MEC hazards • Unauthorized personnel entering the site • Uneven working surfaces – slip, trip, fall hazards • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC Training • Establish exclusion Zone • Controlled use of radios and cell phones • Site control measures will be implemented (fencing, barricades, signage) and exclusion zone established • Cease operations if unauthorized person enters site • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Ensure First. Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

Add Items

ACTIVITY HAZARDS ANALYSIS

	EQUIPMENT	TRAINING	INSPECTION
X	• Leather work boots with ankle support and non-slip soles • Appropriate clothing and PPE to include leather or canvas work gloves, safety glasses or goggles, hearing protection, long or short sleeved shirt and long pants, and cap	• PPE Training	• PPE inspected daily prior to use
X	• Appropriate blasting equipment and explosives	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • Training in use of blasting equipment • Site-specific MEC training will be presented to all site personnel • Site-specific training, slip/fall hazards	• UXOSO will ensure that all controls are being followed; all equipment is being utilized correctly and all personnel have received appropriate training • Equipment inspected daily prior to use
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT Monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

Involved Personnel:

Acceptance Authority (digital signature): 

	PRINT	**SIGNATURE**	
SUXOS Name:	____________________	____________________	**Date/Time:** ____________________
UXOSO Name:	____________________	____________________	**Date/Time:** ____________________
Employee Name(s):	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________
	____________________	____________________	**Date/Time:** ____________________

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): L

Date: 28 August 2013 Project: MEC Investigation/Removal Act.

Activity: Identifying Asbestos Containing Material

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• During the performance of the Remedial Investigation, personnel may encounter construction debris. • Due to the potential for asbestos containing material (ACM) in certain types of construction debris (roofing material, tile, and insulation), site personnel will proceed with caution. • When construction debris is encountered, wet it down thoroughly.	• MEC hazards • ACM • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments/equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Asbestos Awareness Training provided to all site personnel • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles . • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks. Minimize exposure to cold temperatures, water and wind by wearing layered clothing and wet weather gear, keeping the feet dry (carry extra socks) • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Examine the construction debris more closely to determine if there is potential ACM present.	• MEC hazards • ACM • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments/equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Asbestos Awareness Training provided to all site personnel • Keep area wet. • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks. Minimize exposure to cold temperatures, water and wind by wearing layered clothing and wet weather gear, keeping the feet dry (carry extra socks) • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X	• If potential ACM is encountered, evacuate area.	• MEC hazards • ACM • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments/equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Asbestos Awareness Training provided to all site personnel • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks. Minimize exposure to cold temperatures, water and wind by wearing layered clothing and wet weather gear, keeping the feet dry (carry extra socks) • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Parsons sampling team will enter the area and take samples of the potential ACM and send to laboratory for analysis.	• MEC hazards • ACM • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments/equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Asbestos Awareness Training provided to all site personnel • Keep area wet • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks. Minimize exposure to cold temperatures, water and wind by wearing layered clothing and wet weather gear, keeping the feet dry (carry extra socks) • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA for Level C • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	• Footwear with ankle support and non-slip soles • Back braces (optional) • Appropriate clothing and PPE (to include leather or canvas work gloves, safety glasses or goggles, long or short sleeved shirts and long pants, and caps) • Level C PPE for ACM sampling: Tyvek or similar type coveralls with hood, safety glasses or goggles, leather or canvas work gloves, leather work boots with ankle support and non-slip soles, boot covers, air purifying respirator with HEPA filters	• PPE Training	• PPE inspected daily prior to use
X	• Sampling equipment • Water	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • On site MEC training • Asbestos Awareness Training for all site personnel • Equipment familiarity training • Procedures training • Site-specific training, slip/fall hazards • Site-specific training/lifting techniques	• UXOSO will assure that all controls are being followed; all equipment is being correctly utilized and that all personnel have received appropriate training. • Equipment inspected daily prior to use

ACTIVITY HAZARDS ANALYSIS

	EQUIPMENT	TRAINING	INSPECTION
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

Involved Personnel:

Acceptance Authority (digital signature): Robert D Crownover

Digitally signed by Robert D. Crownover
DN: cn=Robert D. Crownover, o=USA Environmental, Inc., ou=Safety and Quality, email=rcrownover@usatampa.com, c=US
Date: 2013.09.06 16:28:45 -04'00'

	PRINT	SIGNATURE	
SUXOS Name:	____________	____________	Date/Time: ____________
UXOSO Name:	____________	____________	Date/Time: ____________
Employee Name(s):	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________
	____________	____________	Date/Time: ____________

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): L

Date: 5 April 2013

Project: MEC Investigation/Removal Act.

Activity: Biological Survey

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• UXO personnel will accompany survey team to site. • UXO personnel will lead team into area and will clear the path of entry into the site. If MEC is encountered, path will be routed around it. • If MEC/MPPEH is encountered, the area will be marked and photographed for later disposal.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments/equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

ACTIVITY HAZARDS ANALYSIS

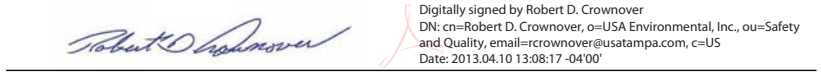
	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Perform biological survey of pond area habitat, flora and fauna.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X				
X				

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	• Footwear with ankle support and non-slip soles (no steel toe footwear around magnetometer operations) • Back braces (optional) • Appropriate clothing and PPE (to include leather or canvas work gloves, safety glasses or goggles, long or short sleeved shirts and long pants, and caps)	• PPE Training	• PPE inspected daily prior to use
X	• Appropriate geophysical equipment • Pin flags	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • On site MEC training • Equipment familiarity training • Site-specific training, slip/fall hazards • Site-specific training/lifting techniques	• UXOSO will ensure all controls are being followed; all equipment is being utilized correctly and that all personnel have received appropriate training. • Equipment inspected daily prior to use • Geophysical equipment check at IVS
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

ACTIVITY HAZARDS ANALYSIS

Involved Personnel:

Acceptance Authority (digital signature): 

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC)
(Use highest code): L

Date: 10 April 2013 Project: MEC Investigation/Removal Act.

Activity: Onwater Boating Activities/Pond Benthic Study

Activity Location: Site 12 EOD Area, Brunswick ME

Prepared By: W. Rottner/Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Identify the hazards associated with boat operations. • SSHO will inspect boat for physical condition and condition and presence of required safety and rescue equipment. • Personnel will load and stow supplies and equipment	• Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments/equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn • Weather hazards	• The subcontractor providing the boat will ensure that boat is well maintained and in good condition prior to taking on passengers • The subcontractor providing the boat will ensure that Captain and vessel are licensed in accordance with local requirements • Emergency radios will be in operating condition prior to leaving the wharf. There will be a primary and alternate means of communication, and extra batteries will be available. • Directions for contacting the Coast Guard and hospital will be posted with each radio and cell phone • Boat will be equipped with rescue equipment to handle a man-overboard situation (such as rescue hook, life preserver with rope, or similar equipment) • Fire extinguishers and first aid kit must be readily available • Block, brace, and secure cargo from movement during transportation • Personnel will wear close-toed shoes with non-slip soles and will avoid walking in wet areas of the boat that may be slippery • Adequate supply of drinking water will be available • Personnel will not ride in boat during electrical storm, or if electrical storm is approaching within 10 miles, or during other severe weather. • Follow appropriate lifting/carrying procedures • Heat stress monitoring, cool drinking water, cool shelter for breaks, work/rest cycles • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for break • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • PPE IAW this AHA • Personnel will wear caps and use sunscreen • Personnel will not ride in boat during electrical storm, or if electrical storm is approaching	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Ship Captain will give safety briefing prior to transport of personnel.	• Slip, trip and fall hazards • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Weather hazards • Sunburn	• The subcontractor providing the boat will ensure that boat is well maintained and in good condition prior to taking on passengers • The subcontractor providing the boat will ensure that Captain and vessel are licensed in accordance with local requirements • Emergency radios will be in operating condition prior to leaving the wharf. There will be a primary and alternate means of communication, and extra batteries will be available. Cell phone will be available with Site Supervisor. • Directions for contacting emergency responders and hospital will be posted with each radio and cell phone • Personnel will attend daily safety briefing by Captain prior to transport by boat, and will obey all directions from the Captain during transport • Look before boarding/disembarking and hold onto something sturdy to steady yourself when boarding or disembarking vessels. Watch carefully as you move around on the dock or in the vessel. • All passengers will wear USCG-approved Type II personal flotation device (PFD) at all times while on boat. • Boat will be equipped with rescue equipment to handle a man-overboard situation (such as rescue hook, life preserver with rope, rope bag with a minimum of 90 feet of rope, etc.), readily available. • Audible and visual signals (air horn, flares, distress flag, distress light) will be readily available on the boat. • Fire extinguishers and first aid kit must be readily available • Personnel will wear close-toed shoes with non-slip soles and will avoid walking in wet areas of the boat that may be slippery • Personnel will not ride in boat during electrical storm, or if electrical storm is approaching within 10 miles, or during other severe weather. • Personnel will wear caps and use sunscreen • Heat stress monitoring, cool drinking water, cool shelter for breaks, work/rest cycles • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for break • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • PPE IAW this AHA	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Captain will operate boat to transport personnel to desired destination	• Potential for boat accidents during transport • Potential for malfunction of boat engine or equipment • Fire hazards • Drowning hazards • Slip, trip and fall hazards • Heat stress/cold stress • Weather hazards • Sunburn	• The subcontractor providing the boat will ensure that boat is well maintained and in good condition prior to taking on passengers • The subcontractor providing the boat will ensure that Captain and vessel are licensed in accordance with local requirements • Emergency radios will be in operating condition prior to leaving the wharf. There will be a primary and alternate means of communication, and extra batteries will be available. Cell phone will be available with Site Supervisor. • Directions for contacting the emergency response personnel and hospital will be posted with each radio and cell phone • Personnel will attend daily safety briefing by Captain prior to transport by boat, and will obey all directions from the Captain during transport • All passengers will wear USCG-approved Type II personal flotation device (PFD) at all times while on boat. • Personnel will remain seated while boat is in motion • Boat will be equipped with rescue equipment to handle a man-overboard situation (such as rescue hook, life preserver with rope, rope bag with a minimum of 90 feet of rope, etc.), readily available. • Audible and visual signals (air horn, flares, distress flag, distress light) will be readily available on the boat. • Fire extinguishers and first aid kit must be readily available • Personnel will wear close-toed shoes with non-slip soles and will avoid walking in wet areas of the boat that may be slippery • Personnel will not ride in boat during electrical storm, or if electrical storm is approaching within 10 miles, or during other severe weather. • Personnel will wear caps and use sunscreen • Heat stress monitoring, cool drinking water, cool shelter for breaks, work/rest cycles • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for break • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • PPE IAW this AHA	L

ACTIVITY HAZARDS ANALYSIS

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC

ACTIVITY HAZARDS ANALYSIS

X	• Perform Pond Benthic Survey. • A scan sonar will be used under water in order to detect MEC under water at various depths. • This is an MEC avoidance operation that will be performed remotely from boats on the surface of the water. • At no time will physical contact be made with MEC.	• Underwater MEC hazards • Uneven, wet and/or moving working surfaces of the boat – slip, trip, fall hazards • Muscle strain carrying instruments/equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents • Noise • Drowning hazards • Sunburn • Hazardous weather conditions • Fire from sparks from engine • Refueling - fire	• On-site MEC Training • The subcontractor providing the boat will ensure that boat is well maintained and in good condition prior to taking on passengers • The subcontractor providing the boat will ensure that Captain and vessel are licensed in accordance with local requirements • Aware of proper boat operation (right-of-ways), drive defensively, keep wide berth from other boats/equipment, Bow man watch out for floating debris, etc. Observe and comply with safety markers • All gasoline engines, except outboards, installed in the vessels must have an approved backfire flame arrestor fitted to the carburetor. • Emergency radios will be in operating condition prior to leaving the wharf. There will be a primary and alternate means of communication, and extra batteries will be available. • Directions for contacting the emergency response personnel and hospital will be posted with each radio and cell phone • Personnel will attend daily safety briefing by Captain prior to transport by boat, and will obey all directions from the Captain during transport • Boat will be equipped with rescue equipment to handle a man-overboard situation (such as rescue hook, life preserver with rope, rope bag with a minimum of 90 feet of rope, etc.), readily available • When sampling using a rope the engine shall be in neutral or shut off so as not to get tangled in the propeller. Rope loose on the deck shall be kept to a minimum and shall not be looped or wrapped around any part of sampling personnel. For this task rope will only be used for tie off of vessels and will be spooled by the cleats. • Personnel will wear rubber soled shoes to prevent slipping while on boat, and will avoid stepping in wet areas that could be slippery • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for break. If water temperature drops below 40 degrees F, cold water survival suits shall be worn. A thermometer will be available on site. • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear long or short sleeved shirts and long pants • PPE IAW this AHA • All personnel will wear personal flotation devices while on boat. • Personnel will not ride in boat during electrical storm, or if electrical storm is approaching within 10 miles, or during other severe weather • Engine will be shut off and there will be no smoking when refueling equipment or filling gasoline containers. Sorbent pads will be surrounding fuel areas in case of leaks/spills. Allow equipment to cool before refueling. • Use sunscreen and wear cap • Fire extinguishers and first aid kit must be readily available	L

ACTIVITY HAZARDS ANALYSIS

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	• Footwear with rubber soles to prevent slipping • Back braces (optional) • Appropriate clothing and PPE (to include personal flotation device, canvas or leather gloves, safety sunglasses and cap). Hearing protection will be required if noise from boat engine or generator reaches hazardous levels.	• PPE Training	• PPE inspected daily prior to use
X	• Boats - R/V Passaic – NJ0116FV – 20 ft. pontoon boat - Pine Scout 18' – PA4206DF • Scan sonar/magnetometer • Generator • Sampling equipment and supplies	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • Site specific MEC training will be presented to all site personnel • Training in boat safety procedures • Equipment familiarity training • Site-specific training, slip/fall hazards • Site-specific training/lifting techniques • Training in lifting and carrying techniques • All site personnel will have current HAZWOPER training	• UXOSO will ensure that all controls are being followed; all equipment is being correctly utilized and that all personnel have received appropriate training • Equipment inspected daily prior to use • Inspect boat for damage, ensure there is adequate fuel, life vests, etc. Check engine idling prior to leaving dock. Engage engine and pull away slowly from dock to ascertain proper engine operation and to avoid collisions
X	• Communications equipment - Cell phone/Marine Radio with extra batteries on hand • First aid kit • Fire extinguishers • Man overboard rescue equipment (hook, rope, life ring) • WBGT monitor	• Emergency response procedures • Heat Stress symptoms/first aid • Site-specific biological hazards to include first aid • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

Involved Personnel:

Acceptance Authority (digital signature): Robert D. Crownover

Digitally signed by Robert D. Crownover
DN: cn=Robert D. Crownover, o=USA Environmental, Inc., ou=Safety and Quality, email=rcrownover@usatampa.com, c=US
Date: 2013.04.12 08:12:58 -04'00'

	PRINT	SIGNATURE	
SUXOS Name:	____________________	____________________	Date/Time:____________________
UXOSO Name:	____________________	____________________	Date/Time:____________________
Employee Name(s):	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________
	____________________	____________________	Date/Time:____________________

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): L

Date: 9 April 2013

Project: MEC Investigation/Removal Act.

Activity: Draining of Pond

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• UXO Technicians will clear a path of entry to the site where pump will be set up. • If MEC is observed, path will be routed around it.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments/equipment • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• On-site MEC training • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Set up 4" - 6" trailer-mounted or skid-mounted trash pump at South end of pond.	• Uneven working surfaces – slip, trip, fall hazards • Muscle strain positioning equipment • Pinching/crushing hazards • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• Use and enforce the buddy system • Be observant while walking. Use sturdy leather safety toe work boots with ankle support and non-slip soles. • Follow appropriate lifting procedures: Lift with legs and not back, avoid pinch points • Use care when removing trailer with equipment from towing vehicle, and ensure wheels are chocked to avoid crushing hazards. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure 1st. Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X	• Pumping performed by starting pump upon arrival at job site and shutting off at end of day.	• Objects getting stuck in pump • Accumulation of water at pump discharge area causing a slip/fall hazard • Erosion causing a slip/fall hazard • Equipment overheating/fire hazard • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Sunburn	• Suction inlet screened to prevent objects larger than 1/2 inch from entering • Discharge broadcast over boards to disperse the concentrated flow. • A rock area will be set up (if required) to discharge water into, as a means of erosion control. • Daily inspection of equipment, and routine monitoring of equipment throughout the day to ensure it is running properly and not overheating • Bonding/grounding procedures used in fueling equipment • Sources of ignition not permitted within 50 feet of equipment used for flammable liquid storage or use • Use and enforce the buddy system • Be observant while walking. Use sturdy leather safety toe work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• If pond recharges too quickly, overnight operation of the pump may be required	• Accumulation of water at pump discharge area	• Suction inlet screened to prevent objects larger than 1/2 inch from entering • Discharge broadcast over boards to disperse the concentrated flow. • A rock area will be set up (if required) to discharge water into, as a means of erosion control. • Daily inspection of equipment, and routine monitoring of equipment throughout the day to ensure it is running properly and not overheating • Bonding/grounding procedures used in fueling equipment • Sources of ignition not permitted within 50 feet of equipment used for flammable liquid storage or use • Use and enforce the buddy system • Be observant while walking. Use sturdy leather safety toe work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • Wear cap for head protection and use sunscreen • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	• Footwear with ankle support and non-slip soles (no steel toe footwear around magnetometer operations) • Back braces (optional) • Appropriate clothing and PPE (to include leather or canvas work gloves, safety glasses or goggles, long or short sleeved shirts and long pants, and caps)	• PPE Training	• PPE inspected daily prior to use
X	• Appropriate geophysical equipment • Trailer-mounted or skid-mounted trash pump • Boards for water dispersion • Rocks for erosion prevention	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • On site MEC training • Equipment familiarity training • Site-specific training, slip/fall hazards • Site-specific training lifting techniques	• UXOSO will ensure all controls are being followed; all equipment is being utilized correctly and that all personnel have received appropriate training. • Equipment inspected daily prior to use • Geophysical equipment check at IVS

ACTIVITY HAZARDS ANALYSIS

	EQUIPMENT	TRAINING	INSPECTION
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

Involved Personnel:

Acceptance Authority (digital signature): Robert D Crownover

Digitally signed by Robert D. Crownover
DN: cn=Robert D. Crownover, o=USA Environmental, Inc., ou=Safety and Quality, email=rcrownover@usatampa.com, c=US
Date: 2013.04.10 13:08:33 -04'00'

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): M

Date: 6 April 2013

Project: MEC Investigation/Removal Act.

Activity: MEC Investigation of Debris Piles

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• UXO Technicians will sort through debris piles in order to inspect and separate debris into MEC, MDAS, and non-MEC-related debris.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards. • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants • Cuts/lacerations • Sunburn	• On-site MEC training • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather safety toe work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	M

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• MDAS will be placed in a secured bin on the site until the completion of site operations, when it will be certified and transferred to an approved recycler for disposition. • The bin will remain secured to prevent intermingling of scrap items. • QC Specialist will inspect bin periodically to ensure procedures are followed and no live MEC is intermingled	• Uneven working surfaces – slip, trip, fall hazards. • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants. • Cuts/lacerations. • Sunburn	• Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • Keep personnel to a minimum during operations • Use and enforce the buddy system • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X	• MEC that is acceptable to move will be taken to a designated disposal area. • MEC that is unsafe to move will undergo a blow in place disposal operation	IAW with AHA for MEC Disposal	IAW AHA for MEC Disposal	M
X	• Non-MEC-related debris will be placed in a designated staging area until the end of the project, when disposal will take place.	• Uneven working surfaces – slip, trip, fall hazards. • Heat stress/cold stress • Biological hazards - insects, spiders, rodents and hazardous plants. • Cuts/lacerations. • Sunburn	• Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles. • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • Keep personnel to a minimum during operations • Use and enforce the buddy system • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	

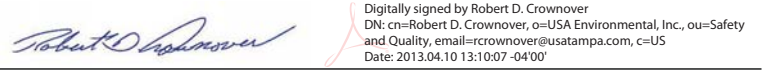
Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	• Leather safety toe work boots with ankle support and non-slip soles • Appropriate clothing and PPE to include leather or canvas work gloves, safety glasses or goggles, long or short sleeved shirts and long pants, cap	• PPE Training	• PPE inspected daily prior to use

ACTIVITY HAZARDS ANALYSIS

	EQUIPMENT	TRAINING	INSPECTION
X	• MDAS bin, secured.	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • Site-specific MEC training will be presented to all site personnel • Site-specific training, slip/fall hazards	• UXOSO will ensure that all controls are being followed; all equipment is being utilized correctly and all personnel have received appropriate training
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT Monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training. • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

Involved Personnel:

Acceptance Authority (digital signature): 

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC) (Use highest code): L

Date: 6 April 2013

Project: MEC Investigation/Removal Act.

Activity: Vehicle Operations

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Identify the hazards associated with vehicle operations • Inspect vehicle	• Fire hazards • Vehicle hazards	• Never leave the vehicle running unattended • Daily vehicle inspections will be performed to ensure a safe operating vehicle • Must have a valid driver's license. If transporting explosives on public roads, must have CDL. • Fire extinguisher and first aid kit must be with vehicle. If transporting explosives, two fire extinguishers are required. • Never fuel a vehicle loaded with explosive cargo • No smoking is permitted in vehicles	L
X	• Load cargo into vehicle • Fill out DD Form 626 when transporting explosives	• Fire hazards • MEC hazards • Proper use of vehicle for field operations	• Use the parking brake if parked on inclines and/or as necessary • Never leave the vehicle running unattended • Observe all MEC safety precautions, such as movement, heat, shock, and friction • Only UXO trained personnel will transport explosives • Load and unload vehicles in designated areas only • Ensure vehicle is chocked while loading/unloading cargo • Block, brace, and secure cargo from movement during transportation • Transport explosives using approved containers and methods • When transporting explosive materials over public roads, ensure vehicle is properly placarded on all four sides of vehicle • Must have a valid driver's license. If transporting explosives on public roads, must have CDL. • Fire extinguisher and First Aid kit must be with vehicle. If transporting explosives, two fire extinguishers are required. • Never fuel a vehicle loaded with explosive cargo	L

ACTIVITY HAZARDS ANALYSIS

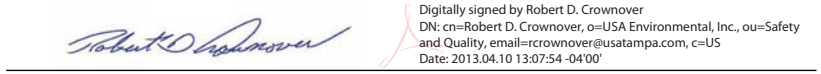
	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Drive to destination	• Potential for vehicle accidents during field operations • MEC hazards • Fire hazards • Vehicle hazards	• Always wear a seat belt • Use a ground guide when reversing and/or as needed • Obey the speed limit • Obey all traffic signs • Use established roads • Use the parking brake if parked on inclines and/or as necessary • Never leave the vehicle running unattended • Use only authorized explosive routes when transporting explosives • When transporting explosive materials over public roads, ensure vehicle is properly placarded on all four sides of vehicle. • Must have a valid driver's license. If transporting explosives on public roads, must have CDL • Fire extinguisher and First Aid kit must be with vehicle. If transporting explosives, two fire extinguishers are required • Never fuel a vehicle loaded with explosive cargo • No passengers will be transported in back of a pick-up truck. All passengers will be in a seat with a seat-belt in use during vehicle operation. • Operator of vehicle will not use electronic wireless devices while operating a vehicle (cell phone, ipad, use of internet, check or send email, check or send text messages, etc.) • If use of electronic wireless devices is required, operator will pull vehicle off to the side of the road or other safe parking place, park the vehicle and then proceed to use the device. No electronic devices will be used under any circumstance if vehicle is loaded with explosive cargo. • No smoking is permitted in vehicles	L
X				

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X	• Vehicles • Placards • Blocking/bracing materials	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • Valid Driver's license (CDL for transporting explosives) • Vehicle familiarity training	• UXOSO will ensure that all controls are being followed; all equipment is being utilized correctly and all personnel have received appropriate training. • Vehicle inspected daily prior to use
X	• First Aid Kit • Fire Extinguishers • Communication equipment	• Fire extinguisher training • All site personnel will have current HAZWOPER training • Emergency procedures training • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly
X			

ACTIVITY HAZARDS ANALYSIS

Involved Personnel:

Acceptance Authority (digital signature): 

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

ACTIVITY HAZARDS ANALYSIS

Overall Risk Assessment Code (RAC)
(Use highest code): L

Date: 6 April 2013

Project: MEC Investigation/Removal Act.

Activity: Quality Control

Activity Location: Site 12 EOD Area, Brunswick, ME

Prepared By: Cheryl M. Riordan, CSP

Risk Assessment Code Matrix

E = Extremely High Risk
H = High Risk
M = Moderate Risk
L = Low Risk

Severity	Probability				
	Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Add Identified Hazards

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Inspection of Site Conditions, Work Performance and Operations.	• MEC hazards • Uneven working surfaces – slip, trip, fall hazards • Muscle strain carrying instruments • Heat stress/cold stress • Cuts, lacerations, eye and face hazards due to vegetation removal operations • Noise due to vegetation clearance operations, heavy equipment operations, and MEC disposal operations • Biological hazards - insects, spiders, rodents and hazardous plants • Heavy equipment hazards • Sunburn	• On-site MEC Training • Establish exclusion zone around operation • Maintain minimum separation distance between teams • Post barriers and barricades as necessary prior to commencing operations and maintain positive site control • Observe all MEC safety precautions, and follow safe work practices • Be alert. Cease operations if unsafe conditions arise • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Follow appropriate lifting/carrying procedures • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • PPE IAW this AHA • Hearing protection around noise hazard operations • Wear long or short sleeved shirts and long pants • Wear cap or hard hat for head protection and use sunscreen • Training in bioloical hazards avoidance • Use insect repellent and barrier creams as necessary • Trained heavy equipment operators • Daily inspection of heavy equipment • Maintain clearance around heavy equipment • Use ground guides with heavy equipment • Heavy equipment will never be left unattended while the engine is engaged • Heavy equipment will be stored with the bucket placed in the ground position. • Avoid heavy equipment contact with overhead or buried power lines • Operator will wear seat belt while operating heavy equipment • The operator will not exceed the load limits on the piece of heavy equipment in use • Site personnel are not permitted to ride in or on heavy equipment as passengers • Never place any part of the body under a raised load • Place spoil material at least two feet away from edge of excavation • Ensure spill containment materials are available for spills/leaks. • Properly position heavy equipment and establish safety area prior to commencing operations. • Check area prior to movement of equipment, ensure backup signal is operational. • Ensure First Aid Kits and Fire Extinguishers are in place. • No smoking, except in designated areas.	L

ACTIVITY HAZARDS ANALYSIS

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X	• Inspection of Material and Packaging of Containers.	• Explosive hazards • Uneven working surfaces – slip, trip, fall hazards • Heat stress/cold stress • Biological hazards - insects, spiders, rodent and hazardous plants • Sunburn	• On-site MEC Training • Establish exclusion zone around operation • Post barriers and barricades as necessary prior to commencing operations and maintain positive site control • Observe all MEC safety precautions, and follow safe work practices • Be alert. Cease operations if unsafe conditions arise • Keep personnel to a minimum during operations • Use and enforce the buddy system • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles (no steel toe footwear in the vicinity of magnetometer operations). • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X	• Inspection of Completed Project Documentation.	• Uneven working surfaces – slip, trip, fall hazards • Heat stress/cold stress • Biological hazards - insects, spiders and hazardous plants • Sunburn	• Ensure required site documentation is on hand • Ensure logs, briefings, reports and forms are completed in a timely and accurate manner • Review or inspect all site generated documents for accuracy and deliverability • Ensure concerned parties receive copies of documents pertaining to their activities • Ensure contract deliverables have been met • Be observant while walking. Use sturdy leather work boots with ankle support and non-slip soles • Heat stress monitoring, drinking water, work-rest schedule, and cool shelter for breaks • Cold stress monitoring, drinking water, drinking warm decaffeinated liquids, work-rest schedule, and warm shelter for breaks • Training in biological hazards avoidance • Use insect repellent and barrier creams as necessary • PPE IAW this AHA • Wear long or short sleeved shirts and long pants • Wear cap for head protection and use sunscreen • Ensure First Aid Kits and Fire Extinguishers are in place • No smoking, except in designated areas	L
X				

ACTIVITY HAZARDS ANALYSIS

	EQUIPMENT	TRAINING	INSPECTION
	Add Items		

	EQUIPMENT	TRAINING	INSPECTION
X	• Footwear with ankle support and non-slip soles (no steel toe footwear around magnetometers) • Back braces (optional) • Appropriate clothing and PPE to include leather or canvas work gloves, safety glasses or goggles, long or short sleeved shirt and long pants, cap. Hearing protection added for MEC disposal operations. • For vegetation removal operations: Hard hats, face shields, hearing protection, leg chaps, leather or canvas work gloves, safety glasses or goggles, long or short sleeved shirt and long pants.	• PPE Training	• PPE inspected daily prior to use
X	• Appropriate geophysical equipment • Barricades and signage	• UXO personnel will meet training and experience requirements outlined in DDESB TP 18 • Equipment familiarity training • Site-specific MEC training will be presented to all site personnel • Site-specific training, slip/fall hazards • Site-specific training/lifting techniques	• UXOSO will ensure that all controls are being followed; all equipment is being utilized correctly and all personnel have received appropriate training • Equipment inspected daily prior to use • Geophysical equipment check at IVS
X	• Communications equipment • First aid kit • Fire extinguishers • WBGT monitor	• Training in emergency procedures • Heat stress/cold stress symptoms/first aid • Site-specific flora/fauna to include first aid • All site personnel will have current HAZWOPER training • Equipment familiarity training	• Communications equipment checked daily prior to use • First aid kits checked daily and inspected weekly • Fire extinguishers checked daily and inspected weekly • Equipment inspected daily prior to use

Involved Personnel:

Acceptance Authority (digital signature): Robert D. Crownover

Digitally signed by Robert D. Crownover
DN: cn=Robert D. Crownover, o=USA Environmental, Inc., ou=Safety and Quality, email=rcrownover@usatampa.com, c=US
Date: 2013.04.10 13:11:06 -04'00'

	PRINT	SIGNATURE	
SUXOS Name:			**Date/Time:**
UXOSO Name:			**Date/Time:**
Employee Name(s):			**Date/Time:**
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:
			Date/Time:

APPENDIX C. SITE HEALTH AND SAFETY PLAN

This Appendix contains a copy of the Site Health and Safety Plan (SHSP) to be used on this project.

This space is intentionally left blank.

This page is intentionally left blank.

SITE HEALTH AND SAFETY PLAN (SHSP)

Site 12 EOD Area
Former NAS Brunswick
Brunswick, Maine

Plan Approval:

Cheryl M. Riordan

Date: 9/23/13

Cheryl M. Riordan, CSP
Corporate Health and Safety Manager
USA Environmental, Inc.
(757) 689-4737

Plan Concurrence:

Robert O. Crownover

Date: 9/23/13

Robert Crownover
Director of Safety and Quality
USA Environmental, Inc.
(813) 343-6364

This page is intentionally left blank.

TABLE OF CONTENTS

LIST OF TABLES

This space is intentionally left blank.

ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	Asbestos Containing Material
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
CDC	Centers for Disease Control
CFR	Code of Federal Regulations
CHSM	Corporate Health and Safety Manager
CPR	Cardiopulmonary Resuscitation
CWM	Chemical Warfare Materiel
°F	Degree Fahrenheit
dBA	decibel Ampere
DCN	Document Change Notice
EMS	Emergency Medical Services
EOD	Explosive Ordnance Disposal
ERCP	Emergency Response and Contingency Procedures
ERT	Emergency Response Team
EZ	Exclusion Zone
ft	foot, feet
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	High-Efficiency Particulate Air
HFD	Hazardous Fragment Distance
HPS	Hantavirus Pulmonary Syndrome
IVS	Instrument Verification Strip
MEC	Munitions and Explosives of Concern
MGFD	Munition with the Greatest Fragmentation Distance
mm	millimeter
MPPEH	Material Potentially Presenting an Explosive Hazard
MSD	Minimum Separation Distance
MSDS	Material Safety Data Sheet
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
OSHA	Occupational Safety and Health Administration
PA	Preliminary Assessment
PEL	Permissible Exposure Limit
PPE	Personal Protective Equipment
RMSF	Rocky Mountain Spotted Fever
RPM	Remedial Project Manager
SHSP	Site Health and Safety Plan
SI	Site Inspection
SOW	Statement of Work
SUXOS	Senior Unexploded Ordnance Supervisor

SZ	Support Zone
TLV	Threshold Limit Value
TWA	Time-Weighted Average
USA	USA Environmental, Inc.
UXO	Unexploded Ordnance
UXOSO	Unexploded Ordnance Safety Officer
WBGT	Wet Bulb Globe Temperature

This space is intentionally left blank.

INTRODUCTION

This Site Health and Safety Plan (SHSP) establishes the responsibilities, requirements and procedures for protecting the project personnel and the surrounding community from the hazards associated with the MEC Investigation/Removal Action at Site 12 Explosive Ordnance Disposal (EOD) Area, Former Naval Air Station (NAS) Brunswick, Brunswick, Maine.

1.0 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

1.1 SITE DESCRIPTION

See Section 2.4 of the Accident Prevention Plan (APP).

1.2 CONTAMINANT CHARACTERISTICS

Common munitions disposed at the Site 12 EOD Area included ordnance, pyrotechnics, privately manufactured explosive devices, and war souvenirs. Presented in Table 1-1 below is a list of munitions disposed of at Site 12 EOD Area as reported in the Preliminary Assessment (PA) Addendum [adapted from the Second Five Year Review Report (EA Science & Technology, 2005)] and munitions and related items located during the 2010 Site Inspection (SI). The EA Science and Technology 2005 Second Five Year Review contained the information which was used to establish the PA Addendum list. That information contains a list of all items detonated at the Site 12 EOD Area between 1991 and 2003.

Table 1-1: Munitions Disposed of at Site 12 EOD Area

Munitions Type (as reported in PA)
Dynamite: Military M1
Detonating Cord
U.S. Sonobuoy, AN/SSQ-110 & AN/SSQ-110A
Single Base, Double Base, and Composite Propellants
U.S. Flare, Aircraft, Parachute, MK 24 MOD 1, 2, 2A, 3, & 4
U.S. Bomb, 100-LB, GP, MK 4 MOD 1
U.S. Signal, Night Depth, MK 2
U.S. Bomb, AT, MK 118 MODS 0 & 1
M69 Practice Hand Grenade
U.S. Signal, Smoke & Illuminating, Submarine: MK 66, MK 117, MK 118; MODS 1 & 2
M30 Practice Hand Grenade
U.S. Marker, Location, Submarine, MK 21, MK 22, MK 23, & MK 24 MOD 0
U.S. Torpedo, Submarine-Launched Anti-Surface Torpedo, MK 14
U.S. Torpedo, Air-Dropped, Surface-Launched, Anti-Surface Torpedo, MK 13
U.S. Bomb, Signal Cartridge, MK 5 MOD 0
U.S. Bomb, Signal Cartridge, MK 4 MODS 0-4
U.S. Signal, Smoke Marker, M62, M64, M65, M66
U.S. Simulator, Explosive Booby-Trap, Flash, M117; ILLUM, M118; Whistling, M119
Charge, Demolition: Block M112

Munitions Type (as reported in PA)
Black Powder
U.S. 90mm HE Projectile, M71
81mm Mortar
U.S. Projectile, 81mm, HE, M43A1
Cartridge, 60mm TP, M50 Series
Cartridge, 40mm: Parachute White Star, M583A1, Green Star M661, Red star M662
Cartridge, 40mm White Star Cluster, M585
U.S. Projectile, 40mm, AA, BL&P, MK 1, MK 2
U.S. Projectile, 37mm, GUN, HE, M54A1
U.S. Cartridge, 30mm, HEI, M799 with Fuze, M759
.30 Caliber Ammunition
Cartridge, 25mm HEI-Tracer, M792 with Fuze PDSQ M758
.38 Caliber Small Arms Ammunition
Cartridge, Ball, .45 Caliber M1911
.50 Caliber Small Arms
U.S. Rocket, 2.25-IN, Practice, 2.25-IN NAVY A.R.
3-IN Projectile, MK 29 MOD 1&2
3-IN Projectile, MK 31 MOD 1
Rocket, HE, 3.5-IN: AT M28A2
Rocket, Practice, 3.5-IN: M29A2
5-IN Projectile, ILLUMINATION, MK 43 MOD 0
U.S. Rocket Warhead, 5-IN, Smoke, MK 34 MOD 0
7.62mm Small Arms Ammunition
12 Gage Shotgun, NO 00

Munitions Type (2010 SI and Trenching Activities)
U.S. Bomb, 500-LB, GP, MK 82 (with MK31 safety device in fuze well
40mm Practice Grenade
40mm Cartridge Casing with Primer
Smoke Grenade, M-18 fuzed
20mm Projectile
M-904 Bomb nose fuze
75 mm Projectile Base
AN/ MK228 tail fuze
Bulk High Explosive
Bulk Propellant

.

Chemical Warfare Materiel (CWM): The site is not suspected to contain chemical warfare materiel (CWM). However, if suspect CWM is encountered during any phase of site activities, USA Environmental, Inc. (USA) personnel will immediately withdraw 450 ft upwind from the work area, secure the site, and contact the Naval Facilities Engineering Command (NAVFAC) Remedial Project Manager (RPM). USA will maintain security at the site until written direction, via a Document Change Notice (DCN), is provided by NAVFAC MIDLANT regarding the procedure to be followed.

Asbestos Containing Materials (ACM): Throughout the Site 12 area, construction debris may be encountered. As certain types of construction debris (e.g., roofing materials, tiles and insulation) from the 1970's and earlier is known to contain asbestos, USA will proceed with caution whenever construction debris is observed. The debris will be thoroughly wet down prior to examining it more closely to determine whether potential ACM may be among the debris. Should potential ACM be observed, USA personnel will evacuate the area and Parsons personnel will don Level C PPE in order to perform sampling activities to confirm whether ACM is present. If the laboratory confirms the material to be ACM, the PM will notify the NAVFAC RPM of the situation and await further instructions on how to proceed.

2.0 HAZARD RISK ANALYSIS

An Activity Hazard Analysis (AHA) has been conducted and documented for each activity warranted by the hazards associated with the activity (see Attachment 2 of the APP for the site-specific AHAs). For the Site 12 EOD Area, the following AHAs have been prepared for all anticipated field operations:

- Instrument Verification Strip (IVS)
- Location, Survey and Mapping
- Vegetation Removal
- Munitions and Explosives of Concern (MEC) Investigation
- Material Potentially Presenting an Explosive Hazard (MPPEH)
- MPPEH Inspection and Certification
- MEC Disposal
- Identifying Asbestos Containing Materials
- Biological Survey
- Onwater Boating Activities/Pond Benthic Study
- Draining of Pond
- MEC Investigation of Debris Piles
- Vehicle Operations
- Quality Control.

Should conditions, equipment, or types of operations change during the course of the project work, the Corporate Health and Safety Manager (CHSM) will update an existing AHA for continuing work, or prepare a new AHA for new operations. The site exclusion zone (EZ) will be based on the 132-ft hazardous fragment distance (HFD) of the 40mm Mk2 projectile, which is the primary Munition with the Greatest Fragmentation Distance (MGFD) for this site. The fragmentation distance around the site footprint is for the protection of the general public and other operations on the installation. A separation distance of at least 23 ft will also be established between UXO teams, to protect individual operating units in the event of an accidental detonation while site operations are underway. This represents the K40 distance of the MGFD. Should a more hazardous round be encountered during operations, the EZ and minimum separation distances (MSD) would be expanded to the contingency MGFD, which is the 90mm M71 projectile, which has a HFD of 288 ft and a K40 distance of 50 ft.

Risk management is and will continue to be integrated into the planning, preparation, and execution of all operations at the Site 12 EOD Area. Risk management is a dynamic process, and is continuously improved upon as personnel become more familiar with the site operations, equipment, and environment. Site personnel are trained to continuously identify hazards and assess accident risks. Once identified,

these hazards will be brought to the attention of the Senior Unexploded Ordnance Supervisor (SUXOS) or Unexploded Ordnance Safety Officer (UXOSO). Control measures will be developed and coordinated by USA safety personnel. All site personnel are responsible for continuous assessment of variable hazards and the implementation of risk controls.

2.1 CLASSIC SAFETY

Due to the nature of planned site operations, the potential risk for exposure to safety hazards is high. Anticipated safety hazards that may be encountered during site activities, and precautions to be followed, are listed below and in individual AHAs.

2.1.1 Slip, Trip, and Fall Hazards

Site slip, trip, and fall hazards include uneven walking/working surfaces, rocks and vegetation. Holes from excavation work may also present fall hazards. Site personnel will be instructed to make themselves aware of foot placement at all times to avoid slips, trips, and falls. The use of sturdy leather work boots with ankle support and non-slip soles will reduce the risk of slips, trips, and falls. Barricades will be placed around open pits to prevent accidental falls into them.

2.1.2 Cuts/Laceration Hazards

Cuts and lacerations can be caused by a number of issues on the site, to include handling MEC, rocks and vegetation, as well as the use of tools and equipment. Personnel will be instructed to wear canvas or leather work gloves during site operations to prevent injury to hands.

2.1.3 Hand Tool Operation

Use of improper or defective tools can contribute significantly to the occurrence of accidents on site. Therefore, the safe work practices listed below will be observed when using hand tools.

- Hand tools will be inspected for defects prior to each use.
- Defective hand tools will be removed from service and repaired or discarded.
- Tools will be selected and used in the manner for which they were designed.
- Be sure of footing and grip before using any tool.
- Do not use tools that have split handles, mushroom heads, worn jaws, or other defects.
- Gloves will be worn whenever they increase gripping ability or if cut, laceration, or puncture hazards may exist during the use of hand tools.
- Safety glasses with side shields, goggles, or a face shield will be used if tool use presents an eye/face hazard.
- Do not use makeshift tools or other improper tools.
- Use non-sparking tools where there are explosive vapors, gases, or residue.
- Do not remove or modify any guard or safety device on any power hand tool.

2.1.4 Excavation Operations

Excavation operations using hand tools and excavators will be taking place on this site at depths of up to 4 ft. No sloping or shoring will be required. For additional information on excavation safety requirements see the APP, Section 9.25.

2.1.5 Explosive Ordnance

MEC may be present and located during site activities. UXO-qualified personnel will follow the requirements of the USA Safety Program, and the Basic Safety Concepts and Considerations for Ordnance and Explosives Operations, which outline the safety and health precautions to be taken if MEC are encountered. All non-UXO qualified personnel will follow the safe work practices listed below.

- Non-UXO qualified personnel will receive site-specific MEC recognition training prior to participation in site activities.
- No soil-penetrating activities will be allowed without the area first being cleared by UXO qualified personnel.
- Non-UXO qualified personnel will be escorted on site by UXO-qualified personnel, until such time as the area is cleared.
- Once an area has been cleared and flagged, non-UXO qualified personnel may perform duties in the area unescorted, but will not leave the cleared area unescorted.
- Non-UXO qualified personnel will not touch or disturb any object which could potentially be MEC related, and will immediately notify the nearest UXO-qualified person of the presence of the object.
- In order to protect other personnel and the general public, an EZ will be set up at a distance of at least 132 ft. This represents the HFD of the primary MGFD, which is a 40mm Mk2 projectile. A separation distance of at least 23 ft will be maintained between teams. This figure represents the K40 distance of the primary MGFD. Should a round with a greater fragmentation distance be encountered, these distances will be increased to the HFD and K40 distance of the contingency MGFD, which is the 90mm M71 projectile which has a HFD of 288 ft and a K40 distance of 50 ft. USA will have control of the entrance to the project area until the area has been cleared. Should personnel not associated with the project operations need to enter the EZ, the entry will be coordinated with the SUXOS and the personnel will be escorted at all times. All MEC operations will halt for the duration of time the person is within the EZ. Once they have departed the area, MEC operations may resume.

2.1.6 Chemical Hazards

The anticipated chemical hazards that would be expected during site activities include those fuels and oils brought on site for equipment use and maintenance, as well as potential ACM among construction debris on the site. All site personnel will follow the procedures and precautions outlined in the appropriate Material Safety Data Sheet (MSDS) for the use and storage of these materials. Recommended personal protective equipment (PPE) will also be worn and used by those individuals required to handle chemicals. The MSDS binder will be kept in the UXOSO site vehicle and will be available to all employees on request. Chemical warfare materiel is not expected to be found on this site. Should CWM be found on the site, USA will secure the site and withdraw to an upwind safe position at least 450 ft away, and contact the NAVFAC RPM for further direction.

2.1.7 Physical Hazards

2.1.7.1 Noise Hazards

Protection against the effects of noise exposure will be provided when the sound levels exceed those shown in Table 2-1 as measured on the A scale of a standard sound level meter at slow response. When employees are subjected to sound levels exceeding those listed in Table 2-1, feasible administrative or engineering controls will be utilized. If such controls fail to reduce sound to a safe level, PPE will be provided and used to reduce sound exceeding protective levels. If the variations in noise level involve maximal intervals of 1 second or less, it is to be considered continuous.

USA will make hearing protection available to all employees exposed to an 8-hour time-weighted average (TWA) of 85 dBA or greater. Hearing protection will be replaced as necessary. Hearing protection will be required for all personnel working in and around any operations likely to produce high noise levels, such as during the use of chain saws and weed-eaters used for vegetation clearance operations. Where required, sound pressure level measurements will be made by the UXOSO or other qualified personnel using calibrated instruments. Personnel required to use a sound level meter will be trained in its use and calibration requirements prior to use on site.

2.1.7.2 Heat Stress

See Subsection 9.14.1 of the APP.

2.1.7.3 Cold Stress

See Subsection 9.14.2 of the APP.

Table 2-1: Permissible Noise Exposures

Duration per Day (Hours)	Sound Level dBA (Slow Response)
8.00	90
6.00	92
4.00	95
3.00	97
2.00	100
1.50	102
1.00	105
0.50	110
0.25	115

NOTE: When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: C1./T1. + C2./T2. C(n)/T(n) exceeds unity, then, the mixed exposure should be considered to exceed the limit value. C(n) indicates the total time of exposure at a specified noise level, and T(n) indicates the total time of exposure permitted at that level. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

2.1.7.4 Vibration

Vibration can become a problem when using power tools. The use of chainsaws and other equipment in vegetation clearance operations can expose workers to vibration in the hands, which can lead to White Finger, which develops over time, and once developed cannot be cured. It is important to reduce exposure as much as possible in order to prevent White Finger or other vibration-related conditions from developing. At USA, the following precautions are taken when workers are required to use vibrating hand tools.

- Purchase sound, ergonomically designed equipment that reduces vibration transference to the hands.
- Use vibration-absorbing gloves.
- Encourage workers to hold equipment loosely.
- Work in short durations, with frequent breaks. Workers are encouraged to take at least one 10-minute break every hour.
- Keep hands warm in order to keep blood flowing.
- Avoid smoking, which inhibits blood flow.
- Avoid drugs that can inhibit blood flow.

Symptoms of vibration-related disorders include:

- Tingling and slight loss of feeling or numbness in the fingers
- Blanching or whitening of the fingers
- Blue skin that feels cold and numb
- Numb, prickly feeling or stinging pain, sometimes with redness upon warming or relief of stress
- Sequence of color changes in the skin from white to blue to red.

If workers begin to develop symptoms related to vibration exposure, report immediately to the UXOSO, who will ensure worker is examined/treated by a physician.

2.1.7.5 Excavations

See the APP, Subsection 9.25.

2.2 FLAMMABLE/EXPLOSIVE HAZARDS FROM FUELING EQUIPMENT AND SITE VEHICLES

The chance of fire and/or explosion during vehicle and equipment refueling and maintenance is high when improper procedures are used. All site vehicles will be equipped with a portable fire extinguisher readily available to fight a fire. Equipment will never be refueled on the back of a pick-up truck with a bed liner. Cellular phones will not be used around Flammable Liquids in accordance with Ordnance and Explosives Safety Group Safety Advisory 03-2003. Grounding and bonding procedures will be used during all fueling operations. No smoking will be permitted within 50 ft of fueling operations, and flammable and combustible materials will be removed from the vicinity of fueling operations.

2.3 IONIZING RADIATION

Ionizing radiation is not expected to be an issue on this project site.

2.4 BIOLOGICAL HAZARDS

Biological hazards that are usually found on site include hazardous plants, bees, spiders, ticks, and mosquitoes. Employee awareness and the safe work practices outlined in the following paragraphs should reduce the risk associated with these hazards.

2.4.1 Bees, Hornets and Wasps

Contact with stinging insects like bees, hornets, and wasps may result in site personnel experiencing adverse health effects that range from being mildly uncomfortable to being life threatening. Therefore, stinging insects present a serious hazard to site personnel, and extreme caution must be exercised whenever site and weather conditions increase the risk of encountering stinging insects. Some of the factors related to stinging insects that increase the degree of risk associated with accidental contact are as follows.

- The nests for these insects are frequently found in remote wooded or grassy areas.
- The nests can be situated in trees, rocks, and bushes or in the ground, and are usually difficult to see.
- Accidental contact with these insects is highly probable, especially during warm weather conditions when the insects are most active.
- If a site worker accidentally disturbs a nest, the worker may be inflicted with multiple stings, causing extreme pain and swelling which can leave the worker incapacitated and in need of medical attention.
- Some people are hypersensitive to the toxins injected by a sting, and when stung, these indivudals experience a violent and immediate allergic reaction resulting in a life-threatening condition known as anaphylactic shock.

- Anaphylactic shock manifests itself very rapidly and is characterized by extreme swelling of the body, eyes, face, mouth, and respiratory passages.
- The hypersensitivity needed to cause anaphylactic shock can, in some people, accumulate over time and exposure; therefore, even if someone has been stung previously and has not experienced an allergic reaction, there is no guarantee that they will not have an allergic reaction if they are stung again.

With these things in mind, and with the high probability of contact with stinging insects, all site personnel will comply with the following safe work practices.

- If a worker knows that he is hypersensitive to bee, wasp, or hornet stings, he must inform the UXOSO of this condition prior to participation in site activities.
- All site personnel will be watchful for the presence of stinging insects and their nests, and will advise the UXOSO if a stinging insect nest is located or suspected in the area.
- Any nests located on site will be flagged off and site personnel will be notified of its presence.
- If stung, site personnel will immediately report to the UXOSO to obtain first aid treatment and to allow the UXOSO to observe them for signs of allergic reaction. If a breathing emergency (anaphylactic shock) occurs as a result of the sting, immediately call 911.
- Site personnel with a known hypersensitivity to stinging insects will keep required emergency medication on or near their person at all times, and will let the UXOSO and co-workers know where it is kept and how to administer it.

2.4.2 Mosquitoes

Mosquitoes (see photo shown in Figure 2-1) are responsible for transmitting diseases such as malaria and West Nile virus through bites to the skin. While malaria is much more contagious, it is not normally found in North America. West Nile virus is commonly found in Africa, West Asia and the Middle East. In recent years, West Nile virus has been increasingly found in the continental United States. It is believed to have first appeared in the United States in 1999. It is most common in late summer or early fall, which is the active season for mosquitoes, but in warmer southern climates where the temperatures are milder, West Nile virus can be transmitted year round.

Figure 2-1: Mosquito

2.4.2.1 Transmission Cycle

Mosquitoes become infected with the virus when they feed on infected birds, which may circulate the virus in their blood for a few days. Infected mosquitoes can then transmit the virus to humans and animals while biting to take blood. The virus is located in the mosquito's salivary glands, and may be injected into the animal or human, where it can multiply, possibly causing illness. Even in areas where the virus is circulating, few mosquitoes are infected with the West Nile virus. Even if the mosquito is infected, less than 1% of people who get bitten and become infected will get seriously ill. The majority of cases of West Nile virus have been identified in birds, it has also been found in horses, cats, bats, chipmunks, skunks, squirrels, and domestic rabbits. Once West Nile virus has been contracted, the

survivor of this illness is believed to carry a lifelong immunity to it. At this time there is no vaccine against West Nile virus.

2.4.2.2 Symptoms

West Nile virus is an encephalitis, which causes an inflammation of the brain. Following transmission by an infected mosquito, West Nile virus multiplies in the person's blood system and crosses the blood-brain barrier to reach the brain. The virus interferes with normal central nervous system functioning and causes inflammation of the brain tissue. Fatality rates range from 3% to 15% of persons who develop severe illness, and rates are highest among persons over 50 years of age and those with weakened immune systems. This disease is not transmitted from person to person, so touching or working in the vicinity of someone with the disease will not increase the risk.

The incubation period for West Nile virus is normally 3 to 15 days. Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death. If symptoms develop, seek medical attention immediately.

2.4.2.3 Protective Measures

Prevention and control of West Nile virus is most effectively accomplished through vector management programs. Be alert for dead animals on the site, particularly birds. If a dead bird or other animal is found on site, bare-handed contact should be avoided. Using gloves or double plastic bags, wrap animal and call the Health Department. If the Health Department wants to test the bird, they will come and pick it up. If they are not testing the bird, it should remain wrapped in the plastic and disposed of in accordance with established procedures.

Other ways of reducing risk of becoming infected with West Nile virus include:

- Implementing mosquito control measures on the site
- Making sure that there are no open containers of standing water on the site in which mosquitoes can breed
- Wearing long sleeved shirts and long pants while outdoors
- Staying indoors at dawn, dusk, and in the early evening when mosquitoes are most active
- Spraying clothing with repellants containing permethrin or DEET
- Applying insect repellant sparingly to exposed skin. An effective repellant will contain 35% DEET. Higher concentrations of DEET provide no additional protection. Always read the manufacturer's directions on the repellant prior to applying it to the skin.
- Vitamin B and "ultrasonic" devices are NOT considered to be an effective deterrent to mosquito bites.

2.4.3 Spiders

A large variety of spiders may be encountered during site activities. While most spider bites merely cause localized pain, swelling, reddening and in some cases, tissue damage, there are a few spiders that, due to the severity of the physiological effects caused by their venom, are dangerous. These species include the black widow and the brown recluse or violin spiders (as shown in Figure 2-2 and Figure 2-3).

Figure 2-2: Black Widow Spider

Figure 2-3: Recluse Spider

The black widow is a coal-black bulbous spider about ¾-inch in length, with a bright red hourglass on the underside of the abdomen (see Figure 2-2). The black widow is usually found in dark moist locations, especially under rocks and rotting logs, and may even be found in outdoor toilets where they inhabit the underside of the seat. Victims of a black widow bite may exhibit the following signs or symptoms:

- Sensation of pinprick or minor burning at the time of the bite
- Appearance of small punctures (but sometimes none are visible)
- After 15 to 60 minutes, intense pain is felt at the site of the bite, which spreads quickly, and is followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils, and generalized swelling of face and extremities.

The brown recluse or violin spider is brownish to tan in color, rather flat, about 5/8-in. long with a dark brown "violin" shape on the top (see Figure 2-3). Of the brown spider, there are three varieties found in the United States, which present a problem to site personnel. These are the brown recluse, the desert violin, and the Arizona violin. These spiders may be found in a variety of locations including trees, rocks or dark locations. Victims of a brown or violin spider bite may exhibit the following signs or symptoms:

- Blistering at the site of the bite, followed by a local burning at the site 30 to 60 minutes after the bite
- Formation of a large, red, swollen, pustulating lesion with a bull's-eye appearance
- Systemic effects that may include a generalized rash, joint pain, chills, fever, nausea and vomiting
- Pain that may become severe after 8 hours, with the onset of tissue necrosis.

There is no effective first aid treatment for either of these bites. Except for very young, very old or weak victims, these spider bites are not considered to be life threatening; however, medical treatment must be sought to reduce the extent of damage caused by the injected toxins. If either of these spiders are suspected or known to be on site, the UXOSO will brief site personnel as to the identification and avoidance of the spiders. As with stinging insects, site personnel will report to the UXOSO if they locate either of these spiders on site or notice any type of bite while involved in site activities.

2.4.4 Ticks

2.4.4.1 General Information

The Centers for Disease Control (CDC) have noted the increase of Lyme disease and Rocky Mountain Spotted Fever (RMSF), which are caused by bites from infected ticks (see Figure 2-4) that live in and near wooded areas, tall grass, and brush. Ticks are small, ranging from the size of a comma up to about one quarter inch. They are sometimes difficult to see. The tick season extends from spring through summer. When embedded in the skin, they may look like a freckle.

Figure 2-4: Tick

Lyme disease has occurred in 43 states, with the heaviest concentrations in the Northeast (Connecticut, Massachusetts, New Jersey, New York, Pennsylvania), the upper Midwest (Minnesota and Wisconsin), and along the northern California coast. It is caused by deer ticks and the lone star ticks which have become infected with spirochetes. Female deer ticks are about one quarter inch in size, and are black and brick red in color. Male deer ticks are smaller, and completely black. Lone star ticks are larger and chestnut brown in color.

RMSF has occurred in 36 states, with the heaviest concentrations in Oklahoma, North Carolina, South Carolina, and Virginia. It is caused by Rocky Mountain wood ticks, and dog ticks which have become infected with rickettsia. Both are black in color.

The first symptoms of either disease are flu like chills, fever, headache, dizziness, fatigue, stiff neck, and bone pain. If immediately treated by a physician, most individuals recover fully in a short period of time. If not treated, more serious symptoms can occur.

If you believe you have been bitten by a tick, or if any of the signs and symptoms noted above appear, contact the UXOSO, who will authorize you to visit a physician for an examination and possible treatment..

2.4.4.2 Protective Measures

Standard field gear (work boots, socks and light-colored coveralls) provide good protection against tick bites, particularly if the joints are taped. However, even when wearing field gear, the following precautions will be taken when working in areas that might be infested with ticks.

- When in the field, check yourself often for ticks, particularly on your lower legs and areas covered with hair.
- Spray outer clothing, particularly your pant legs and socks, **BUT NOT YOUR SKIN**, with an insect repellant that contains permethrin or permanone.
- When walking in wooded areas, wear a hard hat, and avoid contact with bushes, tall grass, or brush as much as possible.
- If you find a tick, remove it by pulling on it gently with tweezers.
- If the tick resists, cover the tick with salad oil for about 15 minutes to asphyxiate it, then remove it with tweezers.
- **DO NOT** use matches, a lit cigarette, nail polish or any other type of chemical to "coax" the tick out.
- Be sure to remove all parts of the tick's body, and disinfect the area with alcohol or a similar antiseptic after removal.
- For several days to several weeks after removal of the tick, look for the signs of the onset of Lyme disease, such as a rash that looks like a bulls-eye or an expanding red circle surrounding a light area, frequently seen with a small welt in the center.

- Also look for the signs of the onset of RMSF, such as an inflammation which is visible in the form of a rash comprising many red spots under the skin, which appears 3 to 10 days after the tick bite.

2.4.5 Hantavirus Pulmonary Syndrome (HPS)

Some rodents are infected with a type of hantavirus that causes HPS. Common house mice do not carry hantavirus. In the United States, deer mice (plus cotton rats, shown in Figure 2-5 and the white-footed mouse in the Northeast) are the rodents carrying hantaviruses that cause hantavirus pulmonary syndrome (HPS).

These rodents shed the virus in their urine, droppings and saliva. The virus is mainly transmitted to people when they breathe in air contaminated with the virus. This happens when fresh rodent urine, droppings or nesting materials are stirred up. When tiny droplets containing the virus get into the air, this process is known as aerosolization. There are several other ways rodents may spread hantavirus to people.

- If a rodent with the virus bites them, the virus may be spread this way – but this is very rare.
- Researchers believe that you may be able to get the virus if you touched something that had been contaminated with rodent urine, droppings, or saliva, and then touched your nose or mouth.
- Researchers also suspect that if virus-infected rodent urine, droppings, or saliva contaminates food that you eat, you could also become sick.

Figure 2-5: Cotton Rat

2.4.5.1 Symptoms of HPS

Early symptoms include fatigue, fever, and muscle aches, especially the large muscle groups – thighs, hips, back, and sometimes shoulders. These symptoms are universal. There may also be headaches, dizziness, chills and/or abdominal problems, such as nausea, vomiting, diarrhea and abdominal pain. About half of all HPS patients experience these symptoms.

Per the CDC, HPS patients experience a short febrile prodrome lasting 3 to 5 days where patients exhibit fever, myalgias, headache, chills, dizziness, non-productive cough, nausea, vomiting and other gastrointestinal symptoms. Some patients also report arthralgias, back pain, abdominal pain and shortness of breath. On approximately day 7 cough and tachypnea occur. Once the cardiopulmonary phase starts, the disease progresses rapidly, necessitating hospitalization and often ventilation within 24 hours. MINIMIZE RISK – do not disturb rodents, burrows, or dens.

2.4.5.2 Preventive Measures

If there are signs of a rodent nest or rodent droppings, make it known to the UXOSO. To clean and disinfect the area, spray a disinfectant on the area and leave a waiting time of 20 minutes. Then clean it up using rubber or plastic gloves, coveralls, rubber boots or disposable shoe covers, protective goggles, and a half-face mask air-purifying respirator with a high-efficiency particulate air (HEPA) filter. Bag the cleaning materials and dispose of it. Then, re-clean the area with disinfectant.

2.4.6 Mites (Chiggers)

As shown in Figure 2-6, chiggers are small mites that are usually a yellowish to bright red color. Chiggers may live year-round but are especially active during spring and summer. The larval chigger is the active stage that bites animals and humans, attaching themselves tightly. After secreting digestive enzymes that break down the skin cells, the mite feeds on the liquefied cells. The rash and intense itching associated with chiggers is an allergic reaction to the mite's

Figure 2-6: Magnified View of a Mite

salivary secretions. Preventive measures used against mosquitoes are effective against chiggers. Treatments to ease itching include ointments such as calamine lotion, hydrocortisone, and benzocaine.

2.4.7 Hazardous Plants

During the conduct of site activities the number and variety of hazardous plants that may be encountered is large and extensive. However the plants that present the greatest degree of risk to site personnel (i.e., potential for contact vs. effect produced) are those that produce skin reactions and skin and tissue injury.

2.4.7.1 Plants Causing Skin and Tissue Injury

Contact with splinters, thorns and sharp leaf edges is of special concern to site personnel, as is the contact with the pointed surfaces found on branches, limbs and small trunks left by site clearing and grubbing crews. This concern stems from the fact that punctures, cuts, and even minor scrapes caused by accidental contact may result in non-infectious skin lesions, and the introduction of fungi or bacteria through the skin or eye. This is especially important in light of the fact that the warm, moist environment created inside impermeable protective clothing is ideal for the propagation of fungal and bacterial infection. Personnel receiving any of the injuries listed above, even minor scrapes, will report immediately to the UXOSO for initial and continued observation and care of the injury.

2.4.7.2 Plants Causing Skin Reactions

The poisonous plants of greatest concern are poison ivy and poison sumac (Figure 2-7). Poison ivy can be found throughout the state, while poison sumac prefers wet, low-lying areas. Poison ivy thrives in all types of light and usually grows in the form of a trailing vine; however, it can also grow as a bush and can attain heights of 10 ft or more. Poison ivy has shiny, pointed leaves that grow in clusters of three. Poison sumac is a tall shrub or slender tree that usually grows along swampy areas or ponds, and in wooded areas. Each poison sumac leaf stalk has 7 to 13 leaflets, which have smooth edges.

Poison Ivy	Poison Sumac
	

Figure 2-7: Poisonous Plants

The skin reaction associated with contacting these plants is caused by the body's allergic reaction to toxins contained in oils produced by the plant. Becoming contaminated with the oils does not require contact with just the leaves. Contamination can be achieved through contact with other parts of the plant such as the branches, stems or berries, or contact with contaminated items such as tools and clothing. Being downwind from areas where these plants are burning can also produce reactions. The allergic reaction associated with exposure to these plants will generally cause the following signs and symptoms:

- Blistering at the site of contact, usually occurring within 12 to 48 hours after contact
- Reddening, swelling, itching and burning at the site of contact
- Pain, if the reaction is severe

- Conjunctivitis, asthma, and other allergic reactions if the person is extremely sensitive to the poisonous plant toxin.

If the rash is scratched, secondary infections can occur. The rash usually disappears in 1 to 2 weeks in cases of mild exposure and up to 3 weeks when exposure is severe. Preventive measures, which can prove effective for most site personnel, are:

- Avoid contact with any poisonous plants on site, and keep a steady watch to identify, report, and mark poisonous plants found on site
- Wash hands, face or other exposed areas at the beginning of each break period and at the end of each workday
- Avoid contact with, and wash on a daily basis, contaminated tools, equipment, and clothing
- Barrier creams, detoxification/wash solutions and orally administered desensitization may prove effective and should be tried to find the best preventive solution
- Keeping the skin covered as much as possible (e.g., wearing long pants and long-sleeved shirts) in areas where these plants are known to exist will limit much of the potential exposure.

2.5 HAZARD MITIGATION

The hazards listed above will be addressed through a combination of training, engineering controls, and PPE.

- Implementation of Engineering Controls and Work Practices

Training in site procedures and the use of site equipment can prevent accidents from occurring. Training in recognition of MEC or MEC pieces that could be hazardous will be given to all site workers. When MEC or pieces of MEC are encountered, only UXO-qualified personnel will be able to identify and dispose of them. Other controls include the MSD of at least 23 ft, which will provide protection of individual teams from nearby site operations, and the fragmentation distance surrounding the site footprint will protect the general public from the hazards of site operations.

- Upgrades/Downgrades in Levels of Personal Protective Equipment

Due to the types of hazards at this site, Level D PPE will be required. This type of PPE is used for levels of contamination that may present a nuisance, but not an identifiable hazard. Level D PPE consists of a hard hat, leg chaps, face shield, safety glasses or goggles, hearing protection, leather or canvas work gloves, and leather work boots with ankle support and non-slip soles. The hard hat, leg chaps, hearing protection and face shield will be worn in the vicinity of vegetation clearance operations, and in these operations, safety-toe footwear will be required. If site hazards are encountered that require additional PPE, the PPE level can be increased by the UXOSO in consultation with the CHSM, who would base the decision on documented evidence of the hazards. If the site is not as hazardous as originally anticipated, the level of PPE can be downgraded by the CHSM. This decision would also be based on definitive data that confirms the PPE can be lessened. Normally, downgrading of PPE would require at least one week's worth of data demonstrating that the site is not as hazardous as originally suspected.

- Work Stoppage

All personnel are trained to be constantly aware of their work environment. Anyone has the ability to stop operations for safety reasons. No worker is expected to perform any operation for which he has not been properly trained, or to perform any operation that is considered to be unsafe. After operations are stopped for safety reasons, the UXOSO will be notified and will evaluate the situation. The UXOSO will, in consultation with the CHSM, determine what steps need to be taken to make the situation safe for operations to continue. The RPM will be informed of the work stoppage, reason for the stoppage, and impending actions immediately. The RPM will also be informed when work has resumed.

- Emergency Evacuation

In the event of an emergency that requires evacuation of the site, an alarm will be sounded via radio, telephone, or verbal instruction by the UXOSO to evacuate the area. Personnel will exit the area to the

pre-designated assembly point. After evacuation, the UXOSO will account for all personnel, ascertain information about the emergency and advise responding on-site personnel. The UXOSO will contact, advise, and coordinate with responding off-site emergency personnel if deemed necessary by the situation.

In all situations that require evacuation, personnel will not re-enter the work area until:

- The conditions causing the emergency have been corrected
- The hazard has been reassessed
- The Site Specific Health and Safety Plan has been revised and reviewed with on-site personnel, if needed
- Instructions have been given for authorized re-entry by the UXOSO.

- Prevention and/or Minimization of Public Exposure to Hazards Created by Site Activities

The creation of an EZ between the site footprint and the general public acts as a safety buffer to protect the public from site hazards. Controlling access to the site, closing roads, and installing signs and barricades are all means of keeping the general public from accidentally wandering into the site during operations. In addition, the training of all site workers in the hazards and recognition of MEC will reduce the potential for public exposure to hazards. If unauthorized personnel are observed in the EZ, all MEC operations will cease until the area is cleared of unauthorized personnel.

3.0 STAFF ORGANIZATION, QUALIFICATIONS AND RESPONSIBILITIES

See Section 4.0 of the Accident Prevention Plan (APP).

4.0 TRAINING

See Section 6.0 of the APP.

5.0 PERSONAL PROTECTIVE EQUIPMENT

When feasible, engineering controls and work practices, or a combination thereof, will be utilized to protect site workers from safety and health hazards and to maintain personal exposures to hazardous substances below established exposure limits. The exposure limits used by USA will be the lower of the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs) found in 29 Code of Federal Regulations (CFR) 1910 Subpart G and 29 CFR 1910.1000, or the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs). Other recognized published exposure levels, such as those found on MSDSs, will be used if the substance is not listed by OSHA or the ACGIH. USA will not utilize a system of employee rotation as a means of complying with the PPE, PEL, TLV or other published limits.

5.1 TYPES OF PPE

Requirements for task and activity-specific levels of protective clothing are presented on the AHAs located in Attachment 2 of the APP. Personnel performing site tasks will use the appropriate level and type of PPE specified in this plan for each individual task. This SHSP makes provisions for use of the following levels of PPE, in accordance with the hazards and contamination level anticipated for each task or operation: Level A, Level B, Level C, and Level D. The following sections describe the PPE requirements for activities and locations on the site.

5.1.1 Level A Protection

Level A Protection is not required.

5.1.2 Level B Protection

Level B Protection is not required.

5.1.3 Level C Protection

Level C Protection may be required during sampling of potential ACM. The following Level C PPE will be used, if required, for this operation by Parsons personnel:

- Tyvek or similar coveralls with hood
- Leather or canvas work gloves
- Leather safety-toe work boots with ankle support and non-slip soles
- Boot covers
- Safety glasses with side shields or safety goggles
- Full face or half face air purifying respirator with HEPA filters

5.1.4 Level D Protection

The minimal level of protection that will be required of USA personnel and visitors at the site will be Level D. The UXOSO may increase the level of protection due to changing requirements but may not decrease the level of protection without approval of corporate safety management. The following equipment will be used for Level D protection:

- Hard hat, in the vicinity of vegetation clearance operations
- Face shield, in the vicinity of vegetation clearance operations
- Leather or canvas work gloves
- Safety glasses with side shields or safety goggles
- Hearing protection, where required by high noise levels, in the vicinity of vegetation clearance operations or MEC disposal operations
- Leather work boots with ankle support and non-slip soles, safety-toe is required in the vicinity of vegetation clearance operations. Steel-toe footwear may not be worn in the vicinity of magnetometer operations, in which case composite toe footwear would be used.
- Cotton work clothes or coveralls
- Back supports (optional)
- Leg chaps – when working with vegetation removal equipment
- Personal floatation device – when participating in waterborne operations.

5.1.5 Eye Protection

All personnel will use appropriate eye protection when exposed to eye hazards from flying particles, liquid chemicals, or other eye hazards. All personnel will use eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g., clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.

- All personnel who wear prescription lenses while engaged in operations that involve eye hazards will wear eye protection that incorporates the prescription in its design, or wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.
- Eye protection will be distinctly marked to facilitate identification of the manufacturer.

5.1.6 Head Protection

When working in the vicinity of vegetation clearance operations, hard hats will be worn.

5.1.7 Leg Protection

Leg chaps will be worn by equipment operators during vegetation clearance operations.

5.1.8 Foot Protection

Due to the uneven working surfaces and potential for tripping hazards, all USA personnel will wear sturdy leather work boots with ankle support and non-slip soles. Personnel working in vegetation clearance and heavy equipment operations will wear safety toe work boots. Personnel using magnetometers for the detection of buried MEC will not wear steel-toe safety shoes, as these will affect the readings of the equipment. Composite toe footwear is recommended in these operations.

5.1.9 Hand Protection

USA selects and requires employees to use appropriate hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; thermal burns; and harmful temperature extremes. For most operations on this site, leather or canvas work gloves will provide adequate protection against minor cuts, which are a hazard in most site operations. Chemical-resistant gloves will be required in fueling operations.

5.1.10 Hearing Protection

USA will make hearing protectors available to all employees exposed to an 8-hour TWA of 85 dB or greater. Hearing protectors will be replaced as necessary. Hearing protection will be required for all personnel working in and around any operations likely to produce high noise levels, such as during the use of chain saws and weed-eaters during vegetation clearance operations, heavy equipment operations, and MEC disposal operations.

5.2 PROPER PPE SELECTION

Each task outlined in the Statement of Work (SOW) has been assessed to determine the risk of personnel exposure to safety and health hazards that may be encountered during its conduct. The hazard assessment is based on available information pertaining to the historical use of the site, site contaminant characterization data, and the anticipated operational hazards. This information has been provided by the client, or collected by USA site personnel. The PPE assigned as a result of the hazard assessment represents the minimum PPE to be used during initial site activities. Since hazard/risk assessment is a continuing process, changes in the initial types and levels of PPE will be made in accordance with information obtained from the actual implementation of site operations and data derived from the site monitoring. As a general rule, the levels of PPE will need to be reassessed if any of the following occurs:

- Commencement of a new work phase, such as the start of drum sampling or work that begins on a different portion of the site
- Change in job tasks during a work phase
- Change of season/weather
- When temperature extremes or individual medical considerations limit the effectiveness of PPE
- Contaminants other than those previously identified are encountered
- Change in ambient levels of contaminants
- Change in work scope, which affects the degree of contact with contaminants.

During the selection of PPE, the CHSM and UXOSO will also take into consideration the following factors:

- Limitations of the equipment
- Work mission duration
- Temperature extremes
- Material flexibility
- Durability/integrity of the equipment.

5.3 UPGRADING/DOWNGRADING PPE

If work tasks are added or amended after completion and approval of the APP/SHSP, the UXOSO will conduct the task hazard assessment and consult with the CHSM. The level and type of PPE to be used will be identified. The UXOSO can increase the level of PPE when the situation warrants, due to an increase in hazardous exposure. Any decreases in the level of PPE must be approved by the CHSM, only after review of documentation demonstrating that the conditions and/or potential for hazardous exposure are reduced enough to justify the downgrade.

5.4 GENERAL REQUIREMENTS

All PPE will be provided, used, and maintained in a sanitary and reliable condition where it is necessary. PPE is required due to hazards of processes or environment, chemical hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact. All PPE will be used in the manner for which it was designed. The assignment of PPE will be based upon hazard analysis, and the equipment will be selected based on its protection factor against site hazards.

5.5 INSPECTIONS

Each piece of PPE will be inspected daily prior to use. Defective or damaged PPE will not be used. It will be removed from service and turned in for repair, or removed from the site for disposal and replaced with new PPE. During the work task, buddy teams should periodically inspect each other's PPE for evidence of chemical attack, such as discoloration, swelling, stiffening, or softening.

5.6 CLEANING AND DECONTAMINATION

The UXOSO will be responsible for ensuring that PPE is in good, clean, working order prior to issuing the PPE the first time. Once issued, site personnel will ensure that re-usable articles of PPE are maintained in a clean and sanitary fashion. For items used inside an EZ, site personnel will ensure that the PPE is properly decontaminated before removing the item from the EZ or Contamination Reduction Zone.

5.7 MAINTENANCE

Maintenance of PPE can vary greatly, based upon the complexity of the PPE and the intricacy of the repair involved. The UXOSO will become familiar with the manufacturer's recommended maintenance and when possible repair defective PPE. If unable or unauthorized to conduct the repair, the UXOSO will return the item to the manufacturer for repair, or procure a replacement.

5.8 STORAGE

PPE will be stored in a location, which is protected from the harmful effects of sunlight, damaging chemicals, moisture, extreme temperatures, impact, or crushing. If needed, the UXOSO will designate a specified area for the storage of PPE.

5.9 PPE PROGRAM EFFECTIVENESS

Based on the inhalation hazard and potential chemical exposures on this site, Level D PPE is considered adequate for the work that is to be accomplished at the site. If work tasks are added to the SOW after approval of the APP/SHSP, the SUXOS and/or UXOSO (as applicable) shall identify and assess the task hazards and relay that information to the CHSM. The CHSM will prepare an amendment to the APP and submit the amendment for approval from NAVFAC. The amendment will be added to the APP upon NAVFAC approval.

The UXOSO will ensure PPE use complies with all applicable OSHA and USA requirements. It is the responsibility of each employee to report to work wearing proper attire and to assemble the necessary PPE prior to initiating donning procedures.

5.10 TRAINING

USA will provide training to each employee who is required by this section to use PPE. Each affected employee will demonstrate an understanding of the training, and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE. Each such employee will be trained to know at least the following:

- The decisions and justifications used to select each piece of PPE
- The nature of the hazards and the consequences of not using PPE
- When PPE will be required during the performance of each task
- How to properly don, doff, adjust, and wear each piece of PPE
- The proper inspection, cleaning, decontaminating, maintenance, and storage of each PPE item used
- The limitations of the PPE.

All personnel receiving PPE training will be required to demonstrate an understanding of the training topics and the ability to correctly use the PPE. This will be accomplished through the UXOSO supervising and visually inspecting each individual's ability to properly don and use the PPE during initial use of the PPE.

When the UXOSO has reason to believe that any affected employee who has already been trained does not have the understanding and skill required he should retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:

- Changes in the workplace render previous training obsolete
- Changes in the types of PPE to be used render previous training obsolete
- Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.

Upon completion of the training and after each employee has successfully demonstrated the requisite understanding, the UXOSO will complete the Training Form (see Table 5-1). This form identifies the employees who attended the training course and successfully demonstrated the required knowledge; the date(s) of the training and demonstration session(s); and the PPE covered by the training session.

This space is intentionally left blank.

Table 5-1: USA Certification of PPE Training

SITE INFORMATION			
Site Name:			
Location:		Instructor(s):	
Date of Classroom Instruction:		Date of Demonstration:	
PPE TRAINING COURSE ATTENDANTS			
The following personnel have attended the site PPE training course, and demonstrated, through use, an understanding of the donning/doffing procedures, inspection, cleaning, maintenance, storage, limitations, and proper disposal of the PPE listed on this certificate. These personnel are now qualified to use the site- and task-specific PPE, as required by the APP/SHSP.			
Name	**Organization**	**Name**	**Organization**
TYPES AND LEVELS OF PPE ADDRESSED DURING TRAINING			
Trainer's Initials	**Personal Protective Equipment Reviewed**	**Trainer's Initials**	**Personal Protective Equipment Reviewed**
CERTIFICATION			
I the undersigned do hereby certify that the above listed personnel have received the requisite training and successfully demonstrated their ability to use the PPE listed above, in accordance with the USA Personal Protective Equipment Program.			
Name (printed):	Signature:	Date:	

6.0 MEDICAL SURVEILLANCE

Medical surveillance of USA employees will be conducted in accordance with the requirements of the OSHA 29 CFR 1910.120(f), 29 CFR 1910.134(b)(10) and other established guidelines. Personnel to be included in the Medical Surveillance Program will be those who perform hazardous waste operations that may potentially expose the worker to hazardous substances or other significant safety and health threats. All USA personnel on the project site will participate in the USA Medical Surveillance Program. Visitors desiring entry into the EZ must participate in their employer's Medical Surveillance Program and must have a current physician's statement prior to entry.

6.1 BASELINE HEALTH ASSESSMENT PHYSICAL OR ANNUAL PHYSICAL

A baseline health assessment physical or annual physical will be conducted prior to participating in site operations, to determine the worker's ability to perform hazardous waste operations in a safe and healthful manner. The Project Manager, in conjunction with the CHSM, will ensure that all health assessments address the site specific health hazards to which workers may be exposed.

Physicals will be scheduled through the Human Resources department of USA, who will contract the services of a board certified occupational medicine physician in the vicinity of the employee's home or job site. The designated physician will perform the medical assessments and review medical examination results to determine each worker's ability to perform his assigned hazardous waste duties. The physician will also be responsible for determining if supplemental or follow-up examinations are required, and for maintaining medical and exposure records in accordance with OSHA 29 CFR 1910.120(d).

The purpose of the Medical Surveillance Program is to:

- Assess the individual's health status prior to participation in hazardous waste operations
- Determine the individual's ability to perform work assignments that require the use of PPE
- Establish baseline data for comparison to future medical data in order to provide a means of monitoring a worker's health status
- Establish facilities and procedures for emergency and non-emergency medical treatment
- Establish procedures for maintenance and storage of medical and exposure records.

The USA medical surveillance program examination consists of:

- Medical and occupational history questionnaire, which includes information on past gastrointestinal, hematological, renal, cardiovascular, reproductive, immunological, and neuralgic problems
- Information and history of respiratory disease and personal smoking habits
- Physical examination
- Blood pressure measurements
- Complete blood count and differential to include hemoglobin and hematocrit determinations, red cell indices, and smear of peripheral morphology
- Blood urea nitrogen and serum creatinine
- SMAC 24
- Chest x-ray
- Pulmonary function test
- Audiogram
- Echocardiogram for employees over 45 years old, or when other complications indicate the necessity
- Drug (HR Panel 10) and alcohol screening
- Visual acuity.

The following information is provided to the examining physician:

- Description of the employee's duties
- Anticipated hazardous exposure and levels (to include such things as heat stress, cold stress, vibration, noise, biological hazards, respiratory hazards, chemical hazards, confined spaces, etc.)
- Description of the PPE commonly used
- Information from previous medical exams.

The medical surveillance provided to the employees includes a judgment by the medical examiner of the ability of the employee to use either positive or negative pressure respiratory equipment in accordance with 29 CFR 1910.134. Any employee found to have a medical condition that could directly or indirectly be aggravated by exposure to chemical substances or by the use of respiratory equipment will not be employed for any project requiring clearance under the Respiratory Protection Program. A copy of the medical examination is provided at the employee's request.

The employee will be informed of any medical conditions that would result in work restriction or that would prevent them from working at hazardous waste sites.

6.1.1 Physician's Statement

The results of this examination will be made available to the employee and a written physician's statement will be sent to USA. A copy of the physician's statement will be kept in each employee's file at the project site for the duration of site operations. The physician's statement will include the following:

- The physician's opinion regarding any conditions that would place the employee at an increased risk from working in hazardous waste operations
- The physician's recommended limitations upon the employee's assigned work, if any
- A statement that the employee has been informed by the physician of the results of the examination, and any conditions that may require further examination or treatment.

6.1.2 Supplemental Examination

Any site worker who has: been injured; received health impairment; developed signs or symptoms from possible over-exposure; or received a documented over-exposure without the use of respiratory protection, will undergo a supplemental examination. The contents of this examination will be based upon the type of injury, illness, signs or symptoms of exposure involved and will be determined by the physician. Prior to reassignment to site activities, the physician will certify that the employee is fit to return to work. If necessary, the physician will specify in writing any activity restrictions or additional tests that may be required.

6.1.3 Follow-up Health Assessments

If, during any pre-assignment, annual or supplemental examination, a condition is detected that requires follow-up tests, the physician will notify USA and the employee as to the nature of the follow-up health assessment. The physician will determine the schedule and content of the follow-up health assessment. A statement outlining the employee's fitness for work will be provided to USA and the employee upon conclusion of the follow-up health assessment.

6.1.4 Emergency and Non-emergency Medical Treatment

USA will have a minimum of two site workers certified in First Aid/Cardiopulmonary Resuscitation (CPR). These workers will act as the first responders on site in the event of an accident or injury. They will provide emergency first aid services until professional medical personnel arrive on site to take over the treatment. The First Responders will take care of all first aid and non-serious injuries to site personnel and will inform the UXOSO when such injuries occur. For serious injuries, the medical treatment facility for use at this project site will be Mid Coast Hospital, 123 Medical Center Drive, Brunswick, ME 04011.

For non-serious medical services, the occupational health clinic for this project will be US Health Works Medical Group, 11 Medical Center Drive, Brunswick, ME 04011. For a map and directions to Mid Coast Hospital and US Health Works Medical Group, please refer to the Attachment provided at the end of this SHSP.

6.1.5 Medical Restriction

Should an occupational injury or illness occur that restricts an employee's ability to function at full capacity, USA maintains a policy of providing these employees with restricted duty assignments whenever possible to allow them to continue to be productive.

6.1.6 Record Keeping

USA will retain and maintain copies of all physician statements, exposure records, and associated information for USA employees involved in hazardous waste operations, in accordance with the requirements of 29 CFR 1910.120(f). These records will be kept at the project site for the duration of site operations. When the site work is complete, the records will be retained by USA at the Corporate Office located in Oldsmar, FL. Examining physicians will be responsible for maintaining records related to laboratory analyses and other tests for each USA employee examined. All records, whether maintained by USA or by the examining physician, will be kept on file for a period of 30 years beyond an employee's termination.

7.0 EXPOSURE MONITORING AND SAMPLING PLANS

There will be limited monitoring for hazardous exposures on this site. While personnel performing vegetation removal operations will be provided with hearing protection, noise monitoring may also be conducted. If the noise exposure level can be consistently demonstrated to be below the action level for noise, (i.e., at least one week of readings below 85 dBA) the CHSM may decide to reduce this requirement based on monitoring results. See Section 2.1.7.1 of this SHSP for additional information. Workers on this site will normally be in Level D PPE; however, heat stress monitoring will be required if the temperature goes above 75 °F. Should heat stress monitoring be required, site monitoring data will be recorded using the Site Monitoring Log and will be maintained as part of the project record. Should sampling be required for potential ACM, Parsons will monitor their field sampling crew for asbestos during the sampling task.

7.1 HEAT STRESS MONITORING

Heat stress monitoring will be conducted using temperature readings, obtained from an on-site Wet Bulb Globe Temperature (WBGT), in order to assure adequate work/rest cycles are determined and implemented at the site. When the temperature approaches 75 °F or above, heat stress monitoring is required. Monitoring will be performed by the UXOSO and results will be documented. The WBGT readings may also be supplemented by pulse rate monitoring, at the discretion of the UXOSO, if he feels it is necessary to assure all site personnel are adequately acclimatized to the site conditions. All site monitoring records for heat stress will be maintained on site for the duration of site operations, after which they will become part of the official project files. Plenty of cold drinking water will be available on site to maintain hydration of site personnel. See Section 9.14.1 of the APP for additional information.

7.2 METEOROLOGICAL MONITORING

Rain can constitute a safety hazard to field operations at this site. This site may also experience snowstorms and icy conditions. The UXOSO will be responsible for monitoring the weather closely. If the area becomes icy, wet, muddy, windy, deep with snow or slippery such that an unacceptable level of risk exists for personnel who are working in proximity to MEC items, then site operations will cease until the UXOSO determines the area is safe to continue.

No site operations will take place if an electrical storm is within 10 miles of the site. An electrical storm monitor, set to the proper distance, will be used to determine if an electrical storm is approaching. Site operations will cease when an electrical storm is within 10 miles of the site, and will not resume again

until the UXOSO determines that the electrical storm is at least 10 miles away from the site. Personnel will evacuate the site to the pre-designated evacuation point and will await the determination by the UXOSO that it is safe to resume operations.

If a snowstorm is approaching, the UXOSO will monitor local weather forecasts regarding the strength of the storm and anticipated accumulations of snow. The UXOSO will also monitor conditions on the ground in order to determine at what point to shut the operation down. If snow or icy conditions will require local road closures, the UXOSO will close the site operations and send personnel back to their lodging for shelter until the storm passes and roads are opened. If roads are closed by local authorities, site vehicles may not be used. In these cases, there is a serious risk of an accident, and if an accident occurs vehicle insurance will not cover damages. When the road closure is lifted, the UXOSO may determine when it is safe to resume operations, based on conditions at the site.

7.3 PERIMETER MONITORING

No perimeter monitoring is required.

8.0 SAFETY AND OCCUPATIONAL HEALTH PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

Using common sense and following safe practices can reduce hazards. Personnel must keep the prudent guidelines listed below in mind when conducting field activities.

- Hazard assessment is a continuous process. Personnel must be aware of their surroundings and constantly be aware of MEC, chemical and physical hazards that are or may be present.
- The number of personnel in the EZ will be the minimum number necessary to perform work tasks in a safe and efficient manner.
- Team members will be familiar with the physical characteristics of each site including wind direction, site access, and the location of communication devices and safety/emergency equipment.
- Detection or appearance of unusual or unknown liquids, odors or discolored soil could indicate the presence of contaminants and should be reported to the UXOSO immediately.
- Site personnel are to report any other unusual or potentially hazardous condition to the UXOSO for investigation and/or corrective action.

8.1 SITE RULES/PROHIBITIONS

All personnel on site will be required to follow the safe work practices contained in this Plan, as they relate to the hazards encountered during site activities. All site personnel will be required to read, understand, and comply with the provisions of this SHSP. If new tasks or hazards are identified during site operations, which pose additional hazards, the SHSP will be amended by the CHSM, to include additional safe work practices and other control methods as needed.

8.1.1 Buddy System

The buddy system is a safety practice in which each individual is concerned with the health and well being of co-workers. The buddy system will be implemented during all on-site activities and will be incorporated when workers may be isolated or as determined by the UXOSO. The UXOSO will assign “buddies” to ensure accounting of all site personnel. Additional procedures include:

- A minimum of two personnel, with one being a UXO-qualified person, will be present during all MEC operations to ensure that one person will always act as a safety observer. During all MEC operations, only the minimum number of personnel required to safely perform the task will be allowed on site. All other personnel will evacuate to a pre-designated assembly point.
- At no time will an individual desert his “buddy” unless his “buddy” goes down, and it is considered too hazardous to render assistance. “Buddies” will enter and exit the EZ together and frequently

monitor one another for signs of fatigue, heat stress, and any other problems. In such cases, the worker in danger may not be aware he/she is having a problem. The "buddy" must always be alert to changes in the behavior of his "buddy" so that he can remove him/her from the situation immediately.

- "Buddies" should frequently inspect each other's equipment, including PPE, to ensure that it is adequate and in proper working order.

8.1.2 Eating/Drinking/Smoking Restrictions

Hand and face washing facilities will be set up in the Support Zone (SZ) and will be utilized by all personnel exiting the EZ prior to eating, drinking, tobacco use, or other hand-to-face activities. Paper towels will be provided for drying. A trash receptacle will be provided for discarded paper towels. Eating, drinking and tobacco use will take place in the SZ.

Smoking will be permitted only in designated areas. These areas will be equipped with a fire extinguisher, as well as a can containing sand, where cigarette butts can be safety discarded without concern for the spread of fire. All lighters and matches will remain in the designated smoking area and will not be permitted into the site.

8.1.3 Safe Practices

Safe practices can reduce hazards associated with normal site activities. Personnel must keep the prudent guidelines listed below in mind when conducting field activities. The following general personnel requirements apply.

- Horseplay or fighting is prohibited.
- Eating, drinking, smoking, chewing gum, tobacco, or any other hand-to-face activities are prohibited on site, except in designated areas after both face and hands have been washed.
- When required to sit or kneel on the ground, avoid contaminated surfaces.
- Placing equipment on contaminated surfaces should be avoided.
- Climbing on or over obstacles is prohibited. Stacks of materials can be unstable and could cause injury.
- Open flames of any type are prohibited on site.
- Bringing defective or unsafe equipment on site is prohibited.

Only authorized employees may enter the work site. Visitors must check in with the UXOSO, receive an appropriate safety briefing, and be escorted by UXO-qualified personnel at all times while on site.

8.2 WORK PERMIT REQUIREMENTS

8.2.1 Radioactive Work

As there are no plans to perform work involving radioactive materials, work permits for this type of work will not be required.

8.2.2 Excavation Work

Due to the depth of excavations anticipated at this site, excavation permits will not be required for this project.

8.2.3 Hot Work

As there are no plans for welding operations on this site, there will be no requirement for hot work permits.

8.2.4 Confined Space

As there are no plans for confined space work on this site, confined space permits will not be required.

8.3 MATERIAL LIFTING AND HANDLING PROCEDURES

Many types of objects are handled in normal day-to-day operations. Care will be taken and training will be provided to all personnel for lifting and handling heavy or bulky items, as this is the cause of many joint and back injuries. The following fundamentals address the proper lifting of materials to avoid joint and back injuries.

- The size, shape, and weight of the object to be lifted must be considered. Site personnel will not lift more than they can handle comfortably.
- A firm grip on the object is essential; therefore, the hands and object will be free of oil, grease, and water, which might prevent a firm grip.
- The hands, and especially the fingers, will be kept away from any points that may cause them to be pinched or crushed, especially when setting the object down.
- The item will be inspected for metal slivers, jagged edges, burrs, rough or slippery surfaces, and pinch points, and heavy gloves will be used, if necessary, to protect the hands.
- The feet will be placed far enough apart for good balance and stability.
- Personnel will ensure that solid footing is available prior to lifting the object.
- When lifting, get as close to the load as possible and bend the legs at the knees, making sure that the back is kept as straight as possible.
- To lift the object, the legs are straightened from their bending position.
- 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, with the back kept straight, the legs bent at the knees, and the object lowered.
- If the item to be lifted is too large, bulky, or heavy (over 50 lb) for one person to safely lift, ask a co-worker for assistance. If a piece of material handling equipment is available that can do the job, the employee should use the equipment instead of trying to lift the object himself/herself.
- When two or more people are required to handle an 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 person, if possible, will face the direction in which the object is being carried.
- Ensure the pathway that will be taken while carrying the object is known by all personnel; is as level as possible; and is free of any slip, trip, and fall hazards.

8.3.1 Soil Handling Procedures

Workers are not expected to be handling chemically contaminated soil.

8.3.2 Liquid Handling Procedures

If workers will be required to handle liquid chemical materials, appropriate PPE will be used based on the specific type of chemical(s) to which they may be exposed. All flammable liquids will be stored in approved flammable liquid containers and stored in designated flammable liquid storage areas. Grounding and bonding procedures will be used when dispensing flammable liquids from one container to another or into equipment. No equipment will be fueled in the back of a pick-up truck with a bed liner due to static electricity concerns. No smoking will be permitted within at least 50 ft of flammable liquid use or storage.

8.3.3 Radioactive Materials Handling Procedures

Radioactive materials are not expected to be encountered at this project site.

8.3.4 Spill Contingency

Small quantity containers of chemicals will be used at the work site, which will minimize the amount of hazardous materials that could potentially become part of a spill should an accident occur. The majority of chemicals used will include fuels, oils and lubricants for use in vegetation clearance equipment. Spill clean-up kits will be available for use to clean up these chemicals and the impacted soils in the event a spill occurs. Chemical-resistant gloves will be used during all cleanup activities. The spilled chemical and the contaminated soil will be cleaned up, placed in labeled plastic bags, and stored in Department of Transportation-approved containers or other secured location until such time as they can be removed from the site and sent to a certified disposition facility.

8.4 DRUM, CONTAINER, AND TANK HANDLING

USA does not anticipate the use of drums, containers, or tanks during activities under the SOW.

8.5 COMPREHENSIVE ACTIVITY HAZARD ANALYSIS OF TREATMENT TECHNOLOGIES

Treatment technologies are not expected to be used on this project.

9.0 SITE CONTROL MEASURES

Site control measures are used to prevent or minimize the potential for site hazards. The site control measures, as well as all requirements of this SHSP, are mandatory for all personnel entering the EZ of this project site. Authorized government personnel will undergo the mobilization training along with all USA personnel, which includes a briefing in all of the requirements of this SHSP. All personnel receiving this training must sign a statement that they were trained and fully understand the requirements of this SHSP.

9.1 SITE MAP

A site map (refer to Appendix A of the Work Plan for detailed site maps) will be utilized by the UXOSO during the tailgate safety briefing to inform the workers of the location of hazardous areas on the site, the assembly areas to be used in the event of site evacuation, and any other information relevant to the day's activities. The site map will include:

- Site topography
- Site work zones
- Location of unusual/hazardous areas
- Prevailing winds
- Ingress and egress corridors
- Evacuation routes and assembly points
- Location of emergency supplies.

9.2 WORK ZONE DELINEATION AND ACCESS POINTS

Site work zones will be established by the UXOSO prior to initiating operations to control site access. Establishment of site work zones is based upon site conditions, activities, and exposure potentials. A site EZ will be set up, which includes the footprint of the area where work will take place and a 132-ft minimum distance around that to protect areas outside the site from potential site hazards, based on the primary MGFD. Within the EZ, operating teams will maintain at least a 23-ft MSD, to protect the teams from each other's operations. Site work zones will be marked using barricades and signage closing roads into the area to unauthorized vehicular traffic. Barricades and signs will remain in place for the duration of site operations. Should a more hazardous round be encountered on the site, the contingency MGFD will be used to determine a new EZ boundary of 288 ft and a 50-ft MSD.

9.3 ON- AND OFF-SITE COMMUNICATION SYSTEM

On-site communication will be conducted by voice or hand signals. There may also be an alarm signal, such as an air horn, used for the purpose of site evacuation. Radio communication will also be used between teams.

If off-site communication is required, it will be established through the use of cellular telephones. The SUXOS and UXOSO will have cell phones available and all site vehicles will be equipped with either a cell phone or radio for communications between teams and the SUXOS or UXOSO. The list of emergency telephone numbers will be posted in each site vehicle and with each cell phone. Communications equipment will be tested daily prior to the start of field work to ensure there is always a means of emergency communication available to each team.

Site Access Control – The UXOSO will control access to each work zone and will ensure that all site workers and visitors have received the proper training and medical surveillance required to enter a specific zone. Access will be denied to any potential entrant not meeting these requirements. Site control is the primary means for protection of the general public from site hazards. The UXOSO will control access to each work zone to assure that unauthorized entry to the site cannot be made by the general public. The following work zones will be established at this site:

- **Exclusion Zone (EZ) –** Area where a significant hazard does or could occur and includes all areas where PPE is required to control worker exposure to chemical or physical hazards. All personnel entering the EZ will be logged in/out by the UXOSO. All visitors to the EZ must be escorted by a UXO-qualified USA employee (normally this is the UXOSO). The EZ of this site will be designated as the footprint area of actual project operations and the buffer zone around it of at least 132 ft. This is the HFD of a 40mm Mk2 projectile (the MGFD). The minimum separation distance between teams is 23 ft, which represents the K40 distance of the MGFD. If a more hazardous MEC round is encountered, the distances would be increased based on the contingency MGFD (90mm M71 projectile) with a HFD of 288 ft and a K40 distance of 50 ft. Entry into the project area where the work will be performed will be under the control of USA. When personnel who are not UXO qualified are required to enter within the EZ, all UXO operations will cease until all unrelated personnel are outside of the EZ.
- **Support Zone (SZ) –** Area outside the EZ where site support activities are conducted. This zone includes break areas and sanitation facilities. Visitors desiring entry into the EZ must first meet with the UXOSO and receive the appropriate safety and emergency procedures briefing in the SZ before gaining admittance to the EZ. In addition, visitors will be escorted at all times by a UXO-qualified employee while in the EZ.

Site access control will be implemented by USA and will be accomplished through a program that limits movement and activities of people and equipment at the project site. This control will be based on site-specific characteristics, to include:

- Potential chemical, biological, physical or explosive hazards
- Terrain
- Expected weather conditions
- Planned site activities
- Site proximity to populated areas.

The degree of site access control will include the following:

- Controlled site ingress/egress points – Work area will be clearly visible to anyone approaching the site and vice versa. Signs will be posted to warn unauthorized personnel against entry into the area. Anyone entering the work area must clear access through USA. Only authorized personnel will be permitted within the EZ during MEC operations. All others will remain in the SZ.

- Worker/visitor registration – All personnel working on the site sign in daily at the time of their daily safety briefing in the morning. All visitors to the site must sign the visitor log when they report to the site for their visitor briefing.
- Escort of visitors – All visitors to the site will be escorted by a UXO-qualified USA employee. Visitors will be briefed on site hazards, PPE requirements, and emergency procedures. Visitors who are not UXO-qualified will not be permitted within the EZ during MEC operations. If visitors need to access the EZ, all MEC operations will cease while they are in the area, and the visitors will be escorted at all times.
- PPE requirements – PPE requirements have been established based on the site hazards. Personnel working in areas requiring PPE will wear required PPE for the duration of the operation. Visitors to the area will be required to have the required PPE for the area they will be visiting.

9.4 SECURITY PROCEDURES

As the Navy no longer has a presence on this site, USA will provide security for site operations. Live MEC encountered during site operations will undergo a blow-in-place disposal operation. If the MEC disposal operation cannot take place on the date that the item is encountered, USA will guard the item until such time as the disposal operation can take place, in order to protect the general public.

10.0 PERSONNEL HYGIENE AND DECONTAMINATION FACILITIES AND PROCEDURES

Sanitation facilities will be provided in the SZ area so that employees can wash prior to eating, drinking, smoking, or engaging in any other hand-to-face activities. Chemical toilets will be available in the SZ of the work area. As chemical contamination is not expected to be an issue at this site, basic washing of equipment and standard hygiene practices are the minimum requirements. Site sanitation will be established and maintained in accordance with OSHA 29 CFR 1910.120(n).

- Temporary toilet facilities will be provided in the work area of the site. Chemical toilets will be used in these locations and will be serviced every week. Each temporary toilet will be naturally lighted, have a toilet seat with a seat cover, have a urinal, have ventilation with vents screened, and be lockable from the inside. There will be at least one toilet for every 15 workers at the work site, as required.
- Hand- and face-washing facilities will be set up at the USA work site and will be utilized by all personnel exiting the EZ prior to eating, drinking, tobacco use, or other hand-to-face activities. Paper towels will be provided for drying. A trash receptacle will be provided for discarded paper towels. In accordance with ANSI Z358.1-1998, eyewash facilities will be available on all work sites where operations involve handling substances that could be hazardous to the eyes. An eyewash kit consisting of bottled eyewash solution will also be located in each site first aid kit.

General work practices include the following:

- Safe work practices will be implemented when possible to eliminate or reduce the potential for employee exposure.
- Employees will wash their hands immediately or as soon as feasible after removal of gloves or other PPE.
- Employees will wash hands and any other skin with soap and water, or flush mucous membranes with water immediately following contact with blood or potentially infectious materials.
- If potentially contaminated sharps are encountered, the item will immediately be disposed of in an appropriate puncture-proof container or decontaminated.
- Eating, drinking, smoking, applying cosmetics or lip balm, handling of contact lenses, or storage/handling of food are prohibited in all areas where potentially infectious or other hazardous materials are present.

- Equipment that has become contaminated will be decontaminated prior to servicing or storage, unless decontamination is not feasible, in which case the equipment will be disposed of properly.

10.1 EQUIPMENT DECONTAMINATION FACILITIES AND PROCEDURES

Due to the fact that chemical contamination is not anticipated to be a problem at this site, basic washing of equipment is all that will be required.

10.2 ON-SITE FIRST AID AND EMERGENCY PROCEDURES AND EQUIPMENT

A minimum of two USA employees on the site will be First Aid/CPR certified and will serve as the first responders to any site emergency. Any person(s) who becomes ill or injured during work activities must immediately inform the UXOSO regardless of the severity of the illness or injury. The UXOSO will alert the first responders to assist the victim. If the injury or illness requires professional medical attention, the UXOSO will summon emergency medical assistance and the ambulance will transport the victim to the hospital. All personnel at the work site will use the buddy system. All personnel using the buddy system will stay within sight of their partner. If a partner becomes incapacitated or severely ill, the UXOSO will be called. In the event that a cessation of work is ordered, all personnel should:

- Assist the first responders as required, in administering first aid
- Leave the area if the hazard warrants such action.

If the medical emergency is not severe (requiring only first aid), the victim will be treated on site by the first responders, with additional treatment at the hospital or clinic if required. If the medical emergency is serious, the victim will be brought to the hospital via ambulance, where the victim will be stabilized and treated. The UXOSO will provide the ambulance and hospital personnel with the victim's medical background information and information on how the injury or illness occurred.

It is not anticipated that hazardous waste decontamination will be required during any activities under the SOW. This determination has been made based upon archival documentation and past activities conducted at the site. Basic cleaning and disinfection is all that will be required prior to most types of treatment. If a worker is accidentally injured using chemicals brought onto the site, the first aid procedures described in the MSDS will be followed by the first responders to clean as much of the chemical off as possible before treatment, and the MSDS would be provided to the ambulance crew to take with the victim to the hospital.

An approved emergency first aid kit, blood-borne pathogen kit, CPR mask, stretcher, blankets, eye wash kits, trauma supplies, and basic emergency equipment will be kept in the UXOSO vehicle. First aid kits are assigned by the Safety Office and approved by the Occupational Health Physician. The UXOSO will be charged with providing regular inspections of the emergency supplies, replacing any items that are used, and maintaining readiness.

Eyewash kits will be located in the work area. A 10B:C fire extinguisher will be kept in each site vehicle for emergency use on site. This equipment will be inspected on a weekly basis to ensure it is maintained and ready to use. Fire extinguishers located on vehicles must be readily available to the driver or operator. Any used items will be replaced immediately.

Fire extinguishers will be stored where they are well marked and readily accessible. Fire extinguishers will be protected from the damaging effects of environmental elements. The UXOSO is responsible for ensuring that all fire extinguishers are visually inspected monthly and that these inspections are documented. All site personnel will be familiar with the locations of fire extinguishers and will be trained in their use.

10.2.1 Emergency Response Plan and Contingency Procedures

The Emergency Response Plan and contingency procedures address emergencies that could occur during site operations, and outlines the appropriate response actions. This information can be found in Section 9.2, "Emergency Response Plans," of the APP.

10.2.2 Emergency Response Plan

10.2.2.1 Operations

The following operations require the use or potential for exposure to hazardous substances:

- MEC operations
- Vegetation clearance operations.

10.2.2.2 Pre-Emergency Planning with Local Responders

An agreement will be established between USA and emergency response personnel and the hospital regarding responsibilities of each party in responding to a project site emergency. The UXOSO will verify all on-site emergency services information, to include procedures for requesting services. It will be the UXOSO's responsibility to post these procedures and contact information in accordance with the requirements of this SHSP and APP. Pre-emergency planning tasks include:

- Post emergency instructions and call numbers at accessible telephone locations
- Inspect all emergency equipment and supplies to ensure they are in proper working order
- Provide a site map marked with planned evacuation routes, assembly points, and emergency equipment and supplies
- Provide a map with the route to the hospital marked and highlighted, with copies of this map posted in all site vehicles
- Conduct an emergency response drill to test the effectiveness of the Emergency Response Plan and Contingency Procedures (ERCP)
- Review and revise the ERCP in the event of a failure of the plan in an actual or staged emergency, or when changes in site conditions or SOW affect the ERCP.

Before normal activities are resumed, onsite personnel must be prepared and equipped to handle another emergency. These follow-up activities should be completed:

- The CHSM will notify appropriate government agencies as required. (Reminder: OSHA must be notified if there have been any fatalities or three or more hospitalizations from the same event.)
- All equipment and supplies restocked, serviced and inspected
- Review and revise all aspects of the SHSP as necessary to address and prevent future emergencies of this type.

As part of mobilization training, prior to start of project, all personnel will review the points of contact list and where it is posted as well as location of the nearest hospital. A meeting place off site will be identified in case of emergency evacuation and the responsibilities of all persons on site. All personnel will review the locations of fire extinguishers and be competent to use one properly. All emergency telephone numbers will be posted next to the directions to the hospital map on site.

10.2.2.3 Personnel Roles, Lines of Authority, Training, and Communication

In the event of an emergency, the UXOSO will be designated as the On-Scene Incident Commander and will have the overall responsibility for implementation of the ERCP and coordination with responding off site emergency services. In the event of a medical emergency, the UXOSO will call in the first responders and the UXOSO will determine if professional medical assistance (EMS) is required and will summon emergency response personnel.

a. Personnel and Lines of Authority

Specific responsibilities of the UXOSO include, but are not limited to, the following:

- Notifying local police, fire department, and other off-site emergency units, as required

- Notifying the NAVFAC RPM and providing updates as conditions change
- Directing off-site emergency response personnel to the scene and providing assistance
- Site control
- Completing any follow-up reports
- Rescuing personnel
- Accounting for all site personnel and visitors
- Providing emergency first aid
- Preventing further injury of personnel
- Providing current status of the incident to the USA CHSM
- Ensuring that on-site emergency response personnel don the proper PPE if needed
- Assisting on-site emergency response personnel with treatment and transport of sick/injured
- Providing medical background information of the sick/injured and applicable site health and safety information to the off-site emergency medical responders
- Accompanying sick/injured personnel to hospital.

If the emergency involves employee injury, UXOSO will complete the USA Accident Report. The CHSM will be responsible for notifying applicable Federal, state and local authorities/agencies. Once the emergency has been resolved, the UXOSO, Project Manager, and CHSM will conduct a follow-up investigation and critique. Actions will be taken to prevent recurrence.

All USA personnel and visitors will be responsible for:

- Reporting any site emergencies to the SUXOS or UXOSO
- Knowing the exit location and evacuation route within the EZ
- Knowing the pre-planned evacuation assembly point and going there in the event of an emergency
- Assisting emergency response personnel as requested.

b. Training

USA personnel receive training in emergency procedures in response to potential incident scenarios of all kinds on the site as part of their mobilization training. Part of this training involves the clean-up of small spills of hazardous materials, as well as the use of emergency equipment such as fire extinguishers, etc.

c. Communication

Communications between USA teams on the site will be verbal or via radio, depending on location. USA maintains cell phone communication capabilities in order to call for emergency assistance as required.

10.2.2.4 Emergency Recognition and Prevention

An emergency is an unplanned event that threatens the safety of any personnel. Compliance with this SHSP can assist in the prevention of anticipated site emergencies. These emergency situations can easily be recognized by visual observations, worker complaints, or monitoring instruments.

There are several emergencies, which could reasonably be anticipated during project activities, including:

- Thermal stress
- Worker injuries, slips, trips or falls, and/or illness
- Fires and explosions
- Health emergencies.

Prevention of emergencies will be aided by the effective implementation of this SHSP and APP, personnel awareness, contingency planning, and on-site safety meetings. Anticipated emergencies may include physical injury, illness, fire, explosion, chemical spill or release, inclement weather, and natural disasters. The UXOSO will use the site-specific briefing and/or the Tailgate Safety Briefings to inform site workers of the recognition, prevention, and response procedures for each anticipated emergency.

In the event of an emergency, site personnel will be notified by either an alarm or verbal communication. Personnel will be notified to:

- Stop work activities
- Evacuate to the designated assembly point at the SZ
- Begin emergency procedures
- Notify off-site emergency response organizations.

After evacuation, the UXOSO will account for all personnel, ascertain information about the emergency and advise responding onsite personnel. The UXOSO will contact, advise, and coordinate with responding off-site emergency personnel if deemed necessary by the situation.

In all situations that require evacuation, personnel will not re-enter the work area until:

- The conditions causing the emergency have been corrected
- The hazard has been reassessed
- The SHSP has been revised and reviewed with onsite personnel, if needed
- Instructions have been given for authorized re-entry by the UXOSO.

10.2.2.5 Safe Distances and Places of Refuge

The UXOSO will determine safe distances and places of refuge. Prior to the start of each workday, the UXOSO or SUXOS (as applicable) will hold a safety meeting with all personnel and discuss the following:

- Times when the gate to sites may be locked
- Who has the gate key or combination on site
- Evacuation routes from work areas
- The assembly point to be used in the event of an emergency
- Locations of the nearest fire extinguishers and spill containment equipment
- Discussion of specific health and safety concerns of personnel.

The EZ of this project is the actual project footprint and an additional distance of at least 132 ft. This represents the HFD of the primary MGFD. Everything beyond that distance is the SZ. Normally, during an evacuation, personnel would evacuate to the SZ, where the UXOSO would take roll and account for all site personnel. In response to a fire situation, the EZ would be expanded to the maximum fragment distances of the MGFD, which is 1,095 ft. In the case of encountering a CWM item, personnel would evacuate at least 450 ft upwind of the item. This location would change with the shifting winds, so it cannot be specifically identified.

10.2.2.6 Site Security and Control

USA will maintain control of the site during operations. The site will be marked and visitors will be required to check in with the SUXOS and/or UXOSO in the SZ, where they will receive a briefing on safety and emergency procedures of the site. Visitors to the site will also provide documentation to verify that they have current HAZWOPER Training and a HAZWOPER physical that will allow them to enter a hazardous waste operations site. Visitors meeting these requirements who have a need to access the site will be required to have a UXO-qualified escort for the duration of their visit to the site (normally the

UXOSO) and wear the PPE required for site operations. Unauthorized persons will not be admitted into the EZ of the site.

During an emergency situation, USA personnel will evacuate personnel from the area. Emergency responders will be called to the site to assist as required. USA personnel will man the access roads to the site at least fragmentation distance from the EZ in order to prevent unauthorized personnel from entering. USA personnel will inform emergency responders of MEC or other known hazards at the site, required PPE for entering the site and provide assistance to emergency responders if requested to do so.

10.2.2.7 Evacuation Routes and Procedures

The UXOSO will establish evacuation routes. Evacuation notification will be one long blast on an air horn, vehicle horn, or direct verbal communication. If evacuation is necessary, all personnel are to:

- Gather equipment to the extent safely possible
- Evacuate to the vehicle(s) location and prepare to move out.

In the event of an emergency requiring evacuation, the evacuation signal will be given as an alarm or through verbal instructions. Personnel will evacuate to a pre-determined evacuation point in the SZ. The UXOSO will account for all personnel and will summon emergency response personnel, if required. If the Fire Department is summoned, the UXOSO will meet them upon their entrance to the site and will inform them of the presence of MEC, and provide the appropriate fragmentation distance from the fire for the purpose of fighting or preventing the spread of fire from the site.

Potentially hazardous weather conditions will be closely monitored by the UXOSO. The UXOSO will determine if high wind or heavy rain conditions pose a hazard to site operations, in which case personnel will evacuate to the pre-determined evacuation point and will wait for conditions to clear or for further instructions from the UXOSO.

After the emergency situation has been controlled and eliminated, or has passed, the Project Manager, UXOSO, and CHSM will review the way the emergency was handled and change procedures if necessary.

After allowing the appropriate wait time (24 hours in the case of a fire), the SUXOS and the UXOSO will enter the site together and determine if the site is safe for re-entry. If MEC is encountered that may have been subjected to extreme temperatures in a fire, it will be considered unacceptable to be moved and will require a “blow in place” disposal operation.

10.2.2.8 Decontamination

Due to the nature of work to be performed on this site, personnel are not expected to come into contact with leaking hazardous substances, so personnel decontamination stations are not required. Basic hygiene practices will be followed.

10.2.2.9 Emergency Medical Treatment and First Aid

Due to the nature of work to be performed on this site, a significant hazardous substance spill is unlikely to occur. However, there will be a minimum of two personnel trained and certified in First Aid/CPR onsite who will respond to site emergencies and will provide first aid care as necessary until medical authorities arrive and take over. They will have supplies and equipment on hand to decontaminate any chemical substance from the victim and to provide first aid treatment.

10.2.2.10 Emergency Alerting and Response Procedures

The emergency alerting procedures for a hazardous substance spill is the same for other emergencies that could occur on this site. In the event of an emergency, site personnel will be notified by either an alarm, radio or verbal communication. Personnel will be notified to:

- Stop work activities

- Evacuate to the designated assembly point at the SZ
- Begin emergency procedures
- Notify off-site emergency response organizations.

10.2.2.11 Critique of Response and Follow-Up

Following any emergency drill or actual emergency, the PM, SM, SUXOS, UXOSO, and CHSM will review the incident or drill and evaluate the effectiveness of the emergency response. If there were areas of weakness in the emergency response action, the procedures will be adjusted accordingly in order to address problems prior to the next emergency.

10.2.2.12 PPE and Emergency Response Equipment

Due to the SOW for this project, special PPE will not be required for responding to an emergency. An approved emergency first aid kit, blood-borne pathogen kit, CPR mask, stretcher, blankets, eye wash kits, trauma supplies, and basic emergency equipment will be kept in the UXOSO vehicle and will be available for use. Each field team will have access to a first aid kit, eye wash and fire extinguishers. A minimum of two USA employees on the site will be First Aid/CPR certified and will serve as the first responders to any site emergency. The UXOSO will be charged with providing regular inspections of the emergency supplies, replacing any items that are used, and maintaining readiness.

10.2.3 Emergency Response Team

In the event of an on-site emergency the individual team leader or first person aware of the emergency will contact the UXOSO. There will be at least two site personnel who are currently trained in First Aid/CPR. The UXOSO will normally be responsible for contacting the first responders to render emergency first aid treatment, and the UXOSO will authorize site personnel to assist, where required. The UXOSO will contact the ambulance to transport the victim to the hospital, should that be needed. If the order is given to evacuate the site of all personnel, each on-site team leader will assemble, account for, and evacuate all team personnel to the pre-designated staging area in the SZ.

The UXOSO will function as the On-Scene Incident Commander in emergency response actions. During any site emergency, the UXOSO will direct other site workers to assist in such areas as using fire extinguishers to put out fires in their incipient stages, setting up barricades, evacuation to the designated evacuation location in the SZ, etc. The UXOSO will be responsible for assessing the situation and for calling for assistance from local emergency response organizations. The UXOSO will interface directly with emergency response organizations when they arrive on the site and will direct USA workers to assist if requested to do so. The UXOSO will ensure that the Fire Department, if called to the site, does not approach any closer than 1,095 ft from the fire, which is the maximum fragment distance of the MGFD.

10.2.3.1 Personnel Training Requirements

Training in emergency procedures will be accomplished as part of the site mobilization training and by performing drills. After any drill or real emergency scenario, the PM, CHSM, SUXOS and UXOSO will evaluate the situation and determine any potential areas for improvement in the procedures. Procedures will be updated accordingly, and all site personnel will be made aware of any such changes.

At least two personnel on the site will have current training in First Aid/CPR.

10.2.3.2 Emergency Response Team Responsibilities

The site Emergency Response Team (ERT) will respond in a defensive manner to all emergency situations that arise on the site. The ERT will be trained to respond to all types of emergencies that are expected to arise on this project site. According to the SOW for this project, major hazardous substance releases are not expected to occur; however, site personnel will be trained and equipped to respond to small spills of chemical materials. All site personnel will be trained in the use of a fire extinguisher and the situations when a fire extinguisher should and should not be used. The personnel trained in First

Aid/CPR will respond to all injury situations in order to provide first aid assistance until professional medical assistance arrives.

10.2.4 Confined Space Entry

Confined spaces are not expected to be an issue on this site, so confined space entry procedures will not be required.

10.2.5 Logs, Reports and Record Keeping

USA will perform and document safety inspections, as well as maintain a site visitor log. Personnel records will be kept on site, which document medical surveillance and appropriate training certifications. In addition, accident reports and site monitoring reports will be maintained on site. All site logs, documents, and records will be included in the final report.

10.2.5.1 Recordkeeping Procedures

Each person on the site will have an individual file folder, which contains a copy of the following:

- 40-hr HAZWOPER Certificate
- Current 8-hr HAZWOPER Annual Refresher Certificate
- 8-hr HAZWOPER Supervisor Certificate, if applicable
- EOD Training Certificate
- Any other applicable training certificates.

Personnel folders will be maintained by the UXOSO on site for the duration of site activities. A Training/Tailgate Safety Record will be completed for all on-site daily training. The UXOSO will maintain the file, which will be made available for the client as requested.

a. Training Logs

Training logs documenting all training received on the project site will be maintained by the UXOSO. This will include mobilization training, daily safety briefings, as well as other training and safety meetings. APP/SHSP training will be documented with signature sheets, which will remain on site for the duration of project operations. Daily safety briefings will also be documented on forms and signed by all personnel in attendance with forms maintained in files on site. Formal training in PPE, equipment familiarity, etc. will also be documented on USA Documentation of Training forms and will remain on file at the site for the duration of site operations.

b. Daily Safety Inspection Logs

The UXOSO will perform and document daily and weekly safety inspections of all site operations on a scheduled and non-scheduled basis. The UXOSO will conduct non-scheduled safety and health inspections as deemed appropriate, based upon the ongoing site activities. Scheduled safety and health inspections will be conducted as outlined in Table 10-1. When discrepancies are observed, follow-up will be documented in the UXOSO log until the corrective actions required have been completed.

Table 10-1: Inspection Type and Frequency

Area	Frequency
Sanitation	Daily
Medical and First Aid	Daily
Temporary Facilities	Weekly
Personal Protective and Safety Equipment	Daily
Hazardous Substances, Agents, and Environments	Weekly
Hazardous Materials Inventory	Weekly
Lighting	Monthly
Accident Prevention Signs, Tags, Labels, and Signals and Piping System Identification	Monthly
Fire Prevention and Protection	Weekly
Hand and Power Tools	Daily, if applicable
Material Handling, Storage and Disposal	Weekly
Machinery and Mechanized Equipment	Daily, if applicable
Motor Vehicles	Daily
Safe Access and Fall Protection	Weekly, if applicable
HTRW	Daily, if applicable

c. Employee/Visitor Registers

The Visitor's Log will be maintained by the UXOSO and will document the visitor's name, company name, date, time, and reason for visit. There will also be documentation that the visitor was given a safety briefing prior to being permitted to enter the EZ of the site. Visitors will be escorted by UXO personnel at all times within the EZ. MEC operations will cease while visitors are within the EZ. The Visitor's Log will be maintained on the site for the duration of site operations.

Employees sign in each day on the daily safety briefing forms, which are maintained on site for the duration of site activities.

d. Medical Surveillance Records and Certifications

A copy of the Physician Statement from a licensed physician who is certified in Occupational Medicine by the American Board of Preventive Medicine, regarding the current annual HAZWOPER physical examination, will be maintained in the personnel folder with the HAZWOPER certificates. The Physician Statements will remain in the individual's file on the project site for the duration of site operations. The files will then be transferred to the USA Corporate Office in Oldsmar, FL, at the end of site operations.

e. Site Monitoring Results

All site monitoring results will be documented. These records will be kept in a file at the project site for reference, and will become a part of the permanent site record at the conclusion of site activities. At this site, heat exposure monitoring is the only monitoring anticipated, and that is dependent upon the site temperature and wind speed. No air monitoring is anticipated at this site.

f. Personal Exposure Records

Due to the SOW on this project, chemical exposures are not expected to occur. If changes in the SOW occur to require personal monitoring, this SHSP will be updated accordingly.

10.2.5.2 Personal Exposure and Medical Monitoring Records

Personal exposure records are not expected to be required on this project site. Medical monitoring records will be maintained in the individual personnel files on site for the duration of site operations. At the end of the field work, these records will be transferred to the USA Corporate office in Oldsmar, Florida, for the duration of employment plus 30 years.

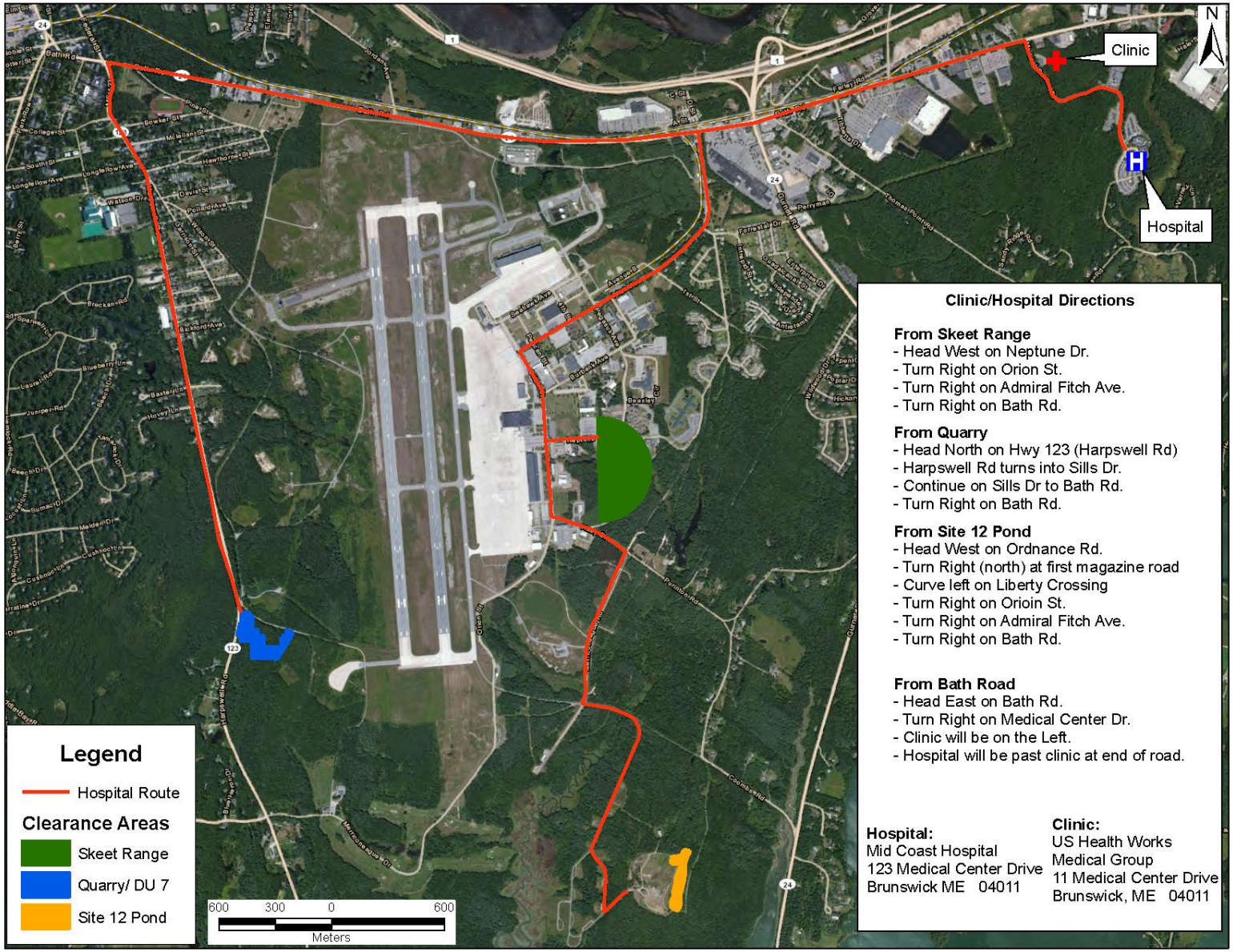
10.2.5.3 Final Report

USA will develop, retain and submit as part of the final report, all visitor registration logs, training logs, and daily safety inspection logs as part of the daily quality control reports.

This space is intentionally left blank.

ATTACHMENT 1.
MAP AND DIRECTIONS TO HOSPITAL

This page is intentionally left blank.


N
Clinic
Hospital
Clinic/Hospital Directions
From Skeet Range
- Head West on Neptune Dr.
- Turn Right on Orion St.
- Turn Right on Admiral Fitch Ave.
- Turn Right on Bath Rd.
From Quarry
- Head North on Hwy 123 (Harpswell Rd)
- Harpswell Rd turns into Sills Dr.
- Continue on Sills Dr to Bath Rd.
- Turn Right on Bath Rd.
From Site 12 Pond
- Head West on Ordnance Rd.
- Turn Right (north) at first magazine road
- Curve left on Liberty Crossing
- Turn Right on Orioin St.
- Turn Right on Admiral Fitch Ave.
- Turn Right on Bath Rd.
From Bath Road
- Head East on Bath Rd.
- Turn Right on Medical Center Dr.
- Clinic will be on the Left.
- Hospital will be past clinic at end of road.
Hospital:
Mid Coast Hospital
123 Medical Center Drive
Brunswick ME 04011
Clinic:
US Health Works
Medical Group
11 Medical Center Drive
Brunswick, ME 04011
Legend
Hospital Route
Clearance Areas
Skeet Range
Quarry/ DU 7
Site 12 Pond
600 300 0 600
Meters

This page is intentionally left blank.

APPENDIX D. DRUG-FREE WORK PLACE PROGRAM

A copy of USA Environmental's Drug-Free Work Place Program is provided in this appendix.

This space is intentionally left blank.

This page is intentionally left blank.

DRUG FREE WORK PLACE PROGRAM

January 01, 2013

The USA ENVIRONMENTAL, INC. program is an extension of our work safety and employee health programs. The program requires refraining from substance abuse both on and *off* the job as a condition of continued employment.

WHAT IS SUBSTANCE ABUSE?

Federal Acquisition Regulation Clause 23.500 defines substance abuse as the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in the workplace. USA ENVIRONMENTAL INC.'s program further expands that definition as follows: Substance abuse includes but is not limited to the consumption, by any means, of any legal or illegal substance that alters an individual's normal behavior and results in intoxication and/or renders the employee incapable of safe/efficient job performance. Substance abuse also includes over use or abuse of legally prescribed drugs. Also prohibited are the use of, selling, trading, giving away, possession or offering for sale illegal drugs, prescription drugs, or alcohol whether on company property, while operating a company vehicle or company-leased vehicle (on or off company property and during working or non-working hours), or operating a personal vehicle while on company business.

USA ENVIRONMENTAL SUBSTANCE ABUSE TESTING PROGRAM

The substance abuse program includes substance abuse testing under the following situations:

1. Pre-employment testing.
2. Testing for reasonable suspicion of substance abuse.
3. Testing following on-the-job accidents.
4. Testing as part of all "fitness for duty" medical examinations.
5. Quarterly testing for a period of 2 years after program completion for all employees participating in a substance abuse rehabilitation program.
6. Random testing of employees to promote abstinence.
7. Testing following a 30-day or greater layoff or return to work following a leave of absence or termination.

A urine, saliva or blood specimen will be analyzed for the presence of any of the following substances:

1. Marijuana - Cannabinoids, THC
2. Cocaine
3. Methadone - Dolophine, Methadose
4. Barbiturates - Nembutal, Tuinal, Seconal, etc.
5. Amphetamines - Desoxyn, Biphetamine, Dexedrine, etc.
6. Methaqualone - Qualudes
7. Opiates - Codeine, Percodan, Paregoric, Morphine, etc
8. Propoxyphene - Darvon, Dolene, etc.
9. Phencyclidine - (PCP)
10. Benzodiazepines - Librium, Valium, Xanax, Serax, Halcion, etc.

(Alcohol as required through breathalyzer or other testing means – Ethyl Alcohol as a beverage or as part of a medication)

A list of the most common drugs or medication by brand name, common name, as well as chemical name, which may alter or affect a drug test will be provided to all job applicants and employees at the time of testing.

A form is provided for employees or job applicants to report, voluntarily and confidentially, the use of prescription or non-prescription medications both before and after being tested.

Specific confirmation testing will be performed for all positive screening test results. Employees testing positive for prescription drugs that are commonly abused must produce evidence from their attending physician to justify the treatment necessity for use of the drug(s).

USA ENVIRONMENTAL, INC. is responsible for testing costs, except for test costs incurred by the employee or job applicant challenging test results.

RANDOM TESTING

Unless prohibited by law, USA ENVIRONMENTAL, INC. reserves the right to randomly test its employees for substance abuse. The number of personnel tested and the frequency of tests will be solely at the discretion of USA ENVIRONMENTAL, INC. or as contractually specified by USA ENVIRONMENTAL INC.'s clients.

REASONABLE SUSPICION TESTING

Employees reporting to work or a USA ENVIRONMENTAL, INC. job site who demonstrate impaired conduct will be interviewed by two (2) supervisors or managers to determine the cause of the irregular behavior.

If both supervisors conclude that the irregular behavior is unsafe the employee will not be allowed to continue working and will be transported home or to a medical facility. The employee will not be allowed to drive any motor vehicle. If a medical problem is not the cause, the employee may be tested for substance abuse. The employee may also be tested for substance abuse regardless of the cause of irregular behavior.

Reasonable suspicion testing shall also be conducted when there is:

1. An independently corroborated report of observed substance abuse.
2. Evidence that an individual tampered with a drug test during his or her employment with USA ENVIRONMENTAL, INC.
3. Information that an employee caused or contributed to an accident while at work.
4. Evidence that an employee has used, possessed, sold, solicited, or transferred drugs while working on USA ENVRIONMENTAL, INC. premises or while operating vehicles, machinery or equipment belonging to USA ENVIRONMENTAL, INC.

Supervisors will complete an incident report for observed irregular conduct, documenting their observations and the results of the employee interview. Final disposition of the incident will be documented with signatures and the dates listed by both supervisors.

A copy of the supervisor's report will be provided to the employee with appropriate employee's signature of receipt.

This confidential Incident Report will be retained by USA ENVIRONMENTAL, INC. for a period of at least one (1) year.

CONSEQUENCES OF POSITIVE TEST OR TEST REFUSAL

Refusal or failure to submit to testing or positive test results following an on-the-job injury disqualifies an employee from Workers' Compensation benefits.

Testing positive for abused substances will eliminate applicants from employment consideration.

Any employee may be terminated from employment for a positive test result. Refusal or failure to submit to testing following an on-the-job accident or random test will result in termination of employment.

Any employee who is given a "second chance" must seek treatment. Time away from work for treatment will be in a leave without pay status. The USA ENVIRONMENTAL, INC. Employee Assistance Program (EAP) will coordinate the employee's treatment plan. If the employee is enrolled in the employee health benefit plan or another medical plan, it may provide benefits to help pay for this treatment.

A second positive test for abused substances will result in termination.

OTHER GROUNDS FOR TERMINATION

An employee bringing onto the USA ENVIRONMENTAL, INC. premises or job sites; having possession of; being under the influence of; possessing in the employee's body, blood or urine (at levels exceeding or equal to established cut-off levels, 38F-9.007 (4)); or using, consuming, transporting, selling, attempting to sell, or giving away any illegal drugs (including prescription drugs illegally obtained or prescribed for the individual only), or alcohol, at any time, is guilty of misconduct and is subject to discipline to include discharge, suspension without pay or other actions even for a first offense. USA ENVIRONMENTAL, INC. reserves the right to inspect the property and person of individuals suspected of illegal drug or alcohol possession while on company property or at company job sites (see Right to Inspect).

CHALLENGING TEST RESULTS

An employee may challenge a confirmed positive test by submitting an explanation in writing to the Human Resources Department concerning personal circumstances that might have affected test results. This challenge must be submitted within 5 working days following the employee's notification of a confirmed positive test result. The donor of a tested specimen will be responsible for providing all necessary documentation, i.e., a doctor's report, signed prescription or current prescription container with relevant information and other related supporting documents.

USA ENVIRONMENTAL, INC. will, within 15 days of receipt of the employee's written explanation or challenge of positive test results, provide a written explanation to the employee

as to whether, and if so, why, the employee's explanation is unsatisfactory, along with a copy of the positive test results.

The employee or job applicant desiring to challenge a test result will be responsible for notifying the original testing laboratory of an alternate HRS licensed laboratory, for the purpose of transferring, under Chain of Custody, a portion of the employee's or job applicant's specimen for re-testing. The employee may have a portion of their original specimen re-tested during a period of 180 days following written notice of a positive test result. When an employee undertakes a challenge to the result of a test, it shall be the employee's responsibility to notify the laboratory and the sample shall be retained by the laboratory until the matter is settled. Retesting will be at the employee's expense.

In the case of a denial of a workers' compensation claim, an employee may undertake an administrative challenge by filing a claim for benefits with a judge of compensation claims, concerning workplace injury. Other challenges not involving workplace injuries must challenge a test result in a court of competent jurisdiction.

Employees or job applicants may call the testing laboratory for technical information regarding prescription or non-prescription medications that may affect test results.

Employees and job applicants may report, in confidence, to their manager or Human Resources Director, the use of prescription or non-prescription medications that may affect job performance or testing results, either before or after testing.

Job applicants or employees whose drug test results are confirmed positive shall not by virtue of the result alone, be defined as having a "disability" under the Americans with Disabilities Act.

GETTING HELP
Employees who require a treatment program will be referred to USA ENVIRONMENTAL, INC.'s Employee Assistance Program (EAP).

Employees may inspect this program file and/or receive more information on the program on a confidential basis, in the USA ENVIRONMENTAL, INC. Human Resources Office, during normal hours of operation.

REQUIREMENT TO NOTIFY USA OF A CONVICTION
Any employee convicted of a criminal drug statute violation must notify USA ENVIRONMENTAL, INC., Attention: Human Resources Department, within 5 calendar days of the conviction. This notification must be in writing.

CONFIDENTIALITY OF INFORMATION
All drug test information, reasonable suspicion reports, or other related information concerning an employee or applicant will remain confidential and will not be disclosed except under conditions required by law.

Release of such information under any circumstances, other than those required by law, will be

solely pursuant to a written consent voluntarily signed by the person tested. The consent duration and precise information to be disclosed will be stated.

GOVERNMENTAL COMPLIANCE

The Drug Free Work Place Program is implemented pursuant to the requirements of Florida Statute 440.102 and Administrative Rules 38F-9-001 through 38F-9.014 of the Florida Department of Labor and Employment Security, Division of Workers' Compensation, and 48 CFR 23.500 (Federal Acquisition Regulation 23.500). Laws may be amended at project sites in other states due to those states' requirements.

Robin Miller
Vice President of Human Resources
and Administration

APPENDIX E. MATERIAL SAFETY DATA SHEETS

This Appendix contains the following Material Safety Data Sheets (MSDSs) applicable to work on this project:

- Asbestos and Asbestos-Containing Materials
- Cast Boosters
- Composition C-4
- Deep Woods Off
- Detonators
- Diesel Fuel No. 1
- Fire Extinguishers
- Gasoline, Unleaded
- Kinepact Liquid
- Oil, 2 cy
- RDX Nylon Det Cord
- Slurran 805/806
- WD 40.

This space is intentionally left blank.

This page is intentionally left blank.

Genium Publishing Corporation
1145 Catalyn Street
Schenectady, NY 12303-1836 USA
(518) 377-8854

Material Safety Data Sheets Collection:

Sheet No. 15
Asbestos and Asbestos-containing Materials

Issued: 11/90

S,U,O,E,P

4774

Section 1. Material Identification 33

Asbestos and Asbestos-containing Materials Description: Asbestos is a generic term applied to many naturally occurring, hydrated silicates (minerals) found in rock which separate into flexible fibers when crushed or processed. Commercially important forms are amosite, anthrophyllite (mined and used only in Finland), chrysotile, and crocidolite. Other types include tremolite and actinolite. Most widely used in US industry is chrysotile, a fibrous form of serpentine. Since asbestos is insensitive to chemical attack and incombustible, there are over 2000 uses as processed fiber. It is added to such diverse materials as cement, vinyl, plaster, asphalt, and cotton, although due to its health hazards other materials are now replacing it wherever possible. Its use is now limited to products that bind fibers within the product. The largest use of asbestos is in asbestos cement for pipes in water supply, sewage disposal, and irrigation systems; ducts; and flat and corrugated sheets for a wide variety of construction applications. Other uses include fire-resistant textiles, floor tiles, underlayment and roofing papers, friction materials (brake linings), reinforcing filler in elastomers for packing and gaskets, reinforcing pigment in surface coatings and sealants, thermal and electrical insulation media, as a component of taping compound and industrial talcs, and as filler in industrial greases. About 98% of crocidolite is used in production of asbestos cement pipe. Between 1950 and 1972 asbestos was used as spray insulation in buildings, but OSHA now prohibits spray application of actinolite, anthophyllite, asbestos, or tremolite (29 CFR 1910.1001).

Other Designations: CAS No. 12172-73-5, amosite, brown asbestos; CAS No. 1332-21-4, asbestos; CAS No. 12001-29-5, chrysotile, white asbestos; CAS No. 12001-28-4, crocidolite, blue asbestos; Ascarite; earth flax; mountain cork; stone flax.

Molecular Formulas: Amosite, $(FeMg)SiO_3$; anthophyllite, $(MgFe)_7Si_8O_{22}(OH)_2$; chrysotile, $3MgO{\cdot}2SiO_2{\cdot}H_2O$; crocidolite, $NaFe(SiO_3)_2{\cdot}FeSiO_3{\cdot}H_2O$; tremolite, $Ca_2Mg_5Si_8O_{22}(OH)_2$.

Manufacturer: Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*(73) for a suppliers list.

Cautions: Asbestos causes three specific diseases: asbestosis (fibrous lung scarring), lung cancer, and mesothelioma (cancer of the chest lining and abdominal cavities). Prevent or maintain exposures at the lowest feasible level.

R 0
I 4
S 1
K 0
Genium

HMIS
H 3
F 0
R 0
PPG*
* Sec. 8

Section 2. Ingredients and Occupational Exposure Limits

	1989 OSHA PELs*			1990-91 ACGIH TLVs	1988 NIOSH REL
Asbestos	**TWA:** 0.2 f/cc†	**Action Level TWA:** 0.1 f/cc	**Excursion Limit:** 1.0 f/cc‡	**TWA:** 2.0 f/cc§	0.1 f/cc
Amosite	0.2 f/cc	0.1 f/cc	1.0 f/cc	0.5 f/cc	0.1 f/cc
Chrysotile	0.2 f/cc	0.1 f/cc	1.0 f/cc	2.0 f/cc	0.1 f/cc
Crocidolite	0.2 f/cc	0.1 f/cc	1.0 f/cc	0.2 f/cc	0.1 f/cc

1985-86 Toxicity Data for Asbestos (CAS No. 1332-21-4)**
Human, inhalation, TC_{Lo}: 1.2 fb/cc, continuous exposure over 19 years. Toxic to lungs.

* OSHA has proposed a lower asbestos exposure limit of 0.1 f/cc as an 8-hr TWA (*Industrial Safety and Hygiene News*, 8/90).
† Fiber/cm³
‡ Average over a 30-min sampling period.
§ As determined by membrane filter method at 400 to 450X magnification (4-mm objective) phase contrast illumination. Fibers longer than 5 μg and with an aspect ratio ≥ 3:1 (ACGIH).
** See NIOSH, *RTECS* (CI6475000), for additional toxicity data.

Section 3. Physical Data

Melting Point: Decomposes
Water Solubility: Insoluble (breaks down slowly in hot water)
Molecular Weight: Varies with asbestos form (Sec. 1)
Appearance and Odor: White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite) fibrous, odorless solids.

Section 4. Fire and Explosion Data

Flash Point: None reported	**Autoignition Temperature:** None reported	**LEL:** None rpeorted	**UEL:** None reported

Extinguishing Media: Asbestos is nonflammable. Use dry chemcial, CO_2, water spray, or regular foam. Do not scatter spilled material with high-pressure water streams. **Special Fire-fighting Procedures:** Isolate hazard area and deny entry. Since there may be airborne asbestos fibers, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode; structural firefighter's protective clothing provides limited protection. If feasible, remove containers from fire area. Avoid dust generation. Be aware of runoff from fire control methods. Do not release to sewers or waterways. Develop decontamination procedures for protective clothing and equipment.

Section 5. Reactivity Data

Stability/Polymerization: Asbestos is inert under ordinary room temperature and heated use conditions. It is heat resistant, but decomposes and alters its microscopic fiber structure above 600 °C (1112 °F). Chrysotile dehydroxylates at 1112 to 1436 °F (600 to 780 °C); the "asbestos anhydride" in turn breaks down to a mixture of silica (SiO_2) and fosterite (Mg_2SiO_4) at 1472 to 1562 °F (800 to 850 °C). Above 1832 °F (1000 °C) magnesium pyroxenes form and melt at ~2642 °F (1450 °C). **Chemical Incompatibilities:** Strong acids can attack chrysotile and rapidly extract its MgO and H_2O content; glacial acetic acid can decompose it. Hot water slowly breaks down chrysotile. Like other asbestos forms, it resists strong alkali (5M NaOH at least up to 100 °C).

Section 6. Health Hazard Data

Carcinogenicity: The NTP, IARC, OSHA, and ACGIH list asbestos as a human carcinogen. **Summary of Risks:** Asbestos may cause 1) asbestosis, 2) lung cancer, 3) mesothelioma, 4) pleural plaques, and 5) several other forms of cancer. *Asbestosis* is fibrosis (scarring) of lung tissue after many years of high-level occupational exposure. Scarring may be progressive even after exposure ceases. Even though detectable in lungs of a high proportion of adults in industrialized areas, asbestosis does not result from lower level environmental exposure. Its symptoms range from mild shortness of breath and dry cough to severe disabling breathlessness, heart failure, and ultimately death. Lung scarring can be seen on X-ray and alterations in lung function can be detected with spirometry (a medical test). Examination typically detects rales (crackling sounds in lungs). Severe cases may have cyanosis (bluish skin discoloration) and clubbing of fingertips. *Lung cancer* can result from lower exposure levels than asbestosis, but also takes many years to develop. Smokers exposed to asbestos are at 5 to 10X higher risk than exposed nonsmokers. *Mesothelioma* is a very aggressive cancer of the pleura (lining around the lungs) or peritoneum (lining of the abdomen), and develops after decades of (sometimes low level) exposure. Symptoms may include chest and abdominal pain, weight loss, and/or shortness of breath, with death within 2 years of diagnosis. *Pleural plaques* are thickenings, sometimes with calcium deposits, of the lungs's lining and may be seen on X-ray. While not associated specifically with health effects, they indicate significant exposure. *Other sites of cancer* include larnyx (vocal cords), portions of digestive tract, and possibly the kidney. Asbestos's toxicity depends on fiber type (crocidolite > amosite > chrysotile), size (longer > shorter), shape (long, thin needle-like > curly), and solubility. Health effects depend on dose (exposure concentration and duration), smoking habits, and individual susceptibility. Prevent or maintain exposures at lowest feasible level.

Continue on next page

Section 6. Health Hazard Data, *continued*

Medical Conditions Aggravated by Long-Term Exposure: Long-term, high-level exposure may aggravate any chronic lung (asthma, emphysema, bronchitis) or heart condition. **Target Organs:** Respiratory system; possibly digestive system. **Primary Entry Routes:** Inhalation, ingestion, dermal contact. **Acute Effects:** Nose, throat, skin and eye irritation are possible with high exposure. **Chronic Effects:** Asbestosis, lung cancer, and mesothelioma typically develop decades (20 to 40 years) after exposure begins, but may occur sooner. **FIRST AID** *Emergency personnel should protect against asbestos exposure.* **Eyes:** Do not rub. Gently lift eyelids and flush with flooding amounts of water. **Skin:** Shower with water and soap. Wet contaminated clothing prior to removal and seal in a plastic bag for disposal as hazardous waste. If rash develops, consult physician. **Inhalation:** Remove to fresh air. Clean any fibers from nose and mouth. Encourage victim to cough, spit, and blow nose to remove fibers. **Ingestion:** Induce vomiting *only* if awake and alert. Consult a physician. **After first aid, consult medical care provider. Note to Physicians:** Asbestos diagnosis is based on chest X-ray with an abnormal ILO "B" reading (small irregular opacities), rales, restrictive pattern spirometry, adequate exposure history, and symptoms. Consider pneumovax, annual flu shot, and other supportive treatment as needed.

Section 7. Spill, Leak, and Disposal Procedures

Spill/Leak: Notify safety personnel and evacuate all unnecessary personnel. Cleanup personnel should protect against dust inhalation and skin or eye contact. Avoid dust generation, blowing, dry brushing, and dry mopping. Provide HEPA-filtered (high-efficiency particulate air) portable ventilation systems. Use wet cleaning methods or approved HEPA vacuum cleaning system to pick up spills. The techniques used must collect particulate without dispersing dust into air. Place waste in *properly labeled* dust-tight containers or sealed, heavy-gauge, impervious plastic bags for disposal. Follow applicable OSHA regulations (29 CFR 1910.120). **Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

EPA Designations
RCRA Hazardous Waste (40 CFR 261.33): Not listed
Listed as CERCLA Hazardous Substance* (40 CFR 302.4), Reportable Quantity (RQ): 1 lb (0.454 kg) [* per Clean Water Act, Sec. 307(a); Clean Air Act, Sec. 112]
Listed as a SARA Toxic Chemical (40 CFR 372.65)
SARA Extremeley Hazardous Substance (40 CFR 355): Not listed
OSHA Designations
Listed as Air Contaminant (29 CFR 1910.1000, Table Z-1-A, Z-3)

Section 8. Special Protection Data

Note: *Do not substitute personal protective clothing or equipment for proper handling and engineering controls.* **Goggles:** Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). **Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. For airborne concentration of asbestos, tremolite, anthophyllite, actinolite, or a combination of these minerals not in excess of 2 f/cc (10 X PEL), use a half-mask air-purifying respirator, other than a disposable respirator, equipped with high-efficiency filters; not in excess of 10 f/cc (50 X PEL), a full facepiece air-purifying respirator equipped with high-efficiency filters; not in excess of 20 f/cc (100 X PEL), any powered air-purifying respirator equipped with high-efficiency filters or any supplied-air respirator operated in continuous flow mode; not in excess of 200 f/cc (1000 X PEL), a full facepiece supplied-air respirator operated in pressure-demand mode; greater than 200 f/cc (>1,000 X PEL) or unknown concentration, a full facepiece supplied-air respirator operated in pressure-demand mode and equipped with an auxillary positive-pressure self-contained breathing apparatus (29 CFR 1910.1001). *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* **Other:** Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact. **Ventilation:** Provide general and local exhaust ventilation and dust collection systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred since it prevents contaminant dispersion into work area by controlling it at its source.[103] **Safety Stations:** Make available in work area emergency eyewash stations, safety/quick-drench showers, and washing facilities. **Contaminated Equipment:** Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Never enter lunchroom facilities or leave workplace wearing clothing or equipment worn during workshift. Separate contaminated work clothes from street clothes. *If proper hygiene is not rigorously followed, family members can be exposed to asbestos fibers.* Place contaminated protective devices or work clothing in labeled, impermeable, and sealed containers or bags. Do not remove asbestos from clothing by blowing or shaking. Launder contaminated clothing before wearing. Inform laundering service of asbestos-contaminated clothing and of asbestos' potential harmful effects (29 CFR 1910.1001). **Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using asbestos, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9. Special Precautions and Comments

Storage Requirements: Store in closed (dust-tight) containers or heavy-gauge impervious plastic bags in a clean, secure area protected from physical damage. Do not open containers that can release asbestos dust without providing proper enclosure or control measure. **Engineering Controls:** Educate workers about asbestos's and asbestos-containing materials' hazards. Inform employees of asbestos standard (29 CFR 1910.1001). Exposure to asbestos, tremolite, anthophyllite, and actinolite in construction work is covered by 29 CFR 1926.58. ["OSHA is proposing an expanded requirement for a trained 'competent person' to ensure compliance with the standard on all construction operations involving asbestos, and requiring more stringent housekeeping to remove asbestos in general industry." (*Industrial Safety and Hygiene News*, 8/90).] Instruct employees in proper practices for handling asbestos-containing materials and correct use of protective equipment. Prevent or minimize asbestos exposure. Regulate areas where exposure in excess of the PEL is likely. Post warning signs in all regulated areas (see legend below). Work with asbestos only in a sufficient wet state to prevent emission of airborne fibers. Practice good personal hygiene and housekeeping procedures. Do not substitute personal protective equipment for proper handling and engineering controls. If exposures exceed the PEL, ensure employees wear appropriate protective clothing. Inhaling or ingesting asbestos fibers from contamined clothing or skin can be hazardous. Do not allow dusts and asbestos-containing wastes to accumulate. Institute a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Monitor work areas that expose employees to airborne concentrations at or above the action level (Sec. 2). Whenever production, process, control equipment, personnel, or work practices change, institute new monitoring. **Other Precautions:** Medical surveillance is required for all employees possibly exposed at or above the action level. Provide preplacement medical examination that includes complete medical and work history, complete physical examination that emphasizes respiratory and cardiovascular systems and digestive tract, the respiratory disease standardized questionnaire, a posterior-anterior 14" x 17" chest roentgenogram, and pulmonary function tests [FVC and FEV(1)]. Annual periodic medical examinations shall include all these elements and an abbreviated questionnaire. If it is 10+ years since first asbestos exposure, an individual should have a chest roentogram: every 5 years (ages 15 to 35), every 2 years (ages 35 to 45), every year (age 45+). Within 30 days of employment termination, an individual should receive a periodic medical examination with the elements listed above. Keep medical surveillance records for duration of employment, plus 30 years.

Transportation Data (49 CFR 172.101, .102)
DOT Shipping Name: Asbestos
DOT Hazard Class: ORM-C
ID No.: -
DOT Label: None
DOT Packaging Exceptions: 173.1090
DOT Packaging Requirements: 173.1090
Other Requirements: Stow and handle to avoid airborne particle
IMO Shipping Name: Asbestos, blue; asbestos, white
IMO Hazard Class: 9
ID No.: UN2212, UN2590
IMO Label: None
IMDG Packaging Group: II, III

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

***MSDS Collection* References:** 2-4, 6, 12, 14, 20, 26, 32, 38, 73, 89, 100, 101, 103, 124, 126, 127, 132, 133, 136, 138-140, 142, 143, 146, 148, 152, 153, 156-158
Prepared by: MJ Allison, BS; **Industrial Hygiene Review:** DJ Wilson, CIH; **Medical Review:** MJ Upfal, MD, MPH; **Edited by:** JR Stuart, MS

MATERIAL SAFETY DATA SHEET

CAST BOOSTERS

SECTION I — **Issued by the Safety and Compliance Dept.**

AUSTIN POWDER COMPANY
25800 SCIENCE PARK DRIVE
CLEVELAND, OHIO 44122
EMERGENCY PHONE
DAY 216-464-2400
NIGHT 216-464-2407

TRADE NAME AND SYNONYMS
ACP Boosters: Orange Cap, Red Cap, Black Cap, Brown Cap Green Cap, Purple Cap, White Cap, Gray Cap, etc. NDS Boosters, ADP Boosters, Gold Nugget, Silver Nugget, Diamond Nugget, DES SERIES, DES Pentolite Charges, Rock Crushers, 90 Gram,150 Gram, DES Shaped Charges, Prime Gel*, Renforcatuers, HDP 150, HDP 400, HDP 400LP, HDP 450, Doubledet and Ringprime

SECTION II HAZARDOUS INGREDIENTS

Formulated with TNT and an explosive sensitizer such as PETN, RDX and/or HMX.

TNT, Trinitrotoluene, $C_7H_5N_3O_6$,	CAS No. 118-96-7	30% to 80% TNT
PETN, Pentaerythritol tetranitrate, $C_5H_8N_4O_{12}$,	CAS No. 78-11-5	20% to 70% PETN, RDX, and/or HMX.
HMX, Cyclotetramethylene tetranitramine, Octogen, $C_4H_8N_8O_8$,	CAS No. 261-41-0	
RDX, Cyclotrimethylene trinitramine, Cyclonite, $C_3H_6N_6O_6$,	CAS No. 121-82-4	
Aluminum, AL	CAS No. 7429-90-5	0% to 20% Aluminum
Pentolite is a 50/50 mixture of PETN and TNT.	CAS No. 8066-33-9	

SECTION III PHYSICAL DATA

BOILING POINT	Decomposes	VAPOR PRESSURE (mm Hg)	Negligible at 20°C
SPECIFIC GRAVITY (H_2O = 1)	1.65	VAPOR DENSITY (Air = 1)	N/A
PERCENT VOLATILE BY VOL. (%)	N/A	EVAPORATION RATE:	N/A
SOLUBILITY IN WATER:	0.15%		

APPEARANCE AND ODOR: Solid yellow-buff cast crystalline material. No odor.

SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT:	N/A
FLAMMABLE LIMITS:	N/A
EXTINGUISHING MEDIA:	See below
SPECIAL FIRE FIGHTING PROCEDURES:	Do not fight fires. Withdraw personnel immediately . Allow fire to burn itself out. Avoid toxic fumes from fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	May explode when subjected to fire or shock.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: ACGIH: TNT-Skin, 0.1 MG/M^3 PETN-None RDX-Skin, 1.5 MG/M^3 AL-10MG/M^3
OSHA : TNT-Skin, 1.5 MG/M^3 PETN-None RDX-None AL-15MG/M^3

EFFECTS OF OVEREXPOSURE: TNT ingestion may cause headache, weakness, anemia, or liver damage. Excessive skin contact may cause dermatitis and sensitization. PETN is a vasodilator. Ingestion of RDX may cause nervous system disorders or epiliptiform seizures.

EMERGENCY AND FIRST AID PROCEDURES:

FUMES: Remove to fresh air.

IF INGESTED: Obtain medical attention immediately.

MATERIAL SAFETY DATA SHEET

CAST BOOSTERS

SECTION VI REACTIVITY DATA **Issued by the Safety and Compliance Dept.**

STABILITY: Stable under normal conditions. May explode when subjected to fire shock or friction.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid contact with strong acids or alkalies. Do not exceed 150°F (66°C).

HAZARDOUS DECOMPOSITION PRODUCTS: Gaseous Nitrogen Oxides and Carbon Oxides

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Sweep up and dispose of all spilled material immediately. Do not permit smoking or open flames near spill site.

WASTE DISPOSAL METHOD: Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Austin Powder for recommendations and assistance. This material may become a hazardous waste under certain conditions and must be collected, labeled and disposed of per state and federal hazardous waste regulations.

TRANSPORTATION EMERGENCIES involving spills, leaks, fires or exposures in the United States: **CALL CHEMTREC:** 1-800-424-9300. For emergency calls originating outside the U. S. dial the U. S. access number followed by: 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION:	Avoid breathing fumes from detonation.
VENTILATION:	Not required under normal conditions.
PROTECTIVE GLOVES:	Not required for normal handling of boosters.
EYE PROTECTION:	Not required under normal conditions.

SECTION IX SPECIAL PRECAUTIONS

COMPLY WITH "ALWAYS AND NEVER" AS ADOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES. TRANSPORTATION, STORAGE AND USE MUST COMPLY WITH OSHA SAFETY AND HEALTH STANDARDS 29CFR1910.109, APPLICABLE MSHA REGULATIONS, THE DOT AND HAZARDOUS MATERIALS REGULATIONS BATF REQUIREMENTS AND STATE AND LOCAL TRANSPORTATION, STORAGE AND USE REGULATIONS AND ORDINANCES.

DOT or IMDG proper shipping description: Boosters, Without Detonator, 1.1D, UN 0042, PG II

None of the components are listed in the 1987 IARC Monographs, Group 1, 2A, or 2B as a known, probable or possible carcinogen, nor are they listed in the NTP annual report on carcinogens.

*Prime Gel contains both a Cast Booster and Hydromite.
Also see the Hydromite MSDS.

Composition C-4

TYPE: Non-Initiating

USE: Plastic Demolition Explosive

CLASSIFICATION: MILITARY 1.1 SCG D

DOT: Class A

PHYSICAL

DENSITY: 1.59 gm/cc
COLOR: Light Brown
MELTING POINT:
SOLUBILITY: Soluble in Acetone

CHEMICAL

MOLECULAR WEIGHT:
FORMULA: RDX 91%
Plasticizer 9%

SENSITIVITY AND OTHER CHARACTERISTICS

IMPACT SENSITIVITY (2 Kg. Weight)

Picatinny Arsenal - 19 in.
Bureau of Mines - 100+ cm

FRICTION PENDULUM TEST

Steel Shoe - No Reaction
Fibre Shoe - No Reaction

FRICTION (8 Ft/Sec.)

RIFLE BULLET IMPACT TEST
20% Burns

STATIC SENSITIVITY:

EXPLOSION TEMPERATURE (5 Sec) 290°C

INITIATION: Lead Azide 0.20 gm.
Tetryl 0.10 gm.

STABILITY

International Heat Test:
(100°C) 0.13%
Vacuum Stability:
(100°C) 0.26 cc.

BRISANCE (Sand Test in gm.): 55.7 gm.

DETONATION VELOCITY: 8040 m/sec.

SPECIAL HEALTH HAZARDS: Can be absorbed by ingestion and inhalation, but does not penetrate the skin. Can cause headache, insomnia, dizziness, restlessness, and convulsions resulting from central nervous system stimulation. The convulsions resemble grand mal or epileptic seizures. It does not exhibit pharmacological effects similar to nitrates or nitrites. No effects from skin or eye contacts have been reported. Ventilation should be provided to reduce the inhalation hazard. Employees should be cautioned of the effects from accidental or intentional ingestion. Oxides of nitrogen and carbon will be present in the combustion products. Lung irritation may be produced either promptly or delayed a few hours after exposure.

SHIPPING AND HANDLING:

MSDS
DEEP WOODS OFF

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 668986
PRODUCT NAME(S): DEEP WOODS OFF PUMP SPRAY

MATERIAL SAFETY DATA SHEET

WHMIS Serial No: 8 Issued: 1993-04-26
Supersedes: 1993-01-27

PRODUCT IDENTIFICATION

PRODUCT NAME: DEEP WOODS OFF! PUMP SPRAY

PRODUCT USE: HOUSEHOLD INSECT REPELLANT

HMIS RATING
HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 0
SPECIAL WARNING:

INGREDIENT INFORMATION

WEIGHT %	CAS	INGREDIENT
25	134-62-3	DIETHYLTOLUAMIDE LD50: 1,950 MG/KG (ORAL - RAT) EXP. LIMITS: NOT ESTABLISHED
15 - 40	64-17-5	ETHANOL LD50: 7,060 MG/KG (ORAL - RAT) EXP. LIMITS: 1000 PPM (TLV-TWA ACGIH)

PHYSICAL DATA
PHYSICAL STATE: LIQUID
ODOUR/APPEARANCE: CLEAR, COLOURLESS LIQUID WITH CHARACTERISTIC FLORAL ODOUR
ODOUR THRESHOLD: NOT AVAILABLE
SPECIFIC GRAVITY: 0.923 (WATER = 1.0)
VAPOUR PRESSURE (MM HG): NOT AVAILABLE
VAPOUR DENSITY (AIR=1.0): NOT AVAILABLE
CARCINOGENICITY : NONE KNOWN
WATER SOLUBILITY: DISPERSIBLE
EVAPORATION RATE: NOT AVAILABLE (BUTYL ACETATE = 1.0)
BOILING POINT (DEG C): 75
FREEZING POINT (DEG C): NOT AVAILABLE PH: 7.5
COEF. WATER/OIL: NOT AVAIL.

FIRE AND EXPLOSION INFORMATION
FLASH POINT (DEG C): 25 (TCC)
FLAMMABLE LIMITS: NOT AVAILABLE
AUTO-IGNITION TEMP (DEG C): NOT APPLICABLE
FLAMMABILITY CLASSIFICATION : FLAMMABLE LIQUID
EXTINGUISHING MEDIA : CARBON DIOXIDE, FOAM, DRY CHEMICAL, "ALCOHOL" FOAM.
SPECIAL FIREFIGHTING PROCEDURES : NORMAL FIRE FIGHTING PROCEDURE MAY BE USED. COOL AND USE CAUTION WHEN APPROACHING CONTAINERS.
FIRE FIGHTERS SHOULD WEAR SCBA AND PROTECTIVE CLOTHING.
EXPLOSION DATA : RISK OF EXPLOSION BY FIRE OR OTHER SOURCES OF IGNITION.

TOXICOLOGICAL AND FIRST AID DATA
LD50 : 5,400 MG/KG (ORAL-MALE RAT), 2,510 MG/KG (ORAL-FEMALE RAT)
SOURCE: RALTECH SCIENTIFIC SERVICES REPORT 795400 LC50 : NOT AVAILABLE
PRIMARY ROUTE OF ENTRY :
EYE CONTACT, INHALATION, INGESTION.
EFFECTS OF ACUTE EXPOSURE :
MAY CAUSE EYE IRRITATION.
MAY DRY OR DEFAT SKIN ON PROLONGED CONTACT.
INHALATION MAY CAUSE DIZZINESS AND DROWSINESS.
EFFECTS OF CHRONIC EXPOSURE :
NOT AVAILABLE
IRRITANCY OF PRODUCT : MODERATELY IRRITATING TO EYES.
MILDLY IRRITATING TO SKIN ON PROLONGED CONTACT.
SENSITIZATION : NONE KNOWN

REPRODUCTIVE TOXICITY : NONE KNOWN

TERATOGENICITY : NONE KNOWN
MUTAGENICITY :NONE KNOWN

FIRST AID PROCEDURES

EYE CONTACT : FLUSH IMMEDIATELY WITH WATER FOR 15 MINUTES.
IF IRRITATION OCCURS, GET MEDICAL ATTENTION.
SKIN CONTACT : NO SPECIAL REQUIREMENT FOR NORMAL USE.
IF IRRITATION OCCURS, GET MEDICAL ATTENTION.
INHALATION : REMOVE TO FRESH AIR.
ADMINISTER ARTIFICIALRESPIRATION, IF NEEDED.
INGESTION : DILUTE WITH 1 - 2 GLASSES OF MILK. SEEK MEDICAL AID.

REACTIVITY DATA

STABILITY : STABLE
CONDITIONS TO AVOID : EXCESSIVE HEAT.
INCOMPATIBILITY : AVOID PLASTIC, RUBBER AND OXIDIZERS.
HAZARDOUS DECOMPOSITION PRODUCTS : WHEN EXPOSED TO FIRE, PRODUCES NORMAL COMBUSTION PRODUCTS.
HAZARDOUS POLYMERIZATION : WILL NOT OCCUR.

CONDITIONS TO AVOID :NOT APPLICABLE

PREVENTIVE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED :
ELIMINATE ALL SOURCES OF IGNITION.
ABSORB WITH OIL-DRI. SWEEP/SCRAPE UP. CONTAINERIZE IN STEEL DRUMS.
WASTE DISPOSAL INFORMATION :
KEEP STORAGE CONTAINERS WELL SEALED. OBSERVE ALL FEDERAL, STATE AND MUNICIPAL REGULATIONS FOR IGNITABLE WASTE.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION : NOT REQUIRED FOR NORMAL USE.
VENTILATION : ROOM VENTILATION SHOULD BE SUFFICIENT.
PROTECTIVE GLOVES : NOT REQUIRED FOR NORMAL USE. GROSS CONTACT POSSIBLE (E.G. SPILLS): NEOPRENE GLOVE.
EYE PROTECTION : SAFETY GLASSES.
OTHER PROTECTIVE MEASURES :

SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING : KEEP AWAY FROM SOURCES OF IGNITION.
KEEP AWAY FROM HEAT.
OTHER HANDLING AND STORAGE CONDITIONS : BOND AND GROUND DURING MATERIAL TRANSFER.
DO NOT TRANSFER WITH AIR PRESSURE.
KEEP CONTAINER WELL CLOSED WHEN NOT IN USE.

ADDITIONAL INFORMATION

SHIPPING NAME: ETHANOL SOLUTION
TDG CLASSIFICATION: 3.3
PIN/NIP: 1170
PACKING GROUP:
PLACARD: FLAMMABLE LIQUID
EXEMPTION NAME: CONSUMER COMMODITY
HMIS CLASSIFICATION : REGULATED UNDER P.C.P. ACT NO. 22258

MATERIAL SAFETY DATA SHEET

ELECTRIC DETONATORS
NON ELECTRIC DETONATORS

DATE SEPTEMBER 1998 **MSDS NO. ED-1**

SECTION I **Issued by the Safety and Compliance Dept.**

AUSTIN POWDER COMPANY
25800 SCIENCE PARK DRIVE
CLEVELAND, OHIO 44122
EMERGENCY PHONE
DAY 216-464-2400
NIGHT 216-464-2407

TRADE NAME AND SYNONYMS
Coal* Star, Rock* Star, Time* Star, Coal Mine Delays, Seismic* Star, Twin* Star Detonators, 3-D Star, Seismic Detonators and Shock*Star; In-Hole Delays, Surface Delay Connectors, Quick-Relay Connectors, Dual Delays, Shorty STD (Shock Tube with Detonators) and MS Connector.

Electric Blasting Caps

SECTION II HAZARDOUS INGREDIENTS

Explosive components are PETN (possibly TNT) and lead compounds sealed in a metal shell.

PETN, Pentaerythritol Tetranitrate,	CAS No. 78-11-5
Lead Azide, Pb $(N_3)_2$,	CAS No. 13424-46-9
Lead Styphnate, Lead Trinitroresorcinate, $C_6H_3N_3O_9Pb$	CAS No. 15245-44-0
TNT, Trinitrotoluene, $C_7H_5N_3O_6$	CAS No. 118-96-7 (May be included in some detonators)

SECTION III PHYSICAL DATA

BOILING POINT	N/A	VAPOR PRESSURE (mm Hg)	N/A
SPECIFIC GRAVITY (H_2O = 1)	N/A	VAPOR DENSITY (Air = 1)	N/A
PERCENT VOLATILE BY VOL. (%)	N/A	EVAPORATION RATE:	N/A
SOLUBILITY IN WATER:	Insoluble		

APPEARANCE AND ODOR: Aluminum or copper shells with attached PVC or polyethyene coated copper or iron leg wires. No odor.

SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT:	N/A
FLAMMABLE LIMITS:	N/A
EXTINGUISHING MEDIA:	See below
SPECIAL FIREFIGHTING PROCEDURES:	Do not fight fire. Withdraw personnel immediately . Allow fire to burn itself out.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	May explode when subjected to flame, heat, impact, friction, electric current, electrostatic or radio frequency energy. Do not exceed 150°F (66°C). Avoid toxic fumes from fire.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: ACGIH: 0.05 mg/M^3 TWA, lead, elemental, and inorganic compounds, as Pb.
OSHA : 50 µg/M^3 PEL as Pb. For additional information, see 29 CFR 1910.1025

EFFECTS OF OVEREXPOSURE: None likely when safe blasting practices are employed.

EMERGENCY AND FIRST AID PROCEDURES: Improper handling or misuse may cause detonation resulting in injuries from shrapnel. Lead and lead compounds are listed in the 1987 IARC Monographs as possible human carcinogens (Group 2B). Lead is not listed in the NTP annual report on carcinogens.

MATERIAL SAFETY DATA SHEET

ELECTRIC DETONATORS
NON ELECTRIC DETONATORS

SECTION VI REACTIVITY DATA

Issued by the Safety and Compliance Dept.

STABILITY: May explode when subjected to flame, heat, impact, friction, electric currents, electrostatic or radio frequency energy. Avoid static charge build up. Keep lead wires shunted until wiring into circuit.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid contact with acids or alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS: Gaseous Nitrogen Oxides, Carbon Oxides, and lead fumes.

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Pick up containers or units by hand. Avoid conditions affecting stability. DO NOT use damaged detonators.

WASTE DISPOSAL METHOD: Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Austin Powder for recommendations and assistance. This material may become a hazardous waste under certain conditions and must be collected, labeled and disposed of per state and federal hazardous waste regulations.

TRANSPORTATION EMERGENCIES involving spills, leaks, fires or exposures in the United States: **CALL CHEMTREC:** 1-800-424-9300. For emergency calls originating outside the U. S. dial the U. S. access number followed by: 1-703-527-3887. All calls are recorded.

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION:	Avoid breathing fumes from detonation.
VENTILATION:	Not required.
PROTECTIVE GLOVES:	Not required.
EYE PROTECTION:	Not required.

SECTION IX SPECIAL PRECAUTIONS

COMPLY WITH "ALWAYS AND NEVER" AS ADOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES. TRANSPORTATION, STORAGE AND USE MUST COMPLY WITH OSHA SAFETY AND HEALTH STANDARDS 29CFR1910.109, APPLICABLE MSHA REGULATIONS, THE DOT AND HAZARDOUS MATERIALS REGULATIONS BATF REQUIREMENTS AND STATE AND LOCAL TRANSPORTATION, STORAGE AND USE REGULATIONS AND ORDINANCES.

THESE DETONATORS MAY BE SHIPPED UNDER ONE OF THE FOLLOWING DOT CLASSIFICATIONS:

DOT or IMDG proper shipping description:

Detonators, Electric, 1.4B, UN0255, PGII
Detonators, Electric, 1.1B, UN0030, PGII
Detonator Assemblies, Non-Electric, 1.1B, UN0360, PGII
Detonator Assemblies, Non-Electric, 1.4B, UN0361, PGII
Articles, explosive, n.o.s. 1.4S, UN0349, PGII

Consult IME Safety Library Publication No. 20, SAFETY GUIDE FOR THE PREVENTION OF RADIO FREQUENCY RADIATION HAZARDS IN THE USE OF ELECTRIC BLASTING CAPS, and Publication No. 22, RECOMMENDATIONS FOR THE SAFE TRANSPORTATION OF DETONATORS IN A VEHICLE WITH CERTAIN OTHER EXPLOSIVE MATERIALS.

MATERIAL SAFETY DATA SHEET

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

CHS Inc.
P.O. Box 64089
Mail station 525
St. Paul, MN 55164-0089

Transportation Emergency (CHEMTREC): 1-800-424-9300
Technical Information: 1-651-355-8443
MSDS Information: 1-651-355-8438

PRODUCT NAME: No. 1 DIESEL FUEL

MSDS: 0143-M2A0 - Rev. D (02/08/07)

COMMON NAME: No. 1 Distillate Fuel, No. 1 High Sulfur Diesel (Dyed)

No. 1 Low Sulfur Diesel (Dyed), No. 1 Ultra Low Sulfur Diesel (Dyed/Undyed)

CHEMICAL FORMULA: Mixture

CHEMICAL NAME: Petroleum Distillate

CHEMICAL FAMILY: A mixture of Paraffinic, Olefinic, Naphthenic, and Aromatic Hydrocarbon.

Section 2 - COMPOSITION AND INFORMATION ON INGREDIENTS

INGREDIENTS	PERCENTAGES (by weight)	PEL (OSHA) TWA	TLV (ACGIH) TWA	CAS #
Petroleum Distillates	0-100	N/D	200 ppm	8008-20-6
Biphenyl	0.5-1.5	0.2 ppm		92-52-4
Naphthalene	0-3	10 ppm		91-20-3
Xylene	0-2.5	100 ppm		1330-20-7
1,2,4-Trimethylbenzene	0-2		25 ppm	95-63-6

Note: The National Institute for Occupational Safety and Health has published a Recommended Exposure Limit (REL) of 100 mg/m^3 TWA or » 14 ppm based on an average molecular weight of 170 for kerosene like factions.
(TWA) - Time Weighted Average is the employee's average airborne exposure in any 8-hour work shift of a 40-hour work week which shall not be exceeded.
(STEL) - Short Term Exposure Limit is the employee's 15-minute time weighted average exposure which shall not be exceeded at any time during a work day unless another time limit is specified.

Section 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

A clear to light yellow liquid with a hydrocarbon odor. May contain dye.

OSHA HAZARD CLASSES

Based on OSHA definitions, the following ingredients in this product are hazardous. The OSHA physical and health hazard categories are shown below.

Petroleum Hydrocarbon - Combustible, toxic (moderate), target organ (skin).
1,2,4-Trimethylbenzene - Flammable, toxic, irritant, target organ (Central Nervous System, blood).

POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY: Eye Contact, Dermal, Inhalation, Ingestion.

ACUTE EFFECTS OF OVEREXPOSURE:

Eyes - Minor irritation

Skin - Slight irritation

Inhalation - Vapors may cause dizziness or asphyxiation

Ingestion - Central nervous system depression, peripheral nervous system depression, narcosis, asphyxiation, gastrointestinal disturbances. Aspiration of vomitus can cause serious pneumonitis, particularly in young children.

CHRONIC EFFECTS OF OVEREXPOSURE: Dermatitis from chronic exposure. Products of similar composition were tested on laboratory animals, and weak to moderately positive results were found in mouse skin cancer studies, mixed and inconsistent results were found in mutagenicity studies, and negative results were found in rat teratology studies. There is no direct evidence that this material causes skin cancer in humans. This material is not listed as a carcinogen by NTP, IARC, or OSHA.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: May aggravate pre-existing dermatitis or respiratory illness.

CARCINOGENICITY:	Petroleum Hydrocarbon	**NTP:** No	**IARC:** No	**OSHA:** No
	1,2,4-Trimethylbenzene	**NTP:** No	**IARC:** No	**OSHA:** No

Section 4 - FIRST AID MEASURES

EMERGENCY AND FIRST AID PROCEDURES:

Eye Contact: If material contacts the eye, flush thoroughly with water for at least 15 minutes, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention.

Skin Contact: Remove contaminated clothing. Wash affected areas with soap and water.

Inhalation: Move person to fresh air. If a large amount has been inhaled, keep victim warm and get medical attention. Begin rescue breathing procedures if not breathing.

Ingestion: Do **NOT** induce vomiting. Get medical attention immediately. If spontaneous vomiting occurs, lower victim's head in an effort to prevent vomits from entering the lungs. Never give anything by mouth to an unconscious person.

Section 5 - FIRE - FIGHTING MEASURES

FLASH POINT: 100-150°F (38-66°C) TCC **AUTO IGNITION TEMP:** 410° F

FLAMMABLE LIMITS IN AIR	**LOWER**	**UPPER**
% BY VOLUME	0.7	5.0

EXTINGUISHING MEDIA: Dry Chemical, Foam, Carbon Dioxide (CO_2), Water (fog pattern)

SPECIAL FIRE FIGHTING PROCEDURES: Water may be ineffective on flames, but should be used to keep fire-exposed containers cool. Water or foam sprayed into container of hot burning product could cause frothing and endanger fire fighters. Large fires, such as tank fires, should be fought with caution. If possible, pump the contents from the tank and keep adjoining structures cool with water. Avoid spreading burning liquid with water used for cooling purposes. Do not flush down public sewers. Avoid inhalation of vapors. Fire fighters should wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Vapors are heavier than air and may travel along the ground to a source of ignition (pilot light, heater, electric motor) some distance away. Containers, drums (even empty) can explode when heat (welding, cutting, etc.) is applied.

HAZARD RATINGS:	**NFPA 704:**	Health 1	Fire 2	Reactivity 0
	HMIS:	Health 1	Fire 2	Reactivity 0

Section 6 - ACCIDENTAL RELEASE MEASURES

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Notify emergency response personnel as appropriate. If facility or operation has an "Oil or Hazardous Substance Contingency Plan", "Spill Prevention Control & Countermeasures (SPCC) Plan" or equivalent, activate its procedures. Prohibit persons not wearing protective equipment from entering the area. Stop leak at source, contain spill to prevent spreading. Small spills can be removed with inert absorbent. Dike areas of large spill to prevent runoff to sewers, streams, etc. Ventilate area. Avoid breathing vapors.

Section 7 - HANDLING AND STORAGE

HANDLING AND STORAGE: Transport, handle and store in accordance with OSHA Regulation 29 CFR 1910.106, and applicable D.O.T. Regulation. Caution: Misuse of empty containers can be hazardous. Empty containers can be hazardous since emptied containers retain product residue (vapor, liquid, and/or solid). Cutting or welding empty containers might cause fire, explosion or toxic fumes from residues.

Section 8 - EXPOSURE CONTROL - PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide adequate local or dilution ventilation to keep vapors below permissible concentrations.

RESPIRATORY EQUIPMENT: Personnel should never enter areas of high concentrations without proper respiratory protection. If exposure limits for product or components are exceeded, NIOSH-approved respiratory protection equipment should be worn. Proper selection of respirators should be determined by adequately trained personnel, based on the contaminants, the degree of potential exposure and published respiratory protection factors. Self-contained breathing apparatus or supplied air respiratory protection required for entry into tanks, vessels, or other confined spaces containing kerosene.

EYE PROTECTION: Chemical type goggles or face shield where contact with liquid or mist may occur.

PROTECTIVE CLOTHING: Wear impervious clothing and gloves when contact with skin may occur.

OTHER (SAFETY SHOWERS, EYE WASH STATIONS, ETC.): Water should be available for flushing and washing when exposure exists.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: A clear to light yellow liquid, may contain red dye.

ODOR: Hydrocarbon odor.

BOILING POINT: 340°F - 570° F

SPECIFIC GRAVITY (water=1): 0.82

VAPOR PRESSURE: < 50 mmHg @ 100°F

VAPOR DENSITY (air=1): >1

SOLUBLE IN WATER: Insoluble

EVAPORATION RATE (ether=1): >1

pH: N/D

Section 10 - STABILITY AND REACTIVITY

STABILITY:

STABLE **X**
UNSTABLE ___

INCOMPATIBILITY:

CONDITIONS TO AVOID: Heat, flame, all ignition sources and static electricity.
MATERIALS TO AVOID: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, and other petroleum decomposition products (hydrocarbons).

HAZARDOUS POLYMERIZATION: Has not been reported to occur under normal temperatures and pressures.

Section 11 - TOXICOLOGY INFORMATION

Note: CHS has not conducted specific toxicity tests on this product. Our hazard evaluation is based from similar ingredients, technical literature, and/or professional experience.

Section 12 - ECOLOGICAL INFORMATION

Note: CHS has not conducted specific ecological tests on this product.

Section 13 - DISPOSAL CONSIDERATION

WASTE DISPOSAL PROCEDURES: Recycle as much of the recoverable product as possible. Do not flush to drain or storm sewer or otherwise release to the environment. Dispose of non-recyclable material according to federal, state and local regulations.

Section 14 - TRANSPORTATION

DOT PROPER SHIPPING NAME: Fuel 0il #1

DOT HAZARD CLASS: Flammable Liquid

DOT IDENTIFICATION NUMBER: NA 1993

DOT EMER. RESPONSE GUIDE NO.: 128 (Formerly #27)

Proper Shipping Name-**Fuel Oil #1**; Hazard Class- **3**; UN/NA Identification #- **NA 1993**; **Packing Group III**; Placard- **FLAMMABLE LIQUID**.

Section 15 - REGULATORY INFORMATION

This product contains the following toxic chemicals subject to the reporting requirements of SARA Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 and of 40 CFR 372:

CAS Number	Chemical Name	Percent by Weight
95-63-6	1,2,4-Trimethylbenzene	0-2%
91-20-3	Naphthalene	0-3%

SARA SECTION 311-312 HAZARD CATEGORIES (40 CFR 370.2):

FIRE: Yes **SUDDEN RELEASE OF PRESSURE:** No **REACTIVE:** No **ACUTE:** Yes **CHRONIC:** Yes

Section 16 - OTHER INFORMATION

Prepared By: Hue Lam

Date: February 08, 2007

Title: EHS Compliance Specialist

Supersedes: December 24, 2003

Reason for Issue: Periodic review and update

MSDS

Fire Extinguishers

***** IDENTIFICATION *****

MSDS RECORD NUMBER : 503384
PRODUCT NAME(S): General Triplex Dry Chemical

***** MATERIAL SAFETY DATA *****

Material Safety Data SheetU.S. Department of Labor May be used to comply with Occupational Safety and Health OSHA's Hazard Communication Administration Standard, 29 CFR 1910.1200.
(Non-Mandatory Form)
Standard must be consulted for Form Approved specific requirements.
OMB No. 1218-0072

Section II - Hazardous Ingredients/Identity Information

Hazardous Components OSHA PEL ACGIH TLV Other Limits (Specific Chemical Identity; Recommended % (optional)
Common Name(s))

Not Applicable - Dry Chemical Fire Extinguishing Agent - Monoammonium Phosphate Base Contains No Hazardous Ingredients

Section III - Physical/Chemical Characteristics

Boiling Point NA
Specific Gravity (H2O = 1) 1.8
Vapor Pressure (mm Hg.) NA
Melting Point NA
Vapor Density (AIR = 1) NA
Evaporation Rate NA
(Butyl Acetate = 1)
Solubility in Water
Water repellant. 94% soluble.
Appearance and Odor Fine yellow Powder

Section IV - Fire and Explosion Hazard Data
Flash Point (Method Used) NA
Flammable Limits NA
LEL NA
UEL NA
Extinguishing Media NA - Fire Extinguishing agent
Special Fire Fighting Procedures
Unusual Fire and Explosion Hazards

Section V - Reactivity Data
Stability Unstable [ ] Conditions to Avoid
Stable [X]

Incompatibility (Materials to Avoid)
Do not mix with bicarbonate base fire extinguishing agents.

Hazardous Decomposition or Byproducts
Decomposes to ammonia and phosphoric acid at high temperature.

Hazardous Conditions to Avoid
May Occur [ ]
Polymerization Will Not Occur [X]

Section VI - Health Hazard Data

Route(s) of Entry: NA

Inhalation?	Skin?	Ingestion?
NA	NA	NA

Health Hazards (Acute and Chronic) NA

Carcinogenicity: NA NTP? IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure NA

Medical Conditions Generally Aggravated by Exposure NA

Emergency and First Aid Procedures
Wash from eyes with warm water.

Section VII - Precautions for Safe Handling and Use

MSDS
Fire Extinguishers

Steps to Be Taken in Case Material is Released or Spilled
Clean up in normal manner. Use vacuum to avoid causing dust.

Waste Disposal Method
Dispose of in normal manner. Use closed container to prevent dust.

Precautions to Be Taken in Handling and Storing
Protect from moisture

Other Precautions

Section VIII - Control Measures

Respiratory Protection (Specify Type)
Use particle mask, 3M 8500 Non-Toxic, when handling
Ventilation
Local Exhaust Special
Use to remove dust
Mechanical (General) Other

Protective Gloves Not needed Eye Protection Not needed

Other Protective Clothing or Equipment
Not needed.

Work/Hygienic Practices
After handling, wash exposed skin with warm water and soap.

MSDS

Fire Extinguishers

*** ***

*** M S D S ***

*** ***

*** Canadian Centre for Occupational Health and Safety ***

*** * * * * * * * * * * * * Issue : 94-4 (November, 1994) ***

***** IDENTIFICATION *****

MSDS RECORD NUMBER : 503383
PRODUCT NAME(S) : General "Quick-Aid" Dry Chemical
DATE OF MSDS : 1986-05-06

***** MANUFACTURER INFORMATION *****

MANUFACTURER : General Fire Extinguisher Corporation
ADDRESS : 1685 Shermer Road
Northbrook Illinois
U.S.A. 60062
Telephone: 312-272-7500 (Information)
EMERGENCY TELEPHONE NO. : 312-729-8800

***** MATERIAL SAFETY DATA *****

Material Safety Data Sheet U.S. Department of Labor
May be used to comply with Occupational Safety and Health
OSHA's Hazard Communication Administration
Standard, 29 CFR 1910.1200. (Non-Mandatory Form)
Standard must be consulted for Form Approved
specific requirements. OMB No. 1218-0072

IDENTITY (As Used on Label and List)

Note: Blank spaces are not permitted.
General "Quick-Aid" Dry Chemical If any item is not applicable, or no
information is available, the space
must be marked to indicate that.

Section I

Date Prepared May 6, 1986
Signature of Preparer (optional) William R. Warnock

Section II - Hazardous Ingredients/Identity Information

Hazardous Components OSHA PEL ACGIH TLV Other Limits
(Specific Chemical Identity; Recommended % (optional)
Common Name(s))

Not Applicable - Dry Chemical Fire Extinguishing Agent - Sodium Bicarbonate Base.
Contains no hazardous ingredients.

Section III - Physical/Chemical Characteristics

Boiling Point NA Specific Gravity (H2O = 1) 2.16
Vapor Pressure (mm Hg.) NA Melting Point NA

MSDS
Fire Extinguishers

Vapor Density (AIR = 1) NA
Evaporation Rate NA
(Butyl Acetate = 1)
Solubility in Water Water repellant. 98% soluble
Appearance and Odor Fine white powder

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used) NA
Flammable Limits LEL UEL
NA NA
NA
Extinguishing Media NA - Fire Extinguishing agent
Special Fire Fighting Procedures NA
Unusual Fire and Explosion Hazards NA

Section V - Reactivity Data

Stability Unstable [ ] Conditions to Avoid
Stable [X]

Incompatibility (Materials to Avoid)
Do not mix with ammonium phosphate base fire extinguishing agents.

Hazardous Decomposition or Byproducts
Decomposes to sodium carbonate, carbon dioxide and water at high temperatures.

Hazardous May Occur [ ] Conditions to Avoid
Polymerization Will Not Occur [X]

Section VI - Health Hazard Data

Route(s) of Entry: Inhalation? Skin? Ingestion?
NA NA NA
NA

Health Hazards (Acute and Chronic) NA

Carcinogenicity: NA NTP? IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure NA

Medical Conditions Generally Aggravated by Exposure NA

Emergency and First Aid Procedures
Wash from eyes with warm water.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled
Clean up in normal manner. Use vacuum to avoid causing dust.

Waste Disposal Method
Dispose of in normal manner. Use closed container to prevent dust.

Precautions to Be Taken in Handling and Storing
Protect from moisture.

Other Precautions

Section VIII - Control Measures

Respiratory Protection (Specify Type)

Use particle mask, 3M 8500 Non-Toxic, when handling

Ventilation **Local Exhaust** **Special** **Use to remove dust** **Mechanical (General)** **Other**

Not needed.

Work/Hygienic Practices

After handling, wash exposed skin with warm water and soap.

Protective Gloves **Not needed** **Eye Protection** **Not needed**

Other Protective Clothing or Equipment

MSDS

Fire Extinguishers

*** ***

*** M S D S ***

*** ***

*** Canadian Centre for Occupational Health and Safety ***

*** * * * * * * * * * * * * Issue : 94-4 (November, 1994) ***

***** IDENTIFICATION *****

MSDS RECORD NUMBER : 503382
PRODUCT NAME(S) : General Purple K Dry Chemical
DATE OF MSDS : 1986-05-06

***** MANUFACTURER INFORMATION *****

MANUFACTURER : General Fire Extinguisher Corporation
ADDRESS : 1685 Shermer Road
Northbrook Illinois
U.S.A. 60062
Telephone: 312-272-7500 (Information)
EMERGENCY TELEPHONE NO. : 312-729-8800

***** MATERIAL SAFETY DATA *****

Material Safety Data Sheet U.S. Department of Labor
May be used to comply with Occupational Safety and Health
OSHA's Hazard Communication Administration
Standard, 29 CFR 1910.1200. (Non-Mandatory Form)
Standard must be consulted for Form Approved
specific requirements. OMB No. 1218-0072

IDENTITY (As Used on Label and List)

Note: Blank spaces are not permitted.
General Purple K Dry Chemical If any item is not applicable, or no
information is available, the space
must be marked to indicate that.

Section I

Date Prepared May 6, 1986
Signature of Preparer (optional) William R. Warnock

Section II - Hazardous Ingredients/Identity Information

Hazardous Components OSHA PEL ACGIH TLV Other Limits
(Specific Chemical Identity; Common Name(s))
Recommended % (optional)

Not Applicable - Dry Chemical Fire Extinguishing Agent - Potassium Bicarbonate Base
Contains no hazardous ingredients.

Section III - Physical/Chemical Characteristics

Boiling Point NA Specific Gravity (H2O = 1) 2.17
Vapor Pressure (mm Hg.) NA Melting Point NA

MSDS

Fire Extinguishers

Vapor Density (AIR = 1) NA
Evaporation Rate NA
(Butyl Acetate = 1)
Solubility in Water Water repellant. 94% soluble
Appearance and Odor Fine purple powder

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used) NA
Flammable Limits LEL UEL
NA NA
NA
Extinguishing Media NA - Fire extinguishing agent
Special Fire Fighting Procedures NA
Unusual Fire and Explosion Hazards NA

Section V - Reactivity Data

Stability Unstable [ ] Conditions to Avoid
Stable [X]

Incompatibility (Materials to Avoid)
Do not mix with ammonium phosphate base fire extinguishing agents.

Hazardous Decomposition or Byproducts
Decomposes to potassium carbonate, carbon dioxide and water at high temperatures.

Hazardous May Occur [ ] Conditions to Avoid
Polymerization Will Not Occur [X]

Section VI - Health Hazard Data

Route(s) of Entry: Inhalation? Skin? Ingestion?
NA NA NA NA

Health Hazards (Acute and Chronic) NA

Carcinogenicity: NA NTP? IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure NA

Medical Conditions Generally Aggravated by Exposure NA

Emergency and First Aid Procedures
Wash from eyes with warm water.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled
Clean up in normal manner. Use vacuum to avoid causing dust.

Waste Disposal Method
Dispose of in normal manner. Use closed container to prevent dust.

Precautions to Be Taken in Handling and Storing
Protect from moisture.

Other Precautions

Section VIII - Control Measures

Respiratory Protection (Specify Type)
Use particle mask 3M 8506 Non-Toxic, when handling.
Ventilation **Local Exhaust** **Special**
Use to remove dust.
Mechanical (General) **Other**

Protective Gloves **Not needed** **Eye Protection** **Not needed**

Other Protective Clothing or Equipment
Not needed.

Work/Hygienic Practices
After handling, wash exposed skin with warm water and soap.

MSDS

Fire Extinguishers

*** ***

*** M S D S ***

*** ***

*** Canadian Centre for Occupational Health and Safety ***

*** * * * * * * * * * * * * Issue : 94-4 (November, 1994) ***

***** IDENTIFICATION *****

MSDS RECORD NUMBER : 500586
PRODUCT NAME(S) : General LS-61 Anti Freeze Charge
DATE OF MSDS : 1990-09

***** MANUFACTURER INFORMATION *****

MANUFACTURER : General Fire Extinguisher Corporation
ADDRESS : 1685 Shermer Road
Northbrook Illinois
U.S.A. 60062
Telephone: 312-272-7500 (Information)
EMERGENCY TELEPHONE NO. : 312-729-8800

***** MATERIAL SAFETY DATA *****

Material Safety Data Sheet U.S. Department of Labor
May be used to comply with Occupational Safety and Health
OSHA's Hazard Communication Standard, Administration
29 CFR 1910.1200. Standard must be (Non-Mandatory Form)
consulted for specific reuqirements. Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
General LS-61 Anti Freeze Charge

Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

Section I

Date Prepared May 6, 1986 Septembre 1990
Signature of Preparer (optional) William R. Warnock

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s)) OSHA PEL ACGIH TLV % (optional)

Anti-Freeze Charge for Pressurized Water
Anti-gel charge d'eau pressurize

Fire Extinguishers Extincteurs d'incendie

Potassium Carbonate Carbone potasse Not Specified Non specifie >50%
Other Limits Recommended:

Potassium Acetate Acetate potasse Not Established Non etabli <50%
Other Limits Recommended:

Section III - Physical/Chemical Characteristics

MSDS
Fire Extinguishers

Boiling Point Point d'ebullition NA
Vapor Pressure (mm Hg) pressure vapeur NA
Vapor Density (AIR = 1) densite vapeur NA
Specific Gravity (H20 = 1) 2.0
Gravite specifique
Melting Point point de fonte NA
Evaporation Rate taux d'evaporation NA
(Butyl Acetate = 1)
Solubility in Water 100%
solubilite d'eau
Appearance and Odor
Off-White granular powder
apparence & odeur poudre granule blanc casse

Section IV - Fire and Explosion Hazard Data
schema feu & explosion hazard

Flash Point (Method Used) NA
point d'etincelles NA

Flammable Limits limite flammable

LEL	UEL
NA	NA NA

Extinguishing Media NA- Fire extinguisher charge
point d'extinction charge d'extincteur d'incendie

Special Fire Fighting Procedures
Procedure speciale pour combattre l'incendie

Unusual Fire and Explosion Hazards
Hazard feu & explosion peu commun

Section V- Reactivity Data

Stability Unstable [ ] Conditions to Avoid
Stabilite instable Conditions a eviter

Stable [X]
Stable

Incompatibility (Materials to Avoid) NA
Incompatibilite materiel a eviter

Hazardous Decomposition or Byproducts
NA
Decomposition hazardeuse sous-produit

Hazardous Polymerization May Occur [ ]
Conditions to Avoid
polymerization a survenir
Conditions a eviter

Will Not Occur [X]
ne surviendra pas.

Section VI - Health Hazard Data Schema hazard sante

Route(s) of Entry	Inhalation?	Skin?	Ingestion?
NA	NA	NA	NA

Health Hazards (Acute and Chronic)
May cause irritation of the skin and eyes.
Peut causer irritation de la peau et des yeux.

Carcinogenicity: NA NTP? IARC Monographs? OSHA Regulated?
cancerigene N/A

Signs and Symptoms of Exposure NA
Signes et symptomes a l'exposition

Medical Conditions Generally Aggravated by Exposure NA
Conditions medical aggrave par exposition

MSDS

Fire Extinguishers

Emergency and First Aid Procedures
Alkaline, Wash from eyes with large volume of warm water.
Laver les yeux avec une large quantite d'eau tiede
Consult doctor. Wash from skin with warm water.
Consulter un medecin. Laver la peau avec eau tiede

Section VII - Precautions for Safe Handling and Use
Precaution pour utilisation secure

Steps to Be Taken in Case Material is Released or Spilled
Sweep up and dispose in normal manner. Flush spill area with water
balayer de maniere normale. Laver la piece avec de l'eau

Waste Disposal Method Methode pour dechets
Dispose in normal manner. Disposer de maniere normale

Precautions to Be Taken in Handling and Storing Protect from moisture.
precaution a prendre pour utilisation proteger de la moissisure

Other Precautions Autres precautions

Section VIII - Control Measures Mesures controle

Respiratory Protection (Specify Type)
Not required. Protection respiratoire non requise

Ventilation Local Exhaust Special Ventilation Mechanical (General) Other

Protective Gloves
Wear rubber gloves when preparing solution.

Eye Protection
Wear goggles or glass with side shields when preparing solution.

Other Protective Clothing or Equipment
Wear long sleeves when preparing solution.

Work/Hygienic Practices
After handling, wash exposed skin thoroughly with warm water.

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 802164
PRODUCT NAME(S) : CFR 40-86-96 RON UNLEADED GASOLINE + 15% MTBE
PRODUCT IDENTIFICATION : PRODUCT CODE R00000573200
DATE OF MSDS : 1994-09-13

*** MATERIAL SAFETY DATA ***

PRIMARY APPLICATION- MOTOR FUEL

SYNONYMS..... : UNLEADED PREMIUM GASOLINE
CAS REGISTRY NO: SEE SEC. 2
CAS NAME..... : NO CLASSIFICATION - MIXTURE
CHEMICAL FAMILY: MOTOR FUEL.

EMERGENCY PHONE NUMBERS (AFTER NORMAL BUSINESS HOURS)
CHEMTREC. 1-800-424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

EXPOSURE GUIDELINES

			OSHA		ACGIH				
COMPONENT/CAS NO.	LO%	HI%	TWA	STEL	TWA	STEL	TWA	STEL	UNIT
LIMITS FOR THE PRODUCT:									
			300	500	300	500			PPM
XYLENE									
1330-20-7	.00	25.00	100	150	100	150			PPM
TERT-BUTYL ALCOHOL									
75-65-0	.00	10.00	100	150	100	150			PPM
MTBE									
1634-04-4	15.00	20.00					100	150	PPM
TOLUENE									
108-88-3	.00	30.00	100	150	50				PPM
BENZENE									
71-43-2	.10	4.90	1	5	10				PPM
LIGHT PETROLEUM DISTILLATE									
8006-61-9	.00	84.00	300	500	300	500			PPM
CUMENE									
98-82-8	.00	1.00	50		50				PPM
ETHYL BENZENE									
100-41-4	.00	5.00	100	125	100	125			PPM
N-HEXANE									
110-54-3	.00	5.00	50		50				PPM
NAPHTHALENE									
91-20-3	.00	5.00	10	15	10	15			PPM
CYCLOHEXANE									
110-82-7	.00	9.00	300		300				PPM
1,2,4-TRIMETHYLBENZENE									
95-63-6	.00	5.00	25		25				PPM

ADDITIONAL EXPOSURE LIMITS
OTHER LIMIT- LIMIT IS DEPENDENT ON BENZENE, SEE SECTION 10

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
DANGER EXTREMELY FLAMMABLE LIQUID & VAPOR - VAPOR MAY CAUSE FLASH FIRE.

HARMFUL IF INHALED. HIGH VAPOR CONCENTRATIONS MAY CAUSE DIZZINESS. MAY CAUSE SKIN IRRITATION.

HARMFUL OR FATAL IF SWALLOWED. PULMONARY ASPIRATION HAZARD-CAN ENTER LUNGS AND CAUSE DAMAGE. CONTAINS MATERIAL
WHICH CAN CAUSE CANCER.

APPEARANCE-- COLORLESS LIQUID. ODOR-- GASOLINE ODOR

POTENTIAL HEALTH EFFECTS

PRIMARY ROUTES OF ENTRY- INHALATION(X) SKIN(X) EYE(X) INGESTION(X)

INHALATION: EXCESSIVE EXPOSURES MAY CAUSE IRRITATION TO EYES, NOSE, THROAT AND LUNGS. RESPIRATORY TRACT; CENTRAL NERVOUS SYSTEM (BRAIN) EFFECTS;
HEADACHES, NAUSEA; DIZZINESS, LOSS OF BALANCE AND COORDINATION;
UNCONSCIOUSNESS, COMA; RESPIRATORY FAILURE AND DEATH. REPEATED EXCESSIVE EXPOSURES MAY CAUSE BLOOD DISORDERS SUCH AS ANEMIA & LEUKEMIA. CONTAINS A MATERIAL WHICH HAS BEEN RELATED TO CANCER IN HUMANS.

SKIN
SKIN ABSORPTION OF MATERIAL MAY PRODUCE SYSTEMIC TOXICITY. MAY CAUSE MODERATE IRRITATION WITH PROLONGED OR REPEATED CONTACT.

EYE
CONTACT WITH THE EYE MAY CAUSE MILD IRRITATION.

INGESTION
HARMFUL OR FATAL IF SWALLOWED. INGESTION OF THIS MATERIAL MAY CAUSE ABDOMINAL PAIN; PULMONARY ASPIRATION HAZARD IF SWALLOWED AND/OR VOMITING OCCURS - CAN ENTER LUNGS AND CAUSE DAMAGE. CONTAINS MATERIAL THAT HAS
BEEN RELATED TO CANCER IN HUMANS.

CARCINOGEN LISTED BY-IARC(YES) NTP(NO) OSHA(YES) ACGIH(NO) OTHER(NO)

PRE-EXISTING MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE-
DISORDERS AND DISEASES OF THE SKIN, EYE, BLOOD FORMING ORGANS,
NERVOUS SYSTEM AND OR PULMONARY SYSTEM, LUNG (E.G. ASTHMA-LIKE CONDITIONS).

4. FIRST AID MEASURES

INHALATION
MOVE PERSON TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, OBTAIN MEDICAL ASSISTANCE.

SKIN
WASH WITH SOAP AND WATER UNTIL NO ODOR REMAINS. IF REDNESS OR SWELLING DEVELOPS, OBTAIN MEDICAL ASSISTANCE. IMMEDIATELY REMOVE SOAKED CLOTHING.
WASH CLOTHING BEFORE REUSE.

EYE
FLUSH WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, OBTAIN MEDICAL

ASSISTANCE.

INGESTION
DO NOT INDUCE VOMITING] DO NOT GIVE LIQUIDS] OBTAIN EMERGENCY MEDICAL ATTENTION. SMALL AMOUNTS WHICH ACCIDENTALLY ENTER MOUTH SHOULD BE RINSED
OUT UNTIL TASTE OF IT IS GONE.

5. FIRE FIGHTING MEASURES

FLASH POINT: -40 CLOSED CUP (DEG. F); -40 CLOSED CUP (DEG. C)
AUTOIGNITION TEMP.: APPROX. 750 (DEG. F); APPROX. 400 (DEG. C)

---FLAMMABLE LIMITS IN AIR---
LOWER EXPLOSIVE LIMIT (LEL): 1.5 % VOLUME
UPPER EXPLOSIVE LIMIT (UEL): 7.6 % VOLUME

FIRE AND EXPLOSION HAZARDS
EXTREMELY FLAMMABLE LIQUID (FLASH POINT LESS THAN 20F)

EXTINGUISHING-MEDIA
WATER SPRAY. REGULAR FOAM. DRY CHEMICAL. CARBON DIOXIDE.

SPECIAL FIRE FIGHTING INSTRUCTIONS
COOL TANK/ CONTAINER. WEAR SELF-CONTAINED BREATHING APPARATUS. WEARSTRUCTURAL FIREFIGHTERS PROTECTIVE CLOTHING.

NFPA/HMIS CLASSIFICATION HAZARD RATING
HEALTH - 1 / 1 FIRE - 3 / 3

0=LEAST 1=SLIGHT 2=MODERATE
3=HIGH 4=EXTREME

REACTIVITY - 0 / 0
PERSONAL PROTECTION INDEX - X

SPECIFIC HAZARD: FLAMMABLE

6. ACCIDENTAL RELEASE MEASURES

PREVENT IGNITION; STOP LEAK; VENTILATE AREA. CONTAIN SPILL. USE WATER SPRAY TO DISPERSE VAPORS. KEEP UPWIND OF LEAK. FOR LARGE SPILL, LEAK OR RELEASE. USE PERSONAL PROTECTIVE EQUIPMENT STATED IN SECTION 8. ADVISE EPA; STATE AGENCY IF REQUIRED. ABSORB ON INERT MATERIAL. SHOVEL, SWEEP
OR VACUUM SPILL.

7. HANDLING AND STORAGE

KEEP AWAY FROM HEAT, SPARKS AND FLAME. KEEP CONTAINER TIGHTLY CLOSED. KEEP IN WELL VENTILATED SPACE. NFPA CLASS IA STORAGE. CONSULT NFPA AND OSHA CODES. TRANSFER OPERATIONS MUST BE ELECTRICALLY GROUNDED TO
DISSIPATE STATIC BUILDUP. AVOID PROLONGED BREATHING OF MIST OR VAPOR. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. AVOID CONTACT WITH EYES.
WASH THOROUGHLY AFTER HANDLING. NEVER SIPHON BY MOUTH.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

CONSULT WITH A HEALTH/SAFETY PROFESSIONAL FOR SPECIFIC SELECTION.

VENTILATION
USE ONLY WITH ADEQUATE VENTILATION. EXPLOSION PROOF VENTILATION EQUIPMENT REQUIRED.

PERSONAL PROTECTIVE EQUIPMENT

EYE
SPLASH PROOF CHEMICAL GOGGLES OR FULL FACE SHIELD RECOMMENDED TO PROTECT AGAINST SPLASH OF PRODUCT.

GLOVES
PROTECTIVE GLOVES RECOMMENDED TO PROTECT AGAINST CONTACT WITH PRODUCT. THE FOLLOWING GLOVE MATERIALS ARE ACCEPTABLE: POLYETHYLENE; NEOPRENE; NITRILE; POLYVINYL ALCOHOL; VITON;

RESPIRATOR
CONCENTRATION-IN-AIR DETERMINES PROTECTION NEEDED. USE ONLY NIOSH CERTIFIED RESPIRATORY PROTECTION. HALF-MASK AIR PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES IS ACCEPTABLE TO 10 TIMES THE EXPOSURE LIMIT. FULL-FACE AIR PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES
IS ACCEPTABLE TO 50 TIMES THE EXPOSURE LIMIT NOT TO EXCEED THE CARTRIDGE LIMIT OF 1000 PPM. PROTECTION BY AIR PURIFYING RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE-DEMAND FULL-FACE SUPPLIED AIR RESPIRATOR OR SCBA FOR EXPOSURES ABOVE 50X THE EXPOSURE LIMIT. IF EXPOSURE IS ABOVE IDLH(IMMEDIATELY DANGEROUS TO LIFE & HEALTH) OR THERE IS THE POSSIBILITY OF AN UNCONTROLLED RELEASE OR EXPOSURE LEVELS ARE UNKNOWN THEN USE A POSITIVE PRESSURE-DEMAND FULL-FACE SUPPLIED AIR RESPIRATOR WITH ESCAPE BOTTLE OR SCBA.

OTHER
IF CONTACT IS UNAVOIDABLE, WEAR CHEMICAL RESISTANT CLOTHING. THE
FOLLOWING MATERIALS ARE ACCEPTABLE AS PROTECTIVE CLOTHING MATERIALS:
POLYETHYLENE; POLYVINYL ALCOHOL(PVA); NEOPRENE; NITRILE; VITON; POLYURETHANE; SAFETY SHOWER AND EYE WASH AVAILABILITY RECOMMENDED.
LAUNDER SOILED CLOTHES. FOR NON-FIRE EMERGENCIES, POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA) & STRUCTURAL FIREFIGHTERS'
PROTECTIVE CLOTHING WILL PROVIDE LIMITED PROTECTION.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT..... : <100 - 435 (DEG. F) <38 - 223 (DEG. C)
MELTING POINT..... : N/A
SPECIFIC GRAVITY... : 0.74 (WATER=1)
PACKING DENSITY.... : N/A (KG/M3)
VAPOR PRESSURE..... : 325 TO 525 (MM HG @ 20 DEG C)
VAPOR DENSITY..... : 4 (AIR=1)
SOLUBILITY IN WATER.: SLIGHT (% BY VOLUME)
PH INFORMATION..... : N/A AT CONC. N/A G/L H2O
% VOLATILES BY VOL..: 100
EVAPORATION RATE... : RAPID & VARIES (ETHYL ETHER=1)
OCTANOL/WATER COEFF.: N.D.
APPEARANCE..... : COLORLESS LIQUID.
ODOR..... : GASOLINE ODOR
ODOR THRESHOLD..... : 15(EST) (PPM)
VISCOSITY..... : N.D. SUS @ N.D DEG F ... N.D. CST @ N.D DEG C

MOLECULAR WEIGHT... : N.D. (G/MOLE)

10. STABILITY AND REACTIVITY

STABILITY
STABLE. CONDITIONS TO AVOID-
SOURCES OF IGNITION.
INCOMPATIBLE MATERIALS
STRONG OXIDIZERS
HAZARDOUS DECOMPOSITION
CARBON MONOXIDE AND ASPHYXIANTS ARE PRODUCED BY FIRE IGNITION

POLYMERIZATION
WILL NOT OCCUR.

11. TOXICOLOGICAL INFORMATION

FOR THE PRODUCT
INHALATION: OVEREXPOSURE MAY CAUSE EYE & RESPIRATORY TRACT IRRITATION, CNS (BRAIN) EFFECTS, DIZZINESS, LOSS OF BALANCE & COORDINATION, COMA, UNCONSCIOUSNESS, DEATH. CONTAINS

BENZENE: PROLONGED/REPEATED OVER- EXPOSURE TO BENZENE CAN CAUSE BLOOD DISORDERS RANGING FROM ANEMIA TO LEUKEMIA. SKIN: PROLONGED/WIDESPREAD CONTACT MAY CAUSE ADVERSE EFFECT, IRRITATION. EYE: MILD IRRITANT.

ORAL: HARMFUL/FATAL IF SWALLOWED.
ASPIRATION HAZARD--CAN ENTER LUNGS & CAUSE DAMAGE. LIFETIME INHALATION CAUSED LIVER TUMORS (FEMALE MICE)--API STUDY ON AN UNLEADED GASOLINE.
GASOLINE ENGINE EXHAUST CLASSIFIED AS POSSIBLE (IARC 2B) CARCINOGEN (INADEQUATE EVIDENCE EXISTS IN ANIMALS & HUMANS).

XYLENE (COMPONENT) INHALATION: VAPOR HARMFUL] OVEREXPOSURE TO HIGH CONCENTRATIONS CAN CAUSE EYE, NOSE, THROAT, LUNG IRRITATION; CNS (BRAIN) EFFECTS, DIZZINESS, DIFFICULTY IN BREATHING, UNCONSCIOUSNESS, COMA AND DEATH.
REPORTS OF HEART IRREGULARITIES FROM MASSIVE EXPOSURES.
PROLONGED OVEREXPOSURES CAN CAUSE BRAIN, LIVER, KIDNEY EFFECTS/DAMAGE.

SKIN: CAN BE ABSORBED. REPEATED/PROLONGED CONTACT IS IRRITATING. EYES: IRRITANT. ORAL: HARMFUL OR FATAL IF SWALLOWED. PULMONARY ASPIRATION HAZARD-CAN ENTER LUNGS AND CAUSE DAMAGE. IN RATS, PROLONGED BREATHING OF 500 PPM-FETAL EFFECTS BUT NO BIRTH DEFECTS; NO EFFECTS AT 400 PPM.
HIGH ORAL DOSE WAS TOXIC TO PREGNANT MICE; CLEFT PALATE IN FETUSES.

TERT-BUTYL ALCOHOL (COMPONENT)
INHALATION: VAPOR HARMFUL] OVEREXPOSURE TO HIGH CONCENTRATIONS MAY CAUSE EYE, NOSE, THROAT, LUNG IRRITATION; CNS (BRAIN) EFFECTS, HEADACHE, NAUSEA, DIZZINESS, DROWSINESS, VOMITING, FATIGUE, BLURRED VISION, LOSS OF BALANCE, UNCONSCIOUSNESS.

SKIN: SLIGHT IRRITANT.

EYES: SEVERE IRRITATION WITH CONTACT.

ORAL: MODERATELY TOXIC.

SYMPTOMS SIMILAR TO INHALATION. HARMFUL OR FATAL IF SWALLOWED.
PULMONARY ASPIRATION HAZARD IF SWALLOWED AND/OR VOMITING OCCURS - CAN ENTER LUNGS AND CAUSE DAMAGE. CAUSED TOXICITY/DAMAGE TO FETUS WHEN
REPEATEDLY FED AT VERY HIGH CONCENTRATIONS TO PREGNANT MICE.

MTBE (COMPONENT) INHALATION: MAY CAUSE EYE & RESPIRATORY TRACT IRRITATION, COUGHING,
SHORTNESS OF BREATH, CNS (BRAIN) EFFECTS, HEADACHE, NAUSEA, DIZZINESS, INCOORDINATION. SKIN: PROLONGED/REPEATED CONTACT MAY CAUSE IRRITATION.

EYE CONTACT: IRRITATION. ORAL: MODERATE ACUTE TOXICITY. HARMFUL OR FATAL IF SWALLOWED AND/OR VOMITING OCCURS BECAUSE IT CAN ENTER LUNGS AND CAUSE DAMAGE--PULMONARY ASPIRATION HAZARD. LIFETIME OVEREXPOSURES
AT HIGH CONCENTRATIONS: 3000 PPM & HIGHER--RATS: DEATH, KIDNEY DAMAGE, AND KIDNEY TUMORS (MALES); AT 8000 PPM-- LIVER TUMORS IN FEMALE MICE.
MICE: MATERNAL TOXICITY & FETAL EFFECTS AT 4000 PPM. HUMAN EXPOSURES AT THESE HIGH CONCENTRATIONS ARE HIGHLY UNLIKELY.

TOLUENE (COMPONENT) INH: VAPOR HARMFUL] OVEREXPOSURE TO HIGH CONCENTRATIONS: EYE, NOSE, THROAT, LUNG IRRITATION; CNS (BRAIN) EFFECTS, DIZZINESS, DIFFICULTY IN BREATHING, COMA, DEATH. REPORTS OF HEART BEAT IRREGULARITIES FROM MASSIVE EXPOSURE. PROLONGED OVEREXPOSURE CAN CAUSE BRAIN, LIVER, KIDNEY EFFECTS/DAMAGE. SKIN: CAN BE ABSORBED. PROLONGED CONTACT IS IRRITATING.

EYE: IRRITATION.

ORAL: HARMFUL OR FATAL IF SWALLOWED. PULMONARY ASPIRATION HAZARD-CAN ENTER LUNG & CAUSE DAMAGE. PREG: MAY
CAUSE MENTAL AND/OR GROWTH RETARDATION IN CHILDREN OF FEMALE SOLVENT ABUSERS (SNIFFERS); IN RATS PROLONGED BREATHING WAS TOXIC TO FETUSES &
MOTHERS - 1500 PPM; NO BIRTH DEFECTS - 5000 PPM. NO EFFECTS - 750 PPM.

BENZENE (COMPONENT) INHALATION: VAPOR HARMFUL] OVEREXPOSURE TO HIGH CONCENTRATIONS CAN
CAUSE CENTRAL NERVOUS SYSTEM (BRAIN) EFFECTS, HEADACHE, DIZZINESS, DIFFICULTY IN BREATHING, UNCONSCIOUSNESS, COMA, DEATH. THERE ARE REPORTS OF HEART IRREGULARITIES FROM MASSIVE EXPOSURES. IARC GROUP 1- HUMAN CANCER HAZARD. REPEATED PROLONGED INHALATION CAN CAUSE BLOOD DISORDERS-ANEMIA TO LEUKEMIA. CANCER-ANIMAL STUDIES. CHANGES IN CHROMOSOMES. FETAL EFFECTS IN ANIMAL STUDIES AT REPEATED/PROLONGED EXPOSURES.

SKIN: CAN BE ABSORBED; IRRITATING.

EYE: SEVERE IRRITATION POSSIBLE.

ORAL: POISON] HARMFUL OR FATAL IF SWALLOWED. PULMONARY ASPIRATION HAZARD- CAN ENTER LUNGS AND CAUSE DAMAGE.

LIGHT PETROLEUM DISTILLATE (COMPONENT) INHALATION: OVEREXPOSURE MAY CAUSE EYE, NOSE, THROAT, RESPIRATORY TRACT
IRRITATION; CNS (BRAIN) EFFECTS, NAUSEA, DIZZINESS, UNCONSCIOUSNESS, COMA, RESPIRATORY FAILURE, DEATH. SKIN: IRRITATION WITH PROLONGED AND REPEATED CONTACT.

EYE: MILD TO MODERATE IRRITATION. ORAL: HARMFUL OR FATAL IF SWALLOWED DUE TO A PULMONARY ASPIRATION HAZARD IF SWALLOWED
AND/OR VOMITING OCCURS - CAN ENTER LUNGS AND CAUSE DAMAGE.

CUMENE (COMPONENT) INHALATION: VAPOR HARMFUL] OVEREXPOSURE TO HIGH CONCENTRATIONS CAN CAUSE EYE, NOSE, THROAT, RESPIRATORY TRACT IRRITATION, CNS (BRAIN) EFFECTS, NAUSEA, HEADACHE, DIZZINESS, DIFFICULTY IN BREATHING, INCOORDINATION, UNCONSCIOUSNESS, DEATH. SKIN: LOW ACUTE TOXICITY. CAN BE ABSORBED. MODERATE IRRITATION. EYE: MILD IRRITANT.

ORAL: MODERATE ACUTE TOXICITY. HARMFUL OR FATAL IF SWALLOWED. PULMONARY ASPIRATION HAZARD - CAN ENTER LUNGS AND CAUSE DAMAGE. OVEREXPOSURE BY INHALATION/INGESTION MAY CAUSE LIVER, KIDNEY, SPLEEN AND LUNG EFFECTS/DAMAGE. EQUIVOCAL RESULTS IN ANIMAL STUDY REPORTING BIRTH DEFECTS & EMBRYONAL MORTALITY. CONFLICTING RESULTS IN GENETIC TESTS.

ETHYL BENZENE (COMPONENT)

INHALATION: OVEREXPOSURE TO HIGH CONCENTRATIONS CAN CAUSE EYE, NOSE, THROAT & RESPIRATORY IRRITATION, CENTRAL NERVOUS SYSTEM (BRAIN) EFFECTS, DIZZINESS, LOSS OF BALANCE & COORDINATION, UNCONSCIOUSNESS, RESPIRATORY FAILURE & DEATH. PROLONGED BREATHING CAN CAUSE LIVER AND KIDNEY EFFECTS.

SKIN: LOW ACUTE TOXICITY. ABSORBABLE THROUGH SKIN. MODERATE IRRITATION.

EYE: MODERATE IRRITANT.

ORAL: HARMFUL OR FATAL IF SWALLOWED. PULMONARY ASPIRATION HAZARD IF SWALLOWED AND/OR VOMITING OCCURS-CAN ENTER LUNGS AND CAUSE DAMAGE. PROLONGED OVEREXPOSURE OF 1000 PPM CAUSED MATERNAL AND FETAL TOXICITY.

N-HEXANE (COMPONENT) INHALATION: OVEREXPOSURE TO HIGH CONCENTRATIONS CAN CAUSE EYE, NOSE, THROAT, RESPIRATORY TRACT IRRITATION; CNS (BRAIN) EFFECTS, DIZZINESS, CONFUSION, COMA.

SKIN: CAN BE ABSORBED. PROLONGED AND REPEATED CONTACT MAY CAUSE IRRITATION, BURNING SENSATION, ITCHING, BLISTERS.

EYE: IRRITATING; REPEATED EXPOSURE MAY CAUSE VISUAL DISTURBANCE.

INGESTION: ASPIRATION HAZARD IF SWALLOWED AND/OR VOMITING OCCURS - CAN ENTER LUNGS AND CAUSE DAMAGE. PROLONGED EXPOSURES CAUSE HARM TO THE CENTRAL NERVOUS SYSTEM PRODUCING A LACK OF FEELING IN EXTREMITIES (HANDS AND FEET) AND MORE SEVEE NERVE DAMAGE (PERIPHERAL NEUROPATHY).

NAPHTHALENE (COMPONENT)
INHALATION: VAPORS MAY CAUSE RESPIRATORY TRACT IRRITATION, HEADACHE, CONFUSION, EXCITEMENT, PROFUSE SWEATING, ABDOMINAL PAIN, VOMITING, DIARRHEA.

SKIN: MAY BE ABSORBED THROUGH THE SKIN. MAY CAUSE IRRITATION AND DERMATITIS. CAN CAUSE ALLERGIC SKIN REACTION.

EYE: VAPOR CAUSES IRRITATION AT 15 PPM. CONTACT MAY CAUSE IRRITATION, CONJUNCTIVITIS, CORNEAL OPACITY. REPORTED TO CAUSE CATARACTS.

ORAL: MODERATELY TOXIC IF SWALLOWED . BLOOD EFFECTS (HEMOLYSIS), LIVER &

KIDNEY INJURY MAY ALSO OCCUR. MAY CAUSE GASTROINTESTINAL IRRITATION, VOMITING, AND DIARRHEA.

CYCLOHEXANE (COMPONENT)
INHALATION: OVEREXPOSURE TO HIGH CONCENTRATIONS CAN CAUSE EYE, NOSE, THROAT, RESPIRATORY IRRITATION; CNS (BRAIN) EFFECTS, HEADACHE, DIZZINESS, EXCITEMENT, DIFFICULTY BREATHING, FATIGUE, INCOORDINATION, ANESTHESIA, UNCONSCIOUSNESS, DEATH.

SKIN: LOW ACUTE TOXICITY. MAY BE
IRRITATING WITH PROLONGED AND REPEATED CONTACT.

EYE: MAY CAUSE MILD IRRITATION WITH CONTACT.

ORAL: MODERATE ACUTE TOXICITY. INGESTION OF LARGE QUANTITIES MAY CAUSE EFFECTS SIMILIAR TO INHALATION. HARMFUL OR FATAL IF SWALLOWED AND/OR VOMITING OCCURS BECAUSE IT CAN ENTER LUNGS AND CAUSE DAMAGE--PULMONARY ASPIRATION HAZARD.

1,2,4-TRIMETHYLBENZENE (COMPONENT) INHALATION: MODERATELY TOXIC. VAPOR OR MIST IRRITATES THE EYES, MUCOUS
MEMBRANES, RESPIRATORY TRACT. OVEREXPOSURE MAY CAUSE CENTRAL
NERVOUS SYTEM (BRAIN) EFFECTS, NARCOTIC EFFECTS, NAUSEA, HEADACHE, DIZZINESS, INCOORDINATION, UNCONSCIOUSNESS, COMA, DEATH.

SKIN: CAN BE ABSORBED. CONTACT MAY CAUSE IRRITATION AND DERMATITIS. EYE: IRRITATING

INGESTION: MODERATELY TOXIC. SYMPTOMS SIMILAR TO INHALATION. HARMFUL OR FATAL IF SWALLOWED. PULMONARY ASPIRATION HAZARD- HARMFUL OR FATAL BECAUSE IT CAN ENTER THE LUNGS AND CAUSE DAMAGE.

12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY: GASOLINE SPILLS ARE TOXIC TO FISH AND AQUATIC FLORA.

13. DISPOSAL CONSIDERATIONS

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. RCRA HAZARDOUS WASTE. DO NOT FLUSH TO DRAIN/ STORM SEWER. CONTRACT TO AUTHORIZED DISPOSAL SERVICE.

14. TRANSPORTATION INFORMATION

DOT- PROPER SHIPPING NAME- GASOLINE HAZARD CLASS- 3 (FLAMMABLE LIQUID) IDENTIFICATION NUMBER- UN1203
LABEL REQUIRED- PG II, PLACARD; FLAMMABLE LIQUID
IMDG- PROPER SHIPPING NAME- GASOLINE
IATA- PROPER SHIPPING NAME- GASOLINE

15. REGULATORY INFORMATION

SARA 302 THRESHOLD PLANNING QUANTITY. N/A

SARA 304 REPORTABLE QUANTITY ..... 204 POUNDS

SARA 311 CATEGORIES- IMMEDIATE (ACUTE) HEALTH EFFECTS.. Y
DELAYED (CHRONIC) HEALTH EFFECTS.. Y
FIRE HAZARD ..... Y
SUDDEN RELEASE OF PRESSURE HAZARD. N

REACTIVITY HAZARD ..... N

WHEN A PRODUCT AND/OR COMPONENT IS LISTED BELOW, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.

FOR THE PRODUCT - FL MA MN NJ 03 04
XYLENE - FL IL MA ME MN NJ PA RI 01 07
TERT-BUTYL ALCOHOL - FL MA MN NJ PA 01
MTBE - MA NJ PA 01 07
TOLUENE - CA FL MA MN NJ PA 01 07
BENZENE - CA FL MA MN NJ PA 01 03 04 06 07 10
LIGHT PETROLEUM DISTILLATE - FL MA MN NJ
CUMENE - FL MA MN NJ PA 01 07
ETHYL BENZENE - FL MA MN NJ PA 01 07
N-HEXANE - FL MA MN NJ PA
NAPHTHALENE - FL MA MN NJ PA 01 07
CYCLOHEXANE - FL MA MN NJ PA 01 07
1,2,4-TRIMETHYLBENZENE - MA NJ PA 01

01=SARA 313
02=SARA 302/304
03=IARC CARCINOGEN
04=OSHA CARCINOGEN
05=ACGIH CARCINOGEN
06=NTP CARCINOGEN
07=CERCLA 302.4
08=WHMIS CONTROLLED PROD.
10=OTHER CARCINOGEN

THIS PRODUCT OR ALL COMPONENTS OF THIS PRODUCT ARE LISTED ON THE U.S. TSCA INVENTORY.

16. OTHER INFORMATION

PRECAUTIONARY LABELING FOR PUMPS, PORTABLE CONTAINERS, AND DRUMS IS REQUIRED. A "HAZARDOUS WHEN EMPTY" PICTOGRAM AND D.O.T. FLAMMABLE LIQUID LABEL ARE ALSO REQUIRED FOR DRUMS. BECAUSE BENZENE IS PRESENT IN THIS PRODUCT ABOVE 0.1%, THE OSHA STANDARD
FOR BENZENE IS APPLICABLE TO WORK LOCATIONS UPSTREAM OF FINAL DISCHARGE FROM TERMINALS. CONSULT 29CFR1910.1028 FOR DETAILS. PROLONGED AND REPEATED EXCESSIVE EXPOSURES TO BENZENE CAN RESULT IN BLOOD DISORDERS
RANGING FROM ANEMIA TO LEUKEMIA. RECOMMEND THAT EXPOSURES TO BENZENE BE KEPT BELOW 1.0 PPM FOR 8-HOURS; 5.0 PPM FOR 15-MIN. NORMAL SERVICE STATION OPERATIONS ARE BELOW THESE VALUES. FOR USE AS A MOTOR
FUEL ONLY. DO NOT USE FOR ANY OTHER PURPOSE.

SLURRY EXPLOSIVE CORP.

KINEPAK Liquid

Material Safety Data Sheet

5700 N. Portland, Suite 301 / Oklahoma City, OK 73112 / Phone: (405) 947-0765 / Fax: (405) 947-0768

SECTION 1 - PRODUCT INFORMATION

TRADE NAME:	KINEPAK Liquid
SYNONYM:	K1/3S, K1/2WP, K1S, K1BB, K1/2FS, K1P, K2P, K4P
CHEMICAL FAMILY:	Aliphalic hydrocarbons
FORMULA:	liquid
CAS NUMBER:	75-52-5 (Nitroethane)
UN/NA NUMBER:	UN 1261
DOT HAZARD CLASS:	3.3

SECTION 2 - HEALTH ALERT

DANGER - If misused or disposed of improperly, material could explode and cause death or serious injury.
DO NOT HANDLE WHEN IN DOUBT!!
See section VIII - Personal Protection
CHEM-TEL, INC. (800) 255-3924.

SECTION 3 - HEALTH HAZARD INFORMATION

EYE: May cause moderate irritation.
SKIN: May cause moderate irritation characterized my redness and pain.
INHALATION: Inhalation of decomposed products may irritate the respiratory tract. Prolonged exposure to these fumes may result in respiratory difficulties (shortness of breath, etc.) and possibly more severe toxic effects.
INGESTION: Swallowing large quantities may cause toxicity characterized by dizziness, bluish skin coloration, methemoglobinemia, unconsciousness, abdominal spasms, nausea, and pain.

SECTION 4 - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT: Flush with large amounts of water. Seek medical aid.
SKIN CONTACT: Remove contaminated clothing. Wash skin thoroughly with soap and water.
INHALATION: Remove from exposure. If breathing stops or is difficult, administer artificial respiration or oxygen. Seek medical aid.
INGESTION: Give 1 cup of water to dilute material. Do not induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Seek medical aid IMMEDIATELY.

SECTION 5 - RECOMMENDED OCCUPATIONAL EXPOSURE LIMIT/ HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS:	PERCENT	EXPOSURE LIMIT		MG/M3
Nitromethane (ACG/H CAS No. 75-52-5)	60-100	ACGIH TWA		250
Nitroethane (ACG/H CAS No. 79-24-3)	5-10	NONE		307

SECTION 6 - REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY: Heat (confinement); Stacking (burning), sparks.
INCOMPATIBILITY: No specific materials to avoid.
HAZARDOUS REACTION / DECOMPOSITION PRODUCTS: Thermal decomposition products are toxic and may include oxides of carbon and, possibly,irritating gases.
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION: Not applicable.

SECTION 7 - FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT & METHOD: 86° F(Nitroethane) AUTO IGNITION TEMPERATURE: 77°(Nitroethane)
FLAMMABLE LIMITS (% BY VOLUME/AIR): LOWER: 3.4% (Nitroethane) UPPER: 63.0% (Nitroethane)
EXTINGUISHING MEDIA: Type AFFF Foam
FIRE-FIGHTING PROCEDURES: Water spray should be used to cool containers. Water spray may only be used to knock down escaping vapor. Water should not be used as the burning solvent will float on the surface.
FIRE & EXPLOSION HAZARDS: Dangerous when exposed to heat or flame. The vapor is heavier than air and may travel a considerable distance to a source of ignition and flash back.

KINEPAK Liquid

MSDS Con't.

SECTION 8 - PERSONAL PROTECTION INFORMATION

EYE PROTECTION: Safety glasses approved for preventing eye contact.

SKIN PROTECTION: Neoprene, natural rubber, polyethylene or polyvinyl chloride gloves. Use barrier creams, hand protection and protective clothing.

RESPIRATORY PROTECTION: A NIOSH/MSHA- approved air-purifying respirator equipped with organic vapor cartridges up to ten times the TLV or 1000 ppm.

VENTILATION: Maintain adequate ventilation. Use local exhaust if needed.

SECTION 9 - PERSONAL HANDLING INSTRUCTIONS

HANDLING: Use only with adequate ventilation and avoid breathing vapors. Use normal good industrial hygiene and housekeeping practices.

STORAGE: Keep only in original container in a cool, well ventilated area. Do not expose sealed containers to Temperatures above 104°.

WARNING: Use of this product by persons lacking adequate training, experience and supervision may result in death or serious injury. Obey all Federal, State, and local laws / regulations applicable to transportation, storage, handling, and use of flammable liquids and explosives.

DISTANCE: Always stay away from area of explosion or disposal sites. Stay behind suitable barriers.

SECTION 10 - SPILL & LEAK PROCEDURES

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED (IN ADDITION, SEE SECTION 8): Isolate area. Eliminate ALL sources of ignition. Avoid skin contact. Collect product for re-use or disposal. For release to land, contain storm water runoff by dyking with earth or other barrier, for release to water, utilize damming, and /or water diversion to minimize the spread of contamination. Collect contaminated soil and water for disposal. Remove soiled clothing.

WASTE DISPOSAL - USE APPROPRIATE METHOD(S): Disposal of unexploded or deteriorated explosives material can be hazardous. Expert assistance is positively recommended in destroying explosives. Accidents can be prevented by thorough planning and handling in accordance with approved methods. Consult your supervisor, or the nearest SEC Regional Office for assistance. If improperly disposed of, material could explode and cause death or serious injury.

In all cases, follow facility emergency response procedures. Contact Facility Environmental Manager for assistance. Report any discharge of oil or hazardous substance that may enter surface waters to the National Response Center (800) 424 - 8802.

Observe all applicable local, state, and federal environmental spill and water quality regulations.

SECTION 11 - PHYSICAL DATA

BOILING POINT:	212° (Nitromethane) 239°(Nitroethane)
MELTING POINT:	- 130°F (Nitromethane) -40°F (Nitroethane)
VAPOR PRESSURE:	(mm Hg at 20 deg. C):27.8 (Nitromethane)
EVAPORATION RATE:	1.39 (Butyl Acetate=1)
VAPOR DENSITY (AIR=1):	2.11(Nitromethane)
VISCOSITY:	NA
SOLUBILITY IN WATER:	Completely Soluble
APPEARANCE/ ODOR:	Colorless Liquid

SECTION 12 - COMMENTS

Storage should be in a well constructed, well ventilated, dry structure located to conform with local, state, and federal regulations.

Normal operating conditions are assumed unless otherwise stated. If any given information is not clear or does not apply to your situation, STOP, store the material suitably, and seek correct help from your supervisors, Institute of Makers of Explosives or Slurry Explosive Corporation. Disposal sites must be clear of people at the time of disposal.

NOTICE: The data and recommendations presented herein are based upon data which are considered to be accurate. However, Slurry makes no guarantee or warranty, either expressed or implied, of the accuracy or completeness of these data and recommendations.

Date of Revision: May, 2001

MSDS
OIL, 2 CYCLE

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 800742
PRODUCT NAME(S): AMOCO 2 CYCLE ENG OIL
PRODUCT IDENTIFICATION: PRODUCT CODE R00000373007
DATE OF MSDS : 1993-06-02
*** MATERIAL SAFETY DATA ***
PRIMARY APPLICATION- ENGINE OIL
SYNONYMS..... : TWO-CYCLE ENGINE OIL
CAS REGISTRY NO: SEE SEC. 2
CAS NAME..... : NO CLASSIFICATION - MIXTURE
CHEMICAL FAMILY: BLEND
EMERGENCY PHONE NUMBERS (AFTER NORMAL BUSINESS HOURS)
SUN CO.. 1-800-964-8861
CHEMTREC. 1-800-424-9300
2. COMPOSITION / INFORMATION ON INGREDIENTS
EXPOSURE GUIDELINES

			OSHA		ACGIH		SUN/MFR
COMPONENT/CAS NO.	LO%	HI%	TWA	STEL	TWA	STEL	UNIT
LIMITS FOR THE PRODUCT:			5		5		MG/M3
SEVERELY SOLVENT REFINED HEAVY PARAFFINIC PETROLEUM OIL							
64741-88-4	65.00	90.00	5		5		MG/M3
PROPRIETARY	10.00	30.00					NO SPECIFIC LIMIT

ADDITIONAL EXPOSURE LIMITS
---------- GOVERNMENT REGULATION
OTHER LIMIT- OIL MIST: 5 MG/M3 (OSHA PEL/ACGIH TLV)
3. HAZARDS IDENTIFICATION
EMERGENCY OVERVIEW ----------
FLASH POINT: 345 TYPICAL COC (DEG. F); 174 TYPICAL COC (DEG. C)
NOT EXPECTED TO CAUSE A SEVERE EMERGENCY HAZARD.
APPEARANCE-- GREEN COLORED OIL
ODOR-- SLIGHT ODOR
POTENTIAL HEALTH EFFECTS ----------
PRIMARY ROUTES OF ENTRY-
INHALATION( ) SKIN(X) EYE( ) INGESTION( )
INHALATION ----------
NO EFFECTS EXPECTED.
SKIN ----------
PRACTICALLY NON-TOXIC IF ABSORBED (LD50 GREATER THAN 2000 MG/KG). MAY CAUSE MILD IRRITATION WITH PROLONGED OR REPEATED CONTACT.
EYE ----------
CONTACT WITH THE EYE MAY CAUSE MINIMAL IRRITATION.
INGESTION ----------
PRACTICALLY NON-TOXIC (LD50 > 15G/KG).
CARCINOGEN LISTED BY-IARC(NO) NTP(NO) OSHA(NO) ACGIH(NO) OTHER(NO)
PRE-EXISTING MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE-
SKIN DISORDERS
4. FIRST AID MEASURES
INHALATION ----------
MOVE PERSON TO FRESH AIR.
SKIN ----------
WASH WITH SOAP AND WATER UNTIL NO ODOR REMAINS. WASH CLOTHING BEFORE REUSE.
EYE ----------
FLUSH WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, OBTAIN MEDICAL ASSISTANCE.
INGESTION ----------
PRACTICALLY NON-TOXIC -- INDUCTION OF VOMITING NOT REQUIRED. OBTAIN EMERGENCY MEDICAL ATTENTION. SMALL AMOUNTS WHICH ACCIDENTALLY ENTER MOUTH SHOULD BE RINSED OUT UNTIL TASTE OF IT IS GONE.
5. FIRE FIGHTING MEASURES
AUTOIGNITION TEMP.: NOT DETERMINED (DEG. F); NOT

DETERMINED (DEG. C)
---FLAMMABLE LIMITS IN AIR---
LOWER EXPLOSIVE LIMIT (LEL): NOT DETERMINED % VOLUME
UPPER EXPLOSIVE LIMIT (UEL): NOT DETERMINED % VOLUME
FIRE AND EXPLOSION HAZARDS

CAN BE MADE TO BURN (FLASH POINT GREATER THAN 200F).
EXTINGUISHING-MEDIA ----------
WATER SPRAY. REGULAR FOAM. DRY CHEMICAL. CARBON DIOXIDE.
SPECIAL FIRE FIGHTING INSTRUCTIONS

WEAR SELF-CONTAINED BREATHING APPARATUS. WEAR STRUCTURAL FIREFIGHTERS
PROTECTIVE CLOTHING.
NFPA/HMIS CLASSIFICATION HAZARD RATING
HEALTH - 0 / 0 0=LEAST 1=SLIGHT
FIRE - 1 / 1 2=MODERATE 3=HIGH
REACTIVITY - 0 / 0
4=EXTREME
PERSONAL PROTECTION INDEX - X
SPECIFIC HAZARD: NONE LISTED
6. ACCIDENTAL RELEASE MEASURES
CONTAIN SPILL. ADVISE EPA; STATE AGENCY IF REQUIRED. ABSORB ON INERT MATERIAL. SHOVEL, SWEEP OR VACUUM SPILL.
7. HANDLING AND STORAGE
NFPA CLASS IIIB STORAGE. WASH THOROUGHLY AFTER HANDLING.
8. EXPOSURE CONTROL / PERSONAL PROTECTION
CONSULT WITH A HEALTH/SAFETY PROFESSIONAL FOR SPECIFIC SELECTION.
VENTILATION ----------
VENTILATE AS NEEDED TO COMPLY WITH EXPOSURE LIMIT. GENERAL DILUTION
VENTILATION ACCEPTABLE.
PERSONAL PROTECTIVE EQUIPMENT
SUPPLIED AIR RESPIRATOR WITH ESCAPE BOTTLE OR SCBA.
OTHER ----------

EYE ----------
SPLASH PROOF CHEMICAL GOGGLES RECOMMENDED TO PROTECT AGAINST SPLASH OF PRODUCT.
GLOVES ----------
PROTECTIVE GLOVES RECOMMENDED WHEN PROLONGED SKIN CONTACT CANNOT BE
AVOIDED. THE FOLLOWING GLOVE MATERIALS ARE ACCEPTABLE: POLYVINYL CHLORIDE (PVC); NEOPRENE; NITRILE; POLYVINYL ALCOHOL; VITON;
RESPIRATOR ----------
CONCENTRATION-IN-AIR DETERMINES PROTECTION NEEDED. USE ONLY NIOSH CERTIFIED RESPIRATORY PROTECTION. RESPIRATORY PROTECTION USUALLY NOT
NEEDED UNLESS PRODUCT IS HEATED OR MISTED. HALF-MASK AIR PURIFYING RESPIRATOR WITH DUST/MIST FILTERS OR HEPA FILTER CARTRIDGES IS
ACCEPTABLE TO 10 TIMES THE EXPOSURE LIMIT. FULL-FACE AIR PURIFYING RESPIRATOR WITH
DUST/MIST FILTERS OR HEPA FILTER CARTRIDGES IS
ACCEPTABLE TO 50 TIMES THE EXPOSURE LIMIT. PROTECTION BY AIR PURIFYING
RESPIRATORS IS LIMITED. USE A POSITIVE PRESSURE-DEMAND FULL-FACE
SUPPLIED AIR RESPIRATOR OR SCBA FOR EXPOSURES ABOVE 50X THE EXPOSURE LIMIT. IF EXPOSURE IS ABOVE IDLH(IMMEDIATELY DANGEROUS TO LIFE & HEALTH) OR THERE IS THE POSSIBILITY OF AN UNCONTROLLED RELEASE OR EXPOSURE
LEVELS ARE UNKNOWN THEN USE A POSITIVE PRESSURE-DEMAND FULL-FACE

IF CONTACT IS UNAVOIDABLE, WEAR CHEMICAL RESISTANT CLOTHING. THE FOLLOWING MATERIALS ARE

ACCEPTABLE AS PROTECTIVE CLOTHING MATERIALS:
POLYVINYL ALCOHOL(PVA); POLYVINYL CHLORIDE(PVC); NEOPRENE; NITRILE; VITON; POLYURETHANE; LAUNDER SOILED CLOTHES.

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT..... : HIGH WITH (DEG. F) _____ WIDE RANGE (DEG. C)
MELTING POINT..... : N/A (DEG. F) _____ N/A (DEG. C)
SPECIFIC GRAVITY... : 0.87 (WATER=1)
PACKING DENSITY.... : N/A (KG/M3)
VAPOR PRESSURE..... : < 0.0001 (MM HG @ 20 DEG C)
VAPOR DENSITY..... : 10+ (AIR=1)
SOLUBILITY IN WATER.: NIL (% BY VOLUME)
PH INFORMATION..... : 8.5 AT CONC. N.D. G/L H2O
% VOLATILES BY VOL..: NIL
EVAPORATION RATE... : 1000X SLOWER (ETHYLETHER=1)
OCTANOL/WATER COEFF.: N.D.
APPEARANCE..... : GREEN COLORED OIL
ODOR..... : SLIGHT ODOR
ODOR THRESHOLD..... : N.D. (PPM)
VISCOSITY..... : 194 SUS @ 100 DEG F ... 37.7 CST @ 40 DEG C
MOLECULAR WEIGHT... : N.D. (G/MOLE)

10. STABILITY AND REACTIVITY

STABILITY
----------STABLE.
INCOMPATIBLE MATERIALS ---- STRONG OXIDIZERS
HAZARDOUS DECOMPOSITION

COMBUSTION WILL PRODUCE CARBON MONOXIDE AND ASPHYXIANTS
POLYMERIZATION ------WILL NOT OCCUR.

11. TOXICOLOGICAL INFORMATION

FOR THE PRODUCT ----------
INHALATION: LOW ACUTE TOXICITY.
IATA- PROPER SHIPPING NAME- NO DATA AVAILABLE

15. REGULATORY INFORMATION

SARA 302 THRESHOLD PLANNING QUANTITY. N/A
SARA 304 REPORTABLE QUANTITY ..... N/A
SARA 311 CATEGORIES- IMMEDIATE
SKIN: EXPECTED TO BE ACUTELY NON-TOXIC
IF ABSORBED. MILD IRRITATION WITH PROLONGED OR REPEATED CONTACT.
EYE:
MINIMALLY IRRITATING ON CONTACT.
ORAL: PRACTICALLY NON-TOXIC.
SEVERELY SOLVENT REFINED HEAVY PARAFFINIC PETROLEUM OIL (COMPONENT)
INHALATION: LOW ACUTE TOXICITY.
SKIN: PRACTICALLY NON-TOXIC BY ABSORPTION. MAY CAUSE MODERATE IRRITATION WITH PROLONGED AND REPEATED CONTACT.
EYE: MINIMALLY IRRITATING ON CONTACT. INGESTION: PRACTICALLY NON-TOXIC IF SWALLOWED.
PROPRIETARY (COMPONENT)
COMPONENT IDENTITY NOT SPECIFIED: NO TOXICOLOGY STATEMENT AVAILABLE.

12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY ----------
NO DATA AVAILABLE

13. DISPOSAL CONSIDERATIONS

FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS. NOT A RCRA HAZARDOUS WASTE
IF UNCONTAMINATED. IF "USED", RCRA CRITERIA (IGNITABILITY, REACTIVITY, CORROSIVITY, TOXICITY CHARACTERISTICS) MUST BE DETERMINED. DO NOT FLUSH TO DRAIN/ STORM SEWER. CONTRACT TO AUTHORIZED DISPOSAL SERVICE.

14. TRANSPORTATION INFORMATION

DOT- PROPER SHIPPING NAME- PETROLEUM LUBRICATING OIL
HAZARD CLASS- NOT REGULATED
IDENTIFICATION NUMBER- NOT REGULATED
LABEL REQUIRED- NOT REGULATED
IMDG- PROPER SHIPPING NAME- NO DATA AVAILABLE

(ACUTE) HEALTH EFFECTS.. N
DELAYED (CHRONIC) HEALTH EFFECTS.. N
FIRE HAZARD ..... N
SUDDEN RELEASE OF PRESSURE HAZARD. N
REACTIVITY HAZARD ..... N
WHEN A COMPONENT OF THIS PRODUCT IS LISTED BELOW, THE REGULATORY LIST ON WHICH IT APPEARS IS INDICATED.
THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICALS.
01=SARA 313 02=SARA 302/304
03=IARC CARCINOGEN
04=OSHA CARCINOGEN 05=ACGIH CARCINOGEN 06=NTP CARCINOGEN
07=CERCLA 302.4 08=WHMIS CONTROLLED PROD.
10=OTHER CARCINOGEN
PA=PENNSYLVANIA RTK NJ=NEW JERSEY RTK CA=CALIFORNIA PROP 65
MA=MASSACHUSETTS RTK
MI=MICHIGAN 406 MN=MINNESOTA RTK FL=FLORIDA RI=RHODE ISLAND IL=ILLINOIS
NY=NEW YORK WV=WEST VIRGINIA CT=CONNECTICUT
LA=LOUISIANA ME=MAINE
OH=OHIO
16. OTHER INFORMATION
CAUTION] PROLONGED OR REPEATED CONTACT WITH USED MOTOR OIL MAY BE HARMFUL TO SKIN AND COULD CAUSE SKIN CANCER. PROMPTLY WASH AFFECTED AREA WITH SOAP AND WATER. WHMIS CLASSIFICATION: NOT CONTROLLED

DETOTEC NORTH AMERICA, INC.

MATERIAL SAFETY DATA SHEET

RDX/NYLON DETONATING CORD

SECTION I — **Issued by the Safety and Compliance Dept.**

DETOTEC NORTH AMERICA, INC.
366 ROSS HILL ROAD
CHARLESTOWN, RI 02813
EMERGENCY PHONE
DAY 1-800-255-3924
NIGHT 1-800-255-3924

TRADE NAME AND SYNONYMS
80 RDX Detonating Cord
Detotec 80 RDX
Pipebuster Special RDX

SECTION II HAZARDOUS INGREDIENTS

RDX, Hexogen, Cyclonite, Cyclotrimethylene Trinitramine, $C_3 H_6 N_6 O_6$, CAS No. 121-82-4

SECTION III PHYSICAL DATA

BOILING POINT	N/A	VAPOR PRESSURE (mm Hg)	Negligible
SPECIFIC GRAVITY (H_2O =1)	N/A	VAPOR DENSITY (Air = 1)	N/A
PERCENT VOLATILE BY VOL. (%)	None	EVAPORATION RATE:	N/A
SOLUBILITY IN WATER:	Negligible		

APPEARANCE AND ODOR: Flexible cord with an explosive core of RDX protected within a textile braid covered by a seamless nylon jacket. RDX is a white crystalline solid. No odor.

SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT:	N/A
FLAMMABLE LIMITS:	N/A
EXTINGUISHING MEDIA:	See below
SPECIAL FIREFIGHTING PROCEDURES:	Do not fight fire. Withdraw personnel immediately. Allow fire to burn itself out.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	May explode when subjected to fire or shock. Avoid toxic fumes from fire.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: ACGIH: RDX - Skin TWA 1.5 MG/M^3
OSHA: RDX - Skin TWA 1.5 MG/M^3

EFFECTS OF OVEREXPOSURE: Ingestion of RDX may cause disorders or epiliptiform seizures.

EMERGENCY AND FIRST AID PROCEDURES:
FUMES: Remove to fresh air.
IF INGESTED: Obtain medical attention immediately.

DETOTEC NORTH AMERICA, INC.

MATERIAL SAFETY DATA SHEET

RDX/NYLON DETONATING CORD

SECTION VI REACTIVITY DATA Issued by the Safety and Compliance Dept.

STABILITY: Stable under normal conditions. May explode when subjected to fire or shock.

INCOMPATIBILITY (MATERIALS TO AVOID): Avoid contact with strong acids or alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS: Gaseous Nitrogen Oxides and Carbon Oxides

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Sweep up and dispose of all spilled material immediately. Do not permit smoking or open flames near spill site.

WASTE DISPOSAL METHOD: Dispose of under direct supervision of a qualified person according to local, state and federal regulations. Call Detotec North America, Inc. for recommendations and assistance. This material may become a hazardous waste under certain conditions and must be collected, labeled and disposed of per state and federal hazardous waste regulations.

TRANSPORTATION EMERGENCIES INVOLVING SPILLS, LEAKS, FIRES OR EXPOSURES
CALL CHEMTEL: 1-800-255-3924

SECTION VIII SPECIAL PROTECTION INFORMATION:

RESPIRATORY PROTECTION:	Not required under normal conditions.
VENTILATION:	Not required under normal conditions.
PROTECTIVE GLOVES:	Not required except to prevent abrasive injuries.
EYE PROTECTION:	Not required under normal conditions.

SECTION IX SPECIAL PRECAUTIONS

COMPLY WITH "ALWAYS AND NEVER" AS ADOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES. TRANSPORTATION, STORAGE AND USE MUST COMPLY WITH OSHA SAFETY AND HEALTH STANDARDS 29CFR1910.109, APPLICABLE MSHA REGULATIONS, THE DOT AND HAZARDOUS MATERIALS REGULATIONS BATF REQUIREMENTS AND STATE AND LOCAL TRANSPORTATION, STORAGE AND USE REGULATIONS AND ORDINANCES.

DOT CLASSIFICATION: Explosive 1.1D*

UN NUMBER: UN0065 IMO HAZARD CLASS: 1.1D

*May be offered for transportation domestically and transported as Cord, Detonating (UN 0289), Division 1.4 compatibility group D (1.4D) Explosives, provided the explosive content does not exceed 100 grains per linear foot and the gross weight of all packages of detonating cord does not exceed (45 KG) 99 pounds per vehicle. See 49 CFR 173.63

The maximum recommended temperature for RDX/Nylon detonating cord is 325° F (163° C).
None of the components are listed in the 1987 IARC Monographs, Group 1, 2A or 2B as known, probable, or possible carcinogens, nor are they listed in the NTP annual report on carcinogens.

Slurran 805/806

MATERIAL SAFETY DATA SHEET

5700 N. Portland, Suite 301 / Oklahoma City, OK 73112 / Phone: (405) 947-0765 / Fax: (405) 947-0768

SECTION 1 - PRODUCT INFORMATION

TRADE NAME:	Slurran 805, Slurran 806
SYNONYM:	NA
CHEMICAL FAMILY:	Watergel Slurry Explosive
FORMULA:	Mixture
CAS NUMBER:	None
UN/NA NUMBER:	UN0332
DOT HAZARD CLASS:	Explosive, Blasting, Type E, Class 1.5 D

SECTION 2 - HEALTH ALERT

DANGER - If misused or disposed of improperly, material could explode and cause death or serious injury.
DO NOT HANDLE WHEN IN DOUBT!!
See section VIII - Personal Protection
CHEM-TEL, INC. (800) 255-3924.

SECTION 3 - HEALTH HAZARD INFORMATION

EYE:	May cause moderate irritation.
SKIN:	May cause moderate irritation characterized my redness and/or rash.
INHALATION:	Inhalation of decomposed products may irritate the respiratory tract. Prolonged exposure to these fumes may result in respiratory difficulties (shortness of breath, etc.) and possibly more severe toxic effects.
INGESTION:	Swallowing large quantities may cause toxicity characterized by dizziness, bluish skin coloration, methemoglobinemia, unconsciousness, abdominal spasms, nausea, and pain.

SECTION 4 - EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:	Flush with large amounts of water. Seek medical aid.
SKIN CONTACT:	Remove contaminated clothing. Wash skin thoroughly with soap and water.
INHALATION:	Remove from exposure. If breathing stops or is difficult, administer artificial respiration or oxygen. Seek medical aid.
INGESTION:	Give 8-16 oz. of milk or water. Induce vomiting. Seek medical aid.

SECTION 5 - RECOMMENDED OCCUPATIONAL EXPOSURE LIMIT/ HAZARDOUS INGREDIENTS

EXPOSURE LIMIT (PRODUCT): None required for product.

HAZARDOUS INGREDIENTS:	PERCENT	EXPOSURE LIMIT	PPM	MG/M3
Ammonium Nitrate	<75	NONE		
Sodium Nitrate	<5	NONE		
Sodium Perchlorate	<5	NONE		
Nitric Acid*	<8	ACGIH - TLV	2	5
Hexamine*	<15	NONE		
Aluminum	<3	ACGIH - TLV	10	

*React to form Hexaminedinitrate
NOTE: All ingredients are present in a gelled slurry matrix and individual hazard may not be present in this formulation.

SECTION 6 - REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY: Heat (confinement); Stacking (burning).
INCOMPATIBILITY: Can react violently or explode, with reducing agents and organic materials. Avoid amines, strong alkalies & acids.
HAZARDOUS REACTION / DECOMPOSITION PRODUCTS: At high temperatures, especially >374 F, may emit severe toxic fumes of nitrogen oxides.
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION: Not applicable.

SECTION 7 - FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT & METHOD: NA AUTO IGNITION TEMPERATURE: Explodes
FLAMMABLE LIMITS (% BY VOLUME/AIR): LOWER: NA UPPER: NA
EXTINGUISHING MEDIA: Water
FIRE-FIGHTING PROCEDURES: When explosive is burning, EVACUATE AREA. Avoid breathing vapor
FIRE & EXPLOSION HAZARDS: Dangerous when exposed to heat or flame. Can support combustion of other materials involved in a fire and is capable of undergoing detonation if heated to high temperatures especially under confinement including being piled on itself in a burning fire. When heated to decomposition, highly toxic fumes may be emitted. Do not return to area of explosion until smoke and fumes have dissipated. Dry alkali or amine salts are explosive.

Slurran 805/806 MSDS, Con't.

SECTION 8 - PERSONAL PROTECTION INFORMATION

EYE PROTECTION: Safety goggles approved for the handling of explosives materials.

SKIN PROTECTION: Neoprene, natural rubber, polyethylene or polyvinyl chloride gloves. Use barrier creams, hand protection and protective clothing.

RESPIRATORY PROTECTION: Not normally required. Mechanical filter or supplied air type respirator as required for concentrations exceeding the occupational exposure limit.

VENTILATION: Maintain adequate ventilation. Use local exhaust if needed.

SECTION 9 - PERSONAL HANDLING INSTRUCTIONS

HANDLING: Explosives should not be abandoned at any location for any reason. Do not handle during electrical storms.

STORAGE: Store in a cool, dry, well-ventilated area remote from operations. Storage area should be of non-combustible construction. Organic materials, flammable substances and finely divided metals should be stored separately. Flames, smoking and unauthorized personnel are prohibited where this product is used or stored. Protect against physical damage, static electricity and lightning.

WARNING: Use of this product by persons lacking adequate training, experience and supervision may result in death or serious injury. Obey all Federal, State, and local laws / regulations applicable to transportation, storage, handling, and use of explosives.

DISTANCE: Always stay from area of explosion or disposal sites. Stay behind suitable barriers.

SECTION 10 - SPILL & LEAK PROCEDURES

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED (IN ADDITION, SEE SECTION 8): Isolate area. Eliminate ALL sources of ignition. Avoid skin contact. Scrape up. Remove soiled clothing.

WASTE DISPOSAL - USE APPROPRIATE METHOD(S): Disposal of unexploded or deteriorated explosives material can be hazardous. Expert assistance is positively recommended in destroying explosives. Accidents can be prevented by thorough planning and handling in accordance with approved methods. Consult your supervisor, or the nearest SEC Regional Office for assistance. If improperly disposed of, material could explode and cause death or serious injury.

In all cases, follow facility emergency response procedures. Contact Facility Environmental Manager for assistance. Report any discharge of oil or hazardous substance that may enter surface waters to the National Response Center (800) 424 - 8802.

Observe all applicable local, state, and federal environmental spill and water quality regulations.

SECTION 11 - PHYSICAL DATA

BOILING POINT:	NA	BULK DENSITY:	1.25 g/cc
MELTING POINT:	NA	%VOLATILE BY VOLUME:	NA
VAPOR PRESSURE:	NA	EVAPORATION RATE (ETHER=1):	NA
SOLUBILITY IN WATER:	Negligible with short term exposure	APPEARANCE/ ODOR:	Odorless,gray/white gel
DECOMPOSITION POINT:	200 C		

SECTION 12 - COMMENTS

This product is classified as a Blasting Agent and need not be stored in a high explosive magazine, except where required by local regulations, as long as it is completely separate from any high explosives. Storage should be in a well constructed, well ventilated, dry structure located to conform with local, state, and federal regulations. The area surrounding an explosive magazine must be kept clear of combustible materials for a distance of 50 feet. Magazine floors and containers must be properly cleaned. Normal operating conditions are assumed unless otherwise stated. If any given information is not clear or does not apply to your situation, STOP, store the material suitably, and seek correct help from your supervisors, Institute of Makers of Explosives or Slurry Explosive Corporation.

Disposal sites must be clear of people at the time of disposal.

NOTICE: The data and recommendations presented herein are based upon data which are considered to be accurate. However, SEC makes no guarantee or warranty, either expressed or implied, of the accuracy or completeness of these data and recommendations. For more detailed information on the hazards of this product, contact the Regulatory Compliance Department at the address below:

Slurry Explosive Corporation
P. O. Box 348
Columbus, Kansas 66725
(316) 597-2552

Date of Revision: September 8, 1999

WD-40 COMPANY -- WD-40 -- 8030-00-838-7789

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

Product ID:WD-40
MSDS Date:03/01/1990
FSC:8030
NIIN:00-838-7789
MSDS Number: CGLST
=== Responsible Party ===
Company Name:WD-40 COMPANY
Address:1061 CUDAHY PLACE (92110)
Box:80607
City:SAN DIEGO
State:CA
ZIP:92138-9021
Country:US
Info Phone Num:619-275-1400
Emergency Phone Num:619-275-1400,CHEMTREC 800-424-9300
Preparer's Name:R. MILES, TECH DIRECTOR
CAGE:09137
=== Contractor Identification ===
Company Name:NORTHERN AUTOMOTIVE AUTOWORKS DIV
Box:UNKNOW
CAGE:0PLX0
Company Name:WD-40 COMPANY
Address:1061 CUDAHY PLACE (92110)
Box:80607
City:SAN DIEGO
State:CA
ZIP:92138-0607
Country:US
Phone:619-275-1400
CAGE:09137

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

Ingred Name:STODDARD SOLVENT
CAS:8052-41-3
RTECS #:WJ8925000
Fraction by Wt: 50%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:500 PPM
ACGIH TLV:100 PPM; 9596

Ingred Name:A-70 HYDROCARBON PROPELLANT OR LPG (LIQUEFIED PETROLEUM GAS)
CAS:68476-85-7
RTECS #:SE7545000
Fraction by Wt: 25%
Other REC Limits:NONE RECOMMENDED
OSHA PEL:1000 PPM
ACGIH TLV:1000 PPM; 9596

Ingred Name:PETROLEUM BASE OIL
CAS:64742-65-0
Fraction by Wt: >15%

Other REC Limits:NONE RECOMMENDED
OSHA PEL:5 MG/M3 (OIL MIST)
ACGIH TLV:5 MG/M3 (OIL MIST)

Ingred Name:NON HAZARDOUS INGREDIENTS
Fraction by Wt: <10%
Other REC Limits:NONE RECOMMENDED

========== Hazards Identification ==========

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES
Reports of Carcinogenicity:NTP:NO IARC:NO OSHA:NO
Health Hazards Acute and Chronic:INHALATION MAY CAUSE UPPER RESPIRATORY IRRITATION & CNS EFFECTS. SKIN OR EYE CONTACT MAY CAUSE IRRITATION. INGESTION MAY CAUSE GI TRACT IRRITATION. ASPIRATION INTO LUNGS MAY CAUSE CHEMICAL PNEUMONITIT S. CHRONIC: NONE SPECIFIED BY MANUFACTURER.
Explanation of Carcinogenicity:NO INGREDIENT OF A CONCENTRATION OF 0.1% OR GREATER IS LISTED AS A CARCINOGEN BY IARC, NTP OR OSHA.
Effects of Overexposure:INHALED-UPPER RESPIRATORY IRRITATION, HEADACHE, DIZZINESS, NAUSEA. SKIN-DRYING SKIN, IRRITATION. EYES-IRRITATION, TEARING, REDNESS. INGESTION-IRRITATION, NAUSEA, VOMITING, DIARRHEA.
Medical Cond Aggravated by Exposure:NONE SPECIFIED BY MANUFACTURER.

========== First Aid Measures ==========

First Aid:GET MEDICAL HELP IF SYMPTOMS PERSIST. INHALATION-REMOVE TO FRESH AIR. PROVIDE ARTIFICIAL RESPIRATION OR OXYGEN IF NEEDED. EYES-FLUSH WITH WATER FOR 15 MINUTES, HOLDING EYELIDS OPEN. SKIN-WASH WITH SOA P & WATER. INGESTION-DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

========== Fire Fighting Measures ==========

Lower Limits:1.8
Upper Limits:9.5
Extinguishing Media:CARBON DIOXIDE, FOAM, DRY CHEMICAL.
Fire Fighting Procedures:NONE.
Unusual Fire/Explosion Hazard:CONSIDERED "EXTREMELY FLAMMABLE" UNDER CONSUMER PRODUCT SFAETY COMMISSION REGULATIONS.

========== Accidental Release Measures ==========

Spill Release Procedures:SPILL UNLIKELY FROM AEROSOL CANS. LEAKING CANS SHOULD BE PLACED IN PLASTIC BAG OR OPEN PAIL UNTIL PRESSURE HAS DISSAPATED.
Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

========== Handling and Storage ==========

Handling and Storage Precautions:STORE SPRAY CANS IN COOL, WELL VENTILATED AREAS AWAY FROM SOURCES OF IGNITION SUCH AS SPARKS, FLAMES, WELDING ARCS, SUNLIGHT. DO NOT STORE ABOVE 120F.
Other Precautions:"EMPTY" CONTAINERS RETAIN RESIDUE AND MAY BE DANGEROUS. FOLLOW ALL MANUFACTURER'S LABEL INSTRUCTIONS. AVOID REPEATED/PROLONGED SKIN CONTACT. KEEP OUT OF REACH OF CHILDREN. DO

NOT BREATHE VAPORS.

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

Respiratory Protection:IF TLV IS EXCEEDED, WEAR NIOSH-APPROVED ORGANIC VAPOR RESPIRATOR OR AIR-PURIFYING RESPIRATOR. IN EMERGENCY, WEAR A NIOSH- APPROVED POSITIVE-PRESSURE SELF-CONTAINED BREATHING APPARATUS.
Ventilation:MECHANICAL (GENERAL AND/OR LOCAL EXHAUST, EXPLOSION-PROOF) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).
Protective Gloves:PLASTIC, RUBBER, NEOPRENE
Eye Protection:CHEMICAL SAFETY GOGGLES
Other Protective Equipment:EYE WASH STATION & SAFETY SHOWERS SHOULD BE AVAILABLE IN THE IMMEDIATE VICINITY OF ANY POTENTIAL EXPOSURE.
Work Hygienic Practices:OBSERVE GOOD INDUSTRIAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. WASH THOROUGHLY BEFORE EATING, DRINKING/SMOKING.
Supplemental Safety and Health
FLAMMABLE AEROSOL UPC LEVEL 3.

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

HCC:V3
Vapor Pres:55 PSI
Vapor Density:>1
Spec Gravity:0.710
Solubility in Water:INSOLUBLE
Appearance and Odor:LIGHT AMBER WITH CHARACTERISTIC ODOR.
Percent Volatiles by Volume:80

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

Stability Indicator/Materials to Avoid:YES
STRONG OXIDIZING AGENTS.
Stability Condition to Avoid:NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:THERMAL DECOMPOSITION MAY YIELD CARBON MONOXIDE AND/OR CARBON DIOXIDE.
Conditions to Avoid Polymerization:WILL NOT OCCUR.

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

Waste Disposal Methods:DISPOSE OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. DO NOT PUNCTURE, INCINERATE SPRAY CANS. DISPOSE OF EMPTY CANS IN TRASH PICK-UP. DO NOT PLACE IN HOME TRASH COMPACTOR.