Appendix B:

Site Safety and Health Plan/Accident Prevention Plan (SSHP/APP)

This Page Intentionally Left Blank

FINAL
ACCIDENT PREVENTION PLAN AND SITE SAFETY AND HEALTH PLAN FOR REMEDIAL INVESTIGATION SERVICES

AT THE FORMER
NIAGARA FALLS-BUFFALO DEFENSE NIKE BATTERY BU-34/35
EAST AURORA AND ORCHARD PARK, NEW YORK

THE FORMERLY USED DEFENSE SITE (FUDS), NO. C02NY007701

CONTRACT NO. W912DR-13-D-0013

Prepared for:

U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Prepared by:

TI2E JV, LLC
3761 Attucks Drive,
Powell, OH 43065

February 2016

This Page Intentionally Left Blank

TABLE OF CONTENTS

FIGURES

TABLES

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
°F	Degrees Fahrenheit
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
CAS	Chemical Abstracts Service
CFR	Code of Federal Regulations
COC	Chemical of Concern
CP	Competent Person
CPR	Cardiopulmonary Resuscitation
CRZ	Contaminant Reduction Zone
CSP	Certified Safety Professional
dBA	Decibels Utilizing the A Filter
EAC	Emergency Action Coordinator
EAP	Emergency Action Plan
ERS	Environmental Remediation Services
EZ	Exclusion Zone
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSPM	Health and Safety Program Manager
IDW	Investigation Derived Waste
IEI	Inspection Experts Inc.
kV	Kilovolt
MSDSs	Material Safety Data Sheets
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PID	Photo-Ionization Detector
PM	Project Manager
POC	Point of Contact
PPE	Personal Protective Equipment
ppm	Parts per Million
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SOW	Scope of Work
SVOCs	Semi-volatile Organic Compound
SZ	Support Zone
TI2E	A joint venture between Tidewater, Inc. and Inspection Experts Inc.
Tidewater	Tidewater, Inc.
TTZ	Target Treatment Zone
TWA	Time weighted average
USEPA	United States Environmental Protection Agency
USACE	United States Army Corps of Engineers
VOC	Volatile Organic Compound
WBGT	Wet Bulb Globe Temperature
WP	Work Plan

FINAL

ACCIDENT PREVENTION PLAN AND SITE SAFETY AND HEALTH PLAN FOR ENVIRONMENTAL REMEDIATION SERVICES

At The Former Niagara Falls-Buffalo Defense Nike Battery BU-34/35 East Aurora and Orchard Park, New York

The Formerly Used Defense Site (FUDS), No. C02NY007701

Contract No. W912DR-13-D-0013

Prepared by:
TI2E JV, LLC
3761 Attucks Drive,
Powell, OH 43065

Prepared by:

_____ February 19, 2016

Ben Headington, PMP
Task Manager
Tidewater, Inc.
Office (614) 792-2897; Cell (614) 348-8939

Date

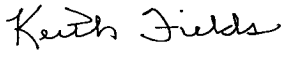
Concurrence by:

_____ February 19, 2016

Sanjaya Ranasinghe, CSP, CHMM
Health and Safety Program Manager / Plan Approver
Tidewater, Inc.
Office (410) 540-8700; Cell (410)-814-8558

Date

Approved by:



_____ February 19, 2016

Keith Fields, PE PMP
Project Manager
Tidewater, Inc.
Office (614) 792-2897; Cell (614) 348-8939

Date

1.0 BACKGROUND INFORMATION

1.1 Introduction

TI2E JV, LLC, (an SBA-approved joint venture between Tidewater, Incorporated [Tidewater] and Inspection Experts, Incorporated [IEI]) has prepared this Accident Prevention Plan (APP) and Site Safety Health Plan (SSHP) [Attachment 1] for implementation during Environmental Remediation Services (ERS) activities at the Former Niagara Falls-Buffalo Defense Nike Battery BU-34/35 (Nike Site) located in East Aurora and Orchard Park, New York. The field efforts will be performed under the U.S. Army Corps of Engineers New England District (USACE) Contract No. W912DR-13-D-0013.

The purpose of this APP/SSHP is to protect human health and the environment from the risks associated with field activities at Former Niagara Falls-Buffalo Defense Nike Battery BU-34/35 located in East Aurora and Orchard Park, New York.

1.2 Purpose and Objective

TI2E will perform field activities in accordance with the United States Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities; the National Institute of Occupational Safety and Health (NIOSH) / Occupational Safety and Health Administration (OSHA), October 1985; Title 29, Code of Federal Regulations (CFR), 1926.65, 1910.120, 1910.165, 1910.1030, 1910.1200, 1910.134; the United States Army Corps of Engineers (USACE) Safety and Health Requirements Manual, EM-385-1-1, (2008); and any other relevant Federal, State, and local regulations.

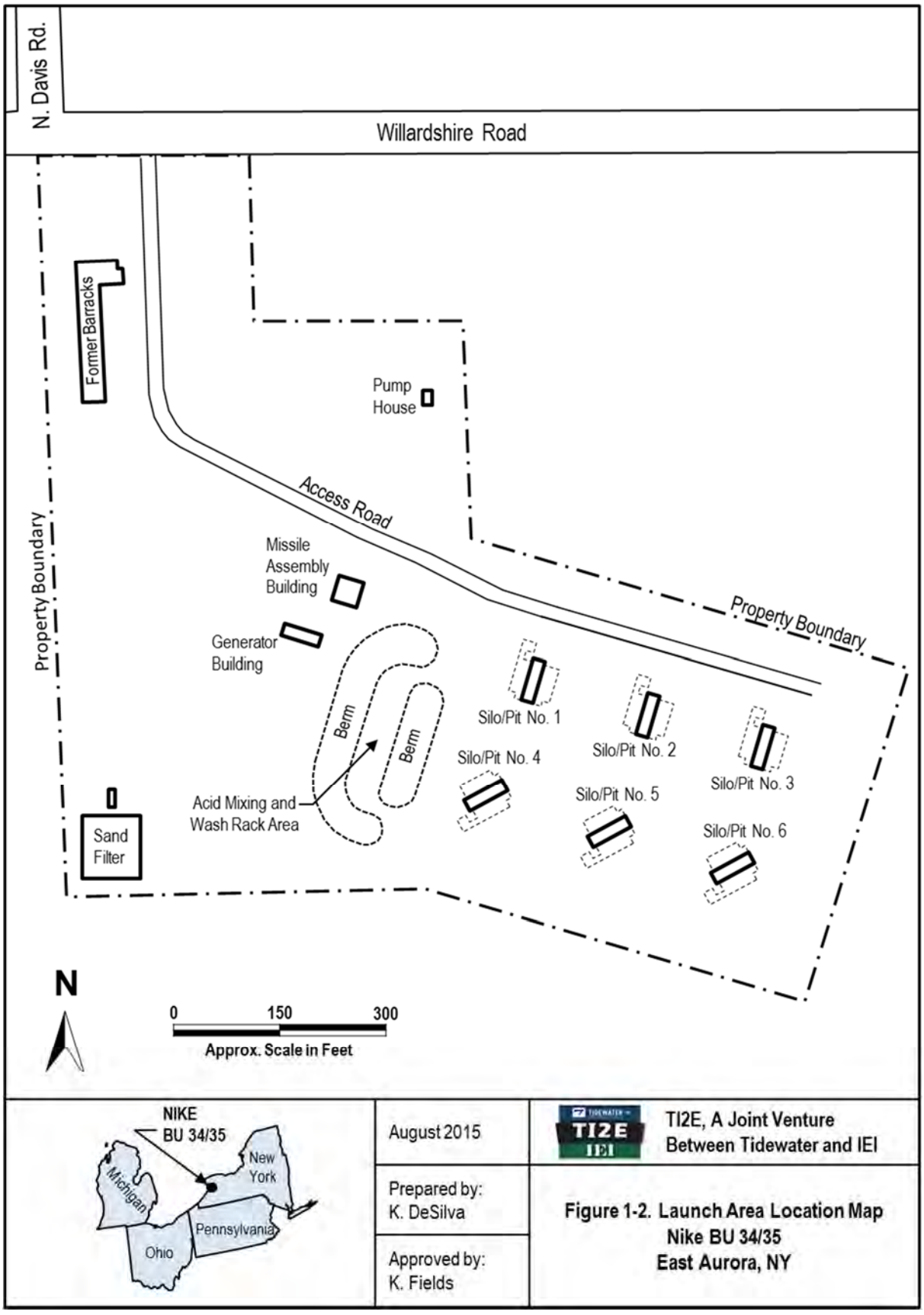
The purpose behind the preparation of this APP, is to ensure contractor and subcontractor compliance to procedures and standards described in the USACE Safety and Health Requirements Manual, EM 385-1-1 (2008). The objectives of this APP/SSHP are to identify the potential safety hazards associated with site activities, confirm that precautions for safe fieldwork are in place, and to assure that appropriate health and safety procedures are identified to protect personnel. Additionally, the APP will outline the necessary protection to prevent damage, injury, or loss of property and equipment and to respond quickly and effectively to emergency related situations.

1.3 Site location and Background

The Niagara Falls-Buffalo Defense Nike Battery BU-34/35 is located in Erie County, New York and consists of two operational areas located on separate parcels of land. These include the battery control area (Control Area) (also called Integrated Fire Control), and the launch area (Launch Area) with underground missile magazines (also called silos in previous reports), launchers, and adjacent assembly, missile fueling, and service areas. The Control Area is a 25.65-acre parcel of land located at 3270 Transit Road in Orchard Park, New York. The Launch

Area is a 19.84-acre parcel of land located at 601 Willardshire Road near the intersection of North Davis Road in the Town of Aurora, New York. The Control Area and Launch Area location maps are shown in Figures 1-1 and 1-2, respectively. A detailed summary of the ite history and previous investigations at each site are provided in the Remedial Investigation (RI) Work Plan for the Niagara Falls-Buffalo Defense Nike Battery BU-34/35.


Transit Rd
Property Boundary (Approximate)
Missile/Target Tracking Radar
Battery/Radar Control
Acquisition Radar
Diesel Generator
Missile/Target Tracking Radar
Sewage Treatment Plant
Admin./Supply
Mess Hall
Officers Qrts.
Enlisted Barracks
Missile/Target Tracking Radar
Diesel Generator
Acquisition Radar
Battery/Radar Control
Missile/Target Tracking Radar
0 100 200
Approx. Scale in Feet
N
NIKE BU 34/35
Michigan
New York
Pennsylvania
Ohio
August 2015
Prepared by: K. DeSilva
Approved by: K. Fields
TI2E, A Joint Venture Between Tidewater and IEI
Figure 1-1. Control Area Location Map
Nike BU 34/35
Orchard Park, NY


N. Davis Rd.
Willardshire Road
Former Barracks
Pump House
Access Road
Property Boundary
Property Boundary
Missile Assembly Building
Generator Building
Berm
Berm
Silo/Pit No. 1
Silo/Pit No. 2
Silo/Pit No. 3
Silo/Pit No. 4
Silo/Pit No. 5
Silo/Pit No. 6
Acid Mixing and Wash Rack Area
Sand Filter
N
0
150
300
Approx. Scale in Feet
NIKE BU 34/35
Michigan
New York
Pennsylvania
Ohio
August 2015
Prepared by: K. DeSilva
Approved by: K. Fields
TI2E, A Joint Venture Between Tidewater and IEI
Figure 1-2. Launch Area Location Map
Nike BU 34/35
East Aurora, NY

1.4 Scope of Work

The scope of work (SOW) for field activities at the Former Niagara Falls-Buffalo Defense Nike Battery BU-34/35 the Nike sites will be implemented in accordance with the Remedial Investigation Work Plan for ERS. Following the collection of historical information on the site,, which includes the following activities will be carried out at the Launch Area:

- Locate and evaluate condition of existing monitoring wells, sand filter, pump house assembly, and silo pits
- Perform Utility Location
- Install at least 3 new borings/monitoring wells (additional if warranted by site conditions)
- Evaluate soil and groundwater chemical composition at existing and new soil borings/monitoring wells
- Install 3 test pits
- Conduct silo/pit investigation including collection of water samples from each silo/pit
- Conduct Site Survey

1.5 Site Activities Requiring an Activity Hazard Analysis

Work phases that require an activity hazard analysis (AHAs) include the following:

1. Scan, Locate and Mark Utilities
2. Mobilization and Demobilization
3. Drilling (Well Installation and Abandonment)
4. Soil and Groundwater Sampling Activities
5. Equipment Decontamination
6. Investigation Derived Waste (IDW) Removal and Disposal
7. Surveying
8. Test Pit Installation

Refer to Section 9.0 of this APP, Risk Management Processes, and to the SSHP (Attachment 1 to this APP) for the detailed AHAs.

2.0 STATEMENT OF SAFETY AND HEALTH POLICY

TI2E is committed to providing a safe and healthful workplace for all employees. It is the company policy that every employee is entitled to work under the safest and most healthful possible conditions for the construction industry. To this end, TI2E will make every reasonable effort in the interest of accident prevention, fire protection, and health preservation.

TI2E has implemented a Corporate Safety and Health Program that applies to all field projects. Personnel will observe the rules and procedures in this program as a moral and legal responsibility, and as a sound business policy. It is TI2E's goal to maintain an effective safety program to guard against any accidents, injuries, and illnesses. TI2E's staff has the responsibility of preventing incidents or conditions that could lead to occupational injuries or illness, for developing the proper attitude toward accident prevention, recognizing hazards, and ensuring that all operations are performed with the utmost regard for safety. TI2E's health and safety forms and accident reporting procedures are provided in Attachments 2 and 3, respectively.

While the ultimate success of a safety and health program depends upon the full cooperation of each individual employee, it is management's responsibility to provide a safe environment in which to work. Good health and safety practices are an integral part of quality control, cost reduction, and job efficiency. Supervisors are accountable for the safety performance demonstrated by employees under their supervision, and they have a goal of zero accidents for this and all contracts. On each job, the Site Safety and Health Officer (SSHO) is responsible for implementing the safety program. All employees shall adhere to the rules, regulations, and other provisions of our safety program. TI2E's Corporate Safety and Health Program objectives are to:

- Promote the health and safety of TI2E and other personnel where there is a potential for exposure to hazardous substances, equipment, or procedures (material safety data sheets (MSDSs) are provided in Attachment 4);
- Work in such a manner as to prevent health and safety related incidents and injuries;
- Adhere to the anticipated work procedures as stated in the AHAs;
- Control losses and liability incurred through damage or injury to personnel or equipment;
- Comply with professional guidelines and governmental regulations including but not limited to:
    - The Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS)
    - The Resource Conservation and Recovery Act (RCRA)
    - The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
    - The National Oil and Hazardous Substance Contingency Plan
    - The Toxic Substances Control Act

  - OSHA, including CFR 1910 and CFR 1926
  - Department of Transportation (DOT) regulations
  - State of New York Department of Environmental Conservation (NYSDEC) requirements; and
- Comply with client-specific health and safety requirements as appropriate, such as the USACE Safety and Health Requirements Manual EM-385-1-1 (USACE, 2008).

Other general references for use as guidance when implementing this APP/SSHP include:

- United States Environmental Protection Agency (U.S. EPA) Office of Superfund Remediation and Technology Innovation
- U.S. EPA. The Decontamination of Response Personnel, Field Standard Operating Procedures; 29 CFR 1910.120 App D, References, 1987
- Hazardous Response Support Division. §5192. Hazardous Waste Operations and Emergency Response, Appendix D, Subchapter 7, Group 16, Article 109, December 1984
- OSHA Instruction DTS CPL 2.74 – 29 January 1986. "Hazardous Waste Activity Form, OSHA 175. 4." Hazardous Waste Inspections Reference Manual. United States Department of Labor
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. 1985. 29 CFR 1910.120 App D
- U.S. EPA. Protecting Health and Safety at Hazardous Waste Sites: An Overview. EPA/625/9-85/006, September 1985
- OSHA Instruction DFO CPL2-2.37A. Technical Assistance and Guidelines for Superfund and Other Hazardous Waste Site Activities, January 29, 1986

3.0 RESPONSIBILITIES AND LINES OF AUTHORITY

The safety and health of every employee of TI2E and its subcontractors is of primary importance. Therefore, it is TI2E's ultimate responsibility to implement its Safety and Occupational Health program to the fullest. All work performed will have a designated competent person present on the job site. The following sections list the personnel that are competent persons and the lines of authority.

3.1 Identification and Accountability of Personnel Responsible for Safety

Project personnel who play a vital role in the project safety and health program will have a copy of this APP/SSHP. Qualifications shall include the OSHA 30-hour course or equivalent course area as listed below:

(1) OSH Act/General Duty Clause
(2) 29 CFR 1904, Recordkeeping
(3) Subpart C: General Safety and Health Provisions, Competent Person
(4) Subpart D: Occupational Health and Environmental Controls, Citations and Safety Programs
(5) Subpart E: PPE, types and requirements for use
(6) Subpart F: Understanding fire protection in the workplace
(7) Subpart K: Electrical
(8) Subpart M: Fall Protection
(9) Rigging, welding and cutting, scaffolding, excavations, concrete and masonry, demolition; health hazards in construction, materials handling, storage and disposal, hand and power tools, motor vehicles, mechanized equipment, marine operations, steel erection, stairways and ladders, or confined spaces.

3.1.1 Contractor

TI2E is the prime contractor responsible for conducting work, directing subcontractors, and implementing the APP/SSHP. Mr. Keith Fields, the Project Manager (PM), has the overall responsibility of safety and health on this project. Mr. Fields possesses the knowledge and experience necessary to ensure that all elements of the approved APP/SSHP are implemented, and enforced on site. He will be assisted by Mr. Bob Janosy PG, the SSHO, and Mr. Ben Headington PMP, the alternate SSHO. The resume of the SSHO is provided in Attachment 5. The competent person listing and competency verification documentation are provided in Attachment 6.

3.1.2 Project Manager

The PM, Mr. Keith Fields, Professional Engineer (PE), has primary responsibility for fulfillment of contract terms and oversight of operations to verify that all legal and safety requirements are

met. The PM has the responsibility to keep the project on schedule and within budget and communicate with the client regarding progress toward specified goals. The PM will have primary responsibility to satisfy the technical and administrative requirements of the project and will provide direction and oversight to the SSHO. The PM will be responsible for communicating progress and any problems to the USACE Project Manager (USACE PM). The PM is trained in Hazardous Waste Operations and Emergency Response (HAZWOPER) and receives the annual 8-hour HAZWOPER refresher training. The PM is responsible for procuring and providing the proper safety equipment at the site.

3.1.3 Site Health and Safety Officer

The SSHO and Alternate SSHO, Mr. Bob Janosy PG and Mr. Ben Headington PMP, respectively, are responsible for implementing and directing this plan. The SSHO is the project Competent Person (CP); one who is capable of identifying existing and predictable safety hazards in the field area; working conditions which are unsanitary, hazardous, or dangerous to employees; and one who has authorization to take prompt corrective measures to eliminate or mitigate these conditions. The SSHO is responsible for identifying safety and health hazards that may impact site personnel, ensuring all assigned personnel in the medical surveillance program are current with their medical evaluations, providing hazard communication information, training employees in safe operating procedures, emergency response, reviewing accident reports, and reviewing inspection results. The SSHO will conduct safety briefings for all personnel working or entering the site. The SSHO is also responsible for advising the Health and Safety Program Manager (HSPM) and PM on matters concerning the safety and health of employees or the public. The SSHO may be required to perform various types of area or personnel monitoring to verify worker exposure and ensure the proper selection of personal protective equipment (PPE). The SSHO will be consulted before any changes in the recommended procedures or levels of protective clothing are made. The SSHO will ensure a portable eye wash station meeting American National Standards Institute Standard 358.1-2004 minimum standards will be available on-site at all times. The SSHO has the authorization to stop work if the determination that an imminent safety hazard or potentially dangerous situation exists. Work cannot be resumed until the situation has been fully assessed and cleared by the SSHO.

3.1.4 Health and Safety Program Manager/CSP

The HSPM, Mr. Sanjaya Ranasinghe, is a Certified Safety Professional (CSP) who will provide professional support by reviewing all safety and health programs as they apply to this project. The HSPM will approve the APP and SSHP and all modifications to the plan as they affect the safety and health of field personnel. The HSPM will be consulted on matters relating to emergency response and will provide directions for upgrading and/or downgrading of protection levels as needed.

The HSPM is responsible for providing professional safety and health support and oversight management to the SSHO. The HSPM will review and provide support in all concerns regarding the safety and health of field personnel assigned to the project. The HSPM will be responsible for evaluating air-monitoring data and recommending changes in exposure control methods as needed. The HSPM will ensure that all project personnel have relevant and current safety and health training and that training is documented. Periodic field audits of the project work site may be conducted by the HSPM to evaluate the adequacy of the program and implement any necessary changes. The HSPM will review accident reports and the results of inspections.

3.1.5 Project Field Staff

The project field staff is responsible for ensuring that activities are performed in accordance with the APP/SSHP/AHAs and that deviations from the plan are based upon field conditions encountered, have been approved by the PM and/or SSHO, and that the information is well documented in field notes. Field staffs' health and safety responsibilities include:

- Following the APP/SSHP/AHAs;
- Following the Corporate Health and Safety Program;
- Reporting to the SSHO any unsafe conditions or practices;
- Reporting to the SSHO all facts pertaining to incidents that result in injury or exposure to toxic materials or chemicals of concern (COCs);
- Reporting equipment malfunctions or deficiencies to the SSHO;
- Reviewing the APP/SSHP in the field, as necessary;
- Attending the daily pre-work safety tailgate meetings;
- Attending the scheduled health and safety training classes; and
- Attending all scheduled medical examinations.

It is the responsibility of individual organizations involved in the field activities to ensure understanding of and compliance with the APP/SSHP by its on-site employees or representatives working in controlled areas. Failure by any person to adhere to this plan may result in removal from site activities.

3.2 Pre-Task Safety and Health Analysis

Prior to the commencement of field work and at the beginning of each task a Competent Person will conduct a jobsite safety audit and document his/her findings on the Safety Inspection Form included in Attachment 2. The audit will cover all aspects of the work to be conducted, and ensure that:

- All safety equipment is available and in working order;
- This APP/SSHP are on site and available for all employees to use;
- Emergency routes are posted; and

- Emergency contact information is posted.

All activities that could pose a hazard are addressed in the AHAs.

3.3 Lines of Authority for Project Safety

The following flow chart provides a graphic presentation of the lines of authority for project safety.

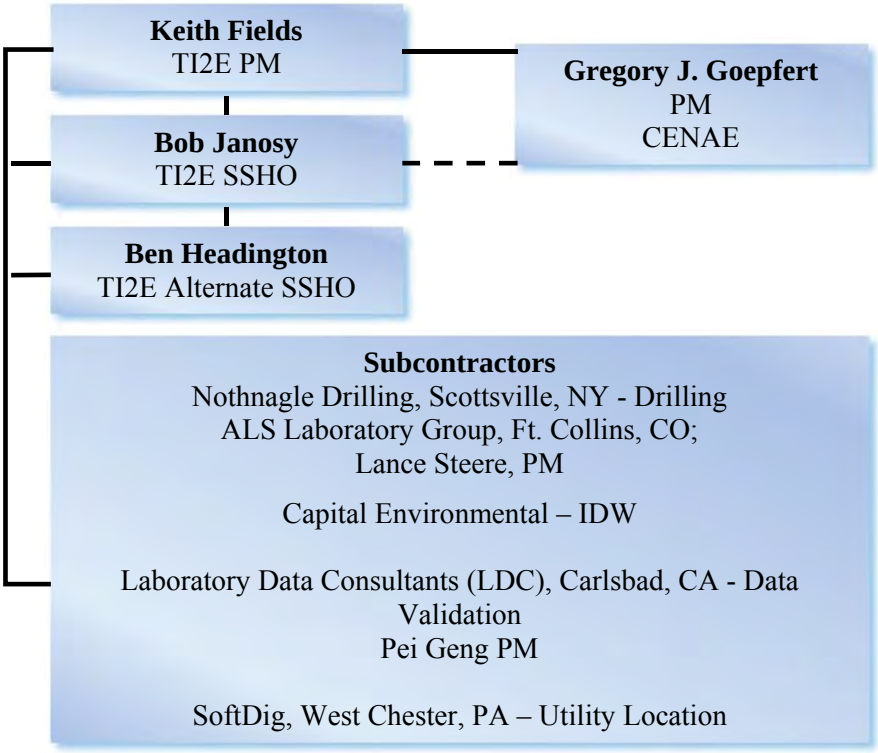


Figure 3-1: Project Organization

3.4 Policies and Procedures Regarding Noncompliance with Safety Requirements

Whenever a violation of safety policy occurs and requires correction, the SSHO will document the situation and request the subcontractor's competent person to initiate corrective action. Corrective action will be documented with further explanation given in the daily project notes. If immediate corrective action is not taken by the subcontractor, they will be notified in writing using the Safety/Health Violation Notice. The SSHO and PM will be informed of the action taken within 24 hours of the violation. The involvement of the PM is essential to ensuring that there are no additional violations of safety policies at the work site. TI2E reserves the right to immediately remove any personnel from the site for a serious violation of safety requirements.

3.4.1 Subcontractors First Violation of a Rule or Regulation

A subcontractor employee who is cited for a first-time notice of a Safety/Health Violation Notice shall be immediately removed from the site, and shall not be permitted to return to work for a period of at least 24 hours, missing the next full workday. For example, if an employee was cited on a Friday afternoon, they would leave the site that day and would not be permitted to return to work until Tuesday morning.

3.4.2 Subcontractors Second Violation of a Rule or Regulation

A subcontractor employee responsible for a repeat offense or receiving a second Safety/Health Violation Notice shall be immediately and permanently removed from the site for the remainder of the contract period. This requirement may only be waived if the subcontractor demonstrates, on behalf of the employee, extenuating or mitigating circumstances, and obtains a waiver from the TI2E SSHO and/or PM.

3.5 Safety Accountability for Managers and Supervisors

The following has been adopted into TI2E's Policies and Procedures Manuals:

"First line supervisors and management, site managers, department managers, and safety representatives are responsible for enforcing all safety and health policies. TI2E will take disciplinary action against employee-owners for failing to enforce such policies." TI2E will follow the violation procedures discussed for subcontractors with their own employees.

Also, the following statement was adopted into the policy: "TI2E reserves the right to dismiss employee-owners who commit serious or repeat safety or health violations."

4.0 SUBCONTRACTORS AND SUPPLIERS

All subcontractors and suppliers will be provided with a copy of this APP/SSHP. Subcontractors will review the plan with their employees and each individual will be expected to sign the signature sheet provided in Attachment 2, certifying that they have read, understand, and will comply with the requirements of this plan. Subcontractor personnel are expected to attend and document all daily health and safety briefings while working on the site. All suppliers and visitors will be made aware of any existing hazards by on-site personnel. TI2E has the authority to shut down field activities if site work operations pose imminent danger or are immediately dangerous to life or health. When such precautions must be taken, the SSHO shall be immediately notified and actions to remedy the situation shall be implemented. If applicable, TI2E will provide procedures for coordinating health and safety activities with other employers at the site.

TI2E requires its subcontractors to work in a responsible and safe manner. Subcontractors for this project will be required to adhere to applicable requirements set forth in USACE Safety and Health Requirements Manual, EM 385-1-1 (2008).

The subcontractors for this field effort include:

- Drilling and Excavation Firm, Nothnagle Drilling, Scottsville, NY
- Analytical Laboratory – ALS Laboratory Group, Ft. Collins, CO
- Investigation-Derived Waste (IDW) Pickup and Disposal – Capital Environmental (nationwide broker).
- Independent Third-Party Data Validation – Laboratory Data Consultants, Inc., Carlsbad, CA.
- Utility Location – SoftDig, West Chester, PA
- New York-licensed Land Surveyor – To Be Determined (TBD).

The PM will be responsible for coordination and scheduling of all subcontractors for this project. The SSHO will supervise all subcontractor work, and will ensure that health and safety requirements are met. All subcontractors will be responsible for.:

- Obeying safety and health work practices issued by law, by the SSHO, and by the APP/SSHP/AHA document;
- Understanding hazards identified in the AHAs and sign the daily safety meeting forms;
- Wearing PPE as directed by the APP/SSHP/AHA document;
- Using safety equipment as directed by the APP/SSHP/AHA document;
- Informing the SSHO of any prescription medication taken during the project;
- Informing the SSHO immediately of any workplace injury or illness;

- Informing the SSHO of any non-work related physical limitation (injury or illness) that might possibly place one's self, and/or another in jeopardy;
- Reporting recognized unsafe conditions and/or actions to the SSHO; and
- Reporting any accidents, exposures, near misses, or property damage immediately.

All current training certificates and medical surveillance clearances must be on file with the SSHO before any subcontractor's worker may commence work on site

5.0 TRAINING & SAFETY MEETINGS

All TI2E and sub-contracted employees involved in intrusive field work have completed the required Occupational Safety and Health Administration OSHA 40-hour HAZWOPER training, maintain qualification through annual refresher training, are under a program of medical monitoring, and are certified to wear respiratory protection, as specified in 29 CFR Part 1910.134 and 1926.65. Field work that does not pose a risk of coming into contact with potential onsite contamination do not require OSHA 40-hour HAZWOPER training, examples of these activities include: delivery driver, surveyor, utility location, etc.

It is recognized that conditions on a site may change or that more information may become available during the operation. If, during field investigation activities, it is determined that the conditions are not as described, or the protection specified in the APP/SSHP require modifications, work will cease, and the SSHO will contact the PM for guidance. Work will not resume until authorized by the PM.

5.1 General Personnel – Training

All TI2E personnel are required to attend new employee orientation training. This training includes:

- Hazard Communication/Petroleum Hydrocarbons
- Emergency Action Response Procedures
- Basic Safety Training
- A review and discussion of the Corporate Health & Safety Policy

5.2 Field Personnel – Training

Subcontractors are to provide acceptable certification of training for all personnel on-site. At a minimum, all subcontractor personnel will be required to provide 40-hour HAZWOPER Training and applicable 8-hour Refresher Training Certificates prior to the start of fieldwork. These documents will be presented to the SSHO before any field activities take place. Mandatory training (which must be current) required on this project includes:

1. An initial 40-hour HAZWOPER Training Class
   - Workers will have 3 days of on-site, supervised field training.
   - Supervisors will have 3 days of on-site supervised field training with at least 8 additional hours of specialized training at the time of job assignment (i.e., on the following programs: Company's Health & Safety policy, employee training, PPE, spill containment and health hazard monitoring and techniques).

2. An annual 8-hour HAZWOPER Refresher Training class and OSHA Construction Safety Training
   - The SSHO and/or Alternative SSHO shall have completed the 30-hour OSHA Construction Safety Training.
   - Potential Topics covered in these classes include the following:
     - Introduction to OSHA
     - Hazard Communication/Lead and Asbestos
     - Cranes/Rigging
     - PPE
     - Confined Space Entry
     - Legal Issues
     - Fall Protection
     - Electrical Safety
     - Material Handling
     - Excavations, Trenching, and Shoring
     - Ladders/Stairs
     - Scaffolds
     - Steel
     - Demolition

3. At least two (2) personnel with current Adult First Aid/Adult cardiopulmonary resuscitation (CPR) and Bloodborne Pathogens Training (in accordance with 29 CFR 1910.1030 and 8 CCR 5193), will be on-site at all times during site work.

4. Hazard Communication Training

5. PPE Training

6. The SSHO or his/her alternate will be the competent person on-site when any fieldwork associated with this project is being conducted. The competent person will have experience in mobilization, site set up, soil sampling, use of protective systems, and requirements of 29 CFR 1926.650-652.

7. All heavy equipment operators will have received proper training and have extensive experience. No certification and/or licensing are required for heavy equipment operators. Drillers will possess a current drilling license.

At a minimum, the SSHO will possess a 40-hour HAZWOPER certificate and be current on HAZWOPER annual refresher training, an 8-hour Site Supervisor Health and Safety certificate, and will have successfully completed the OSHA 30-hour Construction Safety course. In

addition, the SSHO will have at least 1 year of experience working on hazardous waste sites. Any designee will have similar credentials.

Records of employee qualifications are kept in the TI2E corporate office.

5.3 Daily Safety Training/Tailgate Meetings

The SSHO will conduct daily site safety meetings for all employees at the start of the workday to discuss site-specific concerns. All TI2E field staff and subcontractor staff are required to attend the daily site safety meetings, and attendance records will be documented. More frequent site safety meetings may be scheduled by the SSHO, PM, or HSPM/CSP if a potential safety issue is identified that has not been addressed previously and/or if a situation warrants an immediate stop work and correction response. Training involving site specific or task specific PPE and/or safety requirements will be discussed during the daily safety meetings.

Subjects typically covered in the daily site safety meetings include the following:

1. A summary of planned activities for the day, including a review of the related AHAs
2. Potential physical and chemical hazards associated with the planned activities
3. Review of proper lifting techniques
4. PPE and auxiliary equipment
5. Emergency response procedures for potential chemical, physical, and environmental hazards
6. Deficiencies noted and corrections scheduled or made
7. Related refresher training for job tasks that the SSHO or PM or HSPM/CSP have noted to be weak or substandard or non-routine
8. Near-miss events, accidents and/or injuries/illnesses
9. A review of the on-site MSDSs (Attachment 4) and their location
10. Related weather concerns (i.e., wind, storms, snow, cold or heat stress)
11. Review of the name, address, phone number, and location of the map showing directions to the hospital (Figure 8-1 and Figure 8-2 of SSHP)

Copies of training documentation and required certifications will be available on-site by the SSHO.

6.0 SAFETY AND HEALTH INSPECTIONS

The SSHO or his/her designee and/or competent person (for specific job tasks) will conduct daily safety inspections of the project site, and will take appropriate measures to ensure the safety of site personnel and the public. Inspections to be performed include:

- General site conditions and housekeeping;
- Emergency phone numbers posted;
- Proper PPE worn by all personnel;
- Weather forecast;
- Location of utilities; and
- Heavy equipment location.

All subcontracted personnel will be required to perform their own daily equipment/task inspections. Drilling subcontractors will provide their own checklist/inspection form for the drilling operations per the requirements of Section 1.8H of EM 385-1-1. Furthermore, subcontracted personnel will provide their own checklist/inspection form for IDW storage tanks and associated piping.

Results of the inspections will be documented daily on the safety inspection form (included in Attachment 2) by the SSHO/CP and filed in the contractor production reports. Deficiencies will be addressed immediately in the field by the SSHO, reported to the HSPM/CSP and the PM, and documented. The SSHO will maintain a list of deficiencies, the date and time that the deficiency was observed, and the date and time that the deficiency was corrected. If the deficiency jeopardizes the health and safety of site workers or the public, work will be suspended until the deficiency is corrected. The SSHO, with assistance from the PM, will be responsible for ensuring that all deficiencies are addressed to maintain a safe work environment in accordance with the requirements of the APP/SSHP/AHAs.

The HSPM will help ensure that the requirements of the corporate health and safety program and this APP/SSHP/AHAs are being followed. If the HSPM finds any discrepancies, he will document them, and forward them to the PM, and discuss them with the SSHO. Proof of qualifications of all personnel involved in safety inspections must be presented to the SSHO prior to the initial equipment inspection. All equipment being utilized on site will be inspected daily prior to the resumption of the day's work. Each inspection must be performed by a qualified person.

In order to promote a safe work environment, the SSHO will encourage the performance of individual safety inspections by each site worker on a daily basis in their respective work environments. This additional time spent by each individual on the health and safety issues that

affect them the most should translate into each worker providing a safer working environment for themselves and, by the communicative nature of safety, overall a safer site for all workers.

If at any time a site worker believes that a work situation (i.e., action or condition) is unsafe, one for which they were not properly trained, presents a hidden hazard for which they are not trained, or do not have the appropriate PPE, they may decline to start the job or safely cease the job task. They can request that the SSHO or PM review the situation without fear of reprisal. The job task in question or under investigation will not be commenced until the PM determines that it is safe to do so (i.e., the corrections have been made or the employee has been informed why the situation is not the concern it was perceived to be). To summarize, the qualified person responsible for the general daily site inspections is the SSHO/competent person.

7.0 ACCIDENT REPORTING

The SSHO shall keep records of exposure data (man-hours worked) on a regular basis. All onsite man hours will be submitted to Ms. Penelope Reddy on the fifth day of the month for the previous month. In the event of an accident (regardless of its severity), it shall be reported as soon as possible to the SSHO. The responsible party will then contact and report the accident immediately (within 4 hours) to the USACE PM and the Contracting Officer Representative (COR). The responsible party will provide a written accident report and appropriate corrective action to the COR and TI2E within five working days. TI2E will complete and send both an Incident Report (Attachment 2) and a completed USACE Accident Investigation Report (ENG Form 3394; Attachment 3) to the PM. For major accidents, the SSHO will notify the PM immediately of the event. An Incident Report and an ENG Form 3394 will be completed and sent to the PM. The PM is responsible for contacting the USACE PM.

Records of occupational injuries and illness will be maintained in compliance with federal and state occupational health and safety regulations. If a TI2E employee or subcontractor receives a physical or chemical injury or other job-related illness, the employee will obtain initial jobsite treatment as soon as possible.

7.1 TI2E Incident/Accident Reporting Procedure

Following an incident that results in a physical or chemical injury or chemical exposure, the following procedures and documentation requirements shall be followed:

- All accidents or near miss incidents regardless of the severity of the injury must be reported to the supervisor, SSHO or PM immediately.
- An Accident/Incident Report form must be completed within 24 hours of the event and copies submitted to the HSPM within 72 hours.
- The following injuries require immediate OSHA and governmental accident notification: fatal injury, a permanent total disability, a permanent partial disability, hospitalization of three or more persons resulting from a single accident, and an incident resulting in property damage of $200,000 or more.
- Standard OSHA accident and injury reports will be made and logs maintained.
- All paperwork resulting from an accident or injury will be maintained in the corporate office.
- Where required by the client, injury reports will be submitted to the designated client representative.
- Injuries on the road will be handled on a case-by-case basis. Regardless of where the individual receives treatment, the supervisor, manager, and/or foreman must complete the Accident/Incident Report.

- When the injured individual returns to work, he or she must turn in all paper work from the doctor and treatment facility to the SSHO or PM.
- The PM must submit the Accident/Incident report to the HSPM.
- If an accident involves a work-related fatality, the PM must also notify OSHA within 8 hours of the occurrence of the accident. All work-related in-patient hospitalizations, amputations, and loss of an eye must be reported to OSHA within 24 hours of such occurrence."
- The HSPM will review the Accident/Incident report, treatment facility reports, doctor's evaluation, any other paperwork, and if applicable, complete a formal accident investigation.
- Based on the information gathered and reviewed by the HSPM, it may be applicable to complete a First Report of Injury for submittal of the claim to the insurance company.
- The HSPM will determine if the injury is recordable on the OSHA Accident & Injury Log.

8.0 REQUIRED SAFETY PLANS

Based upon the risk assessment and site survey of the contracted work activities and scope of work, the applicable safety plans were included in the production of this APP and its attachments (i.e., the SSHP/AHAs). The risk/accident prevention plans that were determined to be applicable to this contract are incorporated into the SSHP/AHAs and are as described below. These plans include:

1. Layout Plans
2. Emergency Response Plans
    a. Procedures and Tests
    b. Spill Plans
    c. Firefighting Plans
    d. Posting of Emergency Telephone Numbers
    e. Man Overboard/Abandon Ship (not applicable [N/A])
    f. Medical Support
3. Plan for Prevention of Alcohol and Drug Abuse
4. Site Sanitation Plan
5. Access and Haul Road Plan (N/A)
6. Respiratory Protection Plan (N/A)
7. Health Hazard Control Plan
8. Hazard Communication Program
9. Process Safety Management Plan (N/A)
10. Lead Abatement Plan (N/A)
11. Asbestos Abatement Plan (N/A)
12. Radiation Safety Program (N/A)
13. Abrasive Blasting Plan (N/A)
14. Heat/Cold Stress Monitoring Plan
15. Crystalline Silica Monitoring Plan (Assessment)
16. Night Operations Lighting Plan (N/A)
17. Fire Prevention Plan
18. Wild Land Fire Management Plan (N/A)
19. Hazardous Energy Control Plan
20. Critical Lift Procedures (N/A)
21. Contingency Plan for Severe Weather
22. Float Plan (N/A)
23. Site-Specific Fall Protection Plan (N/A)
24. Demolition Plan (N/A)
25. Excavation/Trenching Plan (N/A)
26. Emergency Rescue Plan
27. Underground Construction Fire Prevention and Protection Plan (N/A)
28. Compressed Air Plan (N/A)

29. Formwork and Shoring Erection and Removal Plan (N/A)
30. Precast Concrete Plan (N/A)
31. Jacking Plan (Lift) Slab Plan (N/A)
32. Steel Erection Plan (N/A)
33. Site Safety and Health Plan
34. Blasting Plan (N/A)
35. Diving Plan (N/A)
36. Confined Space (N/A)
37. Exposure Control Plan/Blood-borne Pathogen Prevention Plan

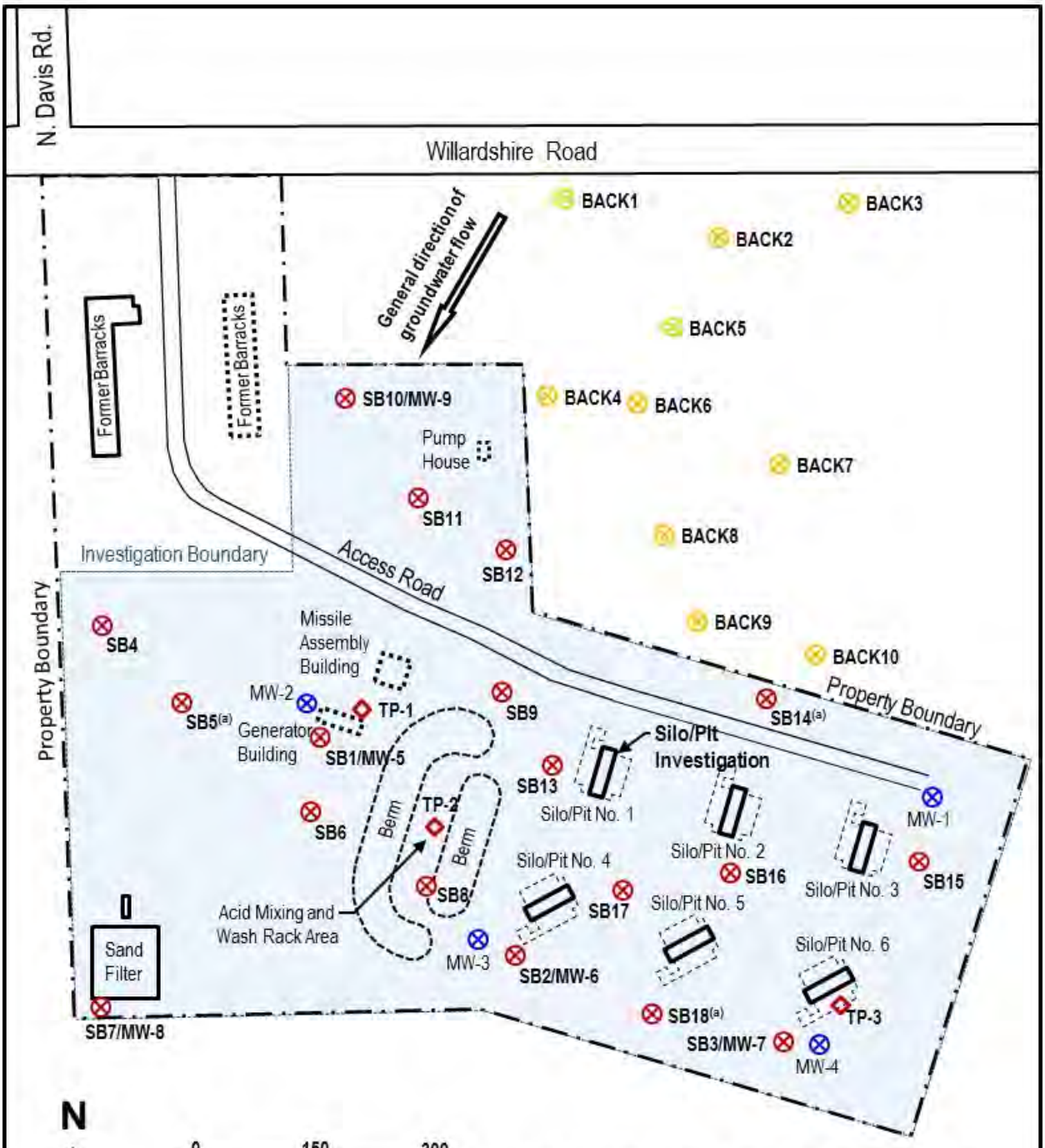
8.1 Layout Plans

A site layout plans have been developed for the launch area and is presented in Figure 8-1.

The work areas on this project will be established in order to allow the workers sufficient room to safely work and operate the necessary equipment, while minimizing intrusion into unrelated work areas. The site work areas will require formal establishment and boundary delineation of an EZ, CRZ, and SZ. For general site and worker safety, non-essential workers and visitors will be excluded from the EZ and CRZ.

Temporary site fencing and delineators with CAUTION tape will be used to denote the EZ and CRZ during work activities. Non-qualified personnel will not enter the EZ; if necessary, they will be briefed in the SZ. Qualified non-essential personnel arriving as visitors may enter the work zone only when escorted by qualified personnel at all times. Site security will be maintained during working hours by the SSHO, who will ensure that all personnel entering a given work zone are wearing the proper PPE and have been trained and medically cleared to enter the area. The SSHO will also ensure that all other health and safety precautions are in place prior to entry by site personnel. All personnel entering the EZ will be required to sign the Site Control Log (Attachment 2) when entering and exiting. The SSHO and operators will keep laborers a safe distance from the heavy equipment and project boundaries during all operations. Site safety and health procedures will be discussed daily in the morning safety meetings and monitored by the SSHO throughout the project.

The SZ will be located outside of the CRZ, and it will not be further delineated. First-time or unknown visitors will be contacted by the SSHO as part of site security, and asked the nature of their visit. The SZ will be used as the staging area for site operations and for other support functions required to maintain smooth operations on site. The SZ includes equipment loading and unloading for site deliveries, the personnel lunch and break areas, and personnel restrooms.


N. Davis Rd.
Willardshire Road
General direction of groundwater flow
Former Barracks
Former Barracks
BACK1
BACK2
BACK3
BACK4
BACK5
BACK6
BACK7
BACK8
BACK9
BACK10
SB10/MW-9
Pump House
SB11
SB12
Investigation Boundary
Access Road
Property Boundary
Property Boundary
SB4
Missile Assembly Building
MW-2
TP-1
SB5(a)
Generator Building
SB1/MW-5
SB9
SB14(a)
Silo/Pit Investigation
SB13
Silo/Pit No. 1
MW-1
SB6
Berm
TP-2
Berm
Silo/Pit No. 2
SB16
Silo/Pit No. 4
Silo/Pit No. 3
SB15
SB8
SB17
Silo/Pit No. 5
Acid Mixing and Wash Rack Area
Sand Filter
MW-3
SB2/MW-6
Silo/Pit No. 6
SB18(a)
TP-3
SB3/MW-7
MW-4
SB7/MW-8
N
0
150
300
Approx. Scale in Feet
Note: Soil samples representative of near surface (0-2 in bgs), surface (0-1 ft bgs), fill (2-8 ft bgs), and native material (8-15 ft bgs) will be collected from soil borings consistent with Table 3-2.
LEGEND
Existing Monitoring Well
Proposed Boring/Monitoring Well
Proposed Background Boring
Proposed Test Pit
(a) Locate boring within drainage ditch based on field observations
February 2016
TI2E, A Joint Venture Between Tidewater and IEI
Prepared by: K. DeSilva
Approved by: K. Fields
Figure 8-1. Proposed Locations for Borings/Monitoring Wells and Test Pits
Launch Area, Nike BU 34/35
East Aurora, NY

8.2 Emergency Response Plan

The SSHO or the alternate SSHO will also serve as the Emergency Response Coordinator (ERC) for this project. The emergency response plan for the project is discussed below and explained in Section 8.0 of the SSHP (Attachment 1).

8.2.1 Procedures and Tests

This subsection describes emergency response procedures to be implemented for the site. This section is consistent with the requirements of 29 CFR 1910.120/1926.65 and local, state, and federal disaster and emergency management plans. This emergency response plan will be implemented at the site to prevent or minimize the impacts of unplanned events that could affect the safety and health of site workers or base personnel. The subsection includes:

- Critical operations
- Pre-emergency planning
- Personnel roles and lines of authority
- Emergency recognition and prevention
- Escape procedures and routes
- Emergency contacts and notifications
- Hospital route directions
- Emergency medical treatment procedures
- Protective equipment failure
- Fire or explosion
- Weather-related emergencies
- Spills or leaks
- Emergency equipment and facilities
- Reporting

All employees working at the site will receive training on the emergency response plans, the evacuation route, and meeting place during their initial site safety briefing and will be reminded of these provisions and updated on any changes during the regular daily tailgate safety meetings. The SSHO will review these emergency plans on a regular basis to ensure that they are adequate and consistent with the current site conditions. The plan will be amended, if necessary, to keep current with new or changing site conditions or information.

The SSHO/ERC has the primary responsibility for responding to and correcting emergency situations and for taking appropriate measures to ensure the safety of site personnel and the public. The SSHO/ERC will have the authority to cease any response activity if the safety of responders, site personnel, or the public is threatened. The SSHO/ERC's duties will include:

- Maintaining emergency preparedness;

- Conducting the pre-work (initial) emergency response plan training to the site workers prior to commencing any job activities;
- Conducting, critiquing, and documenting at least one emergency response drill at the start of this contract;
- Performing site and equipment inspections;
- Informing site workers and subcontractors of work activities and emergency response plans;
- Coordinating with emergency services prior to and during an emergency response scenario;
- Making notifications to appropriate authorities; and
- Preparing follow-up reports.

Site personnel are required to report all injuries, illnesses, spills, fires, and property damage to the SSHO/ERC. The SSHO/ERC must be notified of any on-site emergency and is responsible for ensuring that the appropriate emergency procedures described in this section are followed.

Subcontractors are required to coordinate with the SSHO/ERC concerning activities associated with their individual scopes of work.

Potential emergency scenarios and emergency recognition, prevention, and response guidance for each scenario are included in Table 8-1 of the SSHP (Attachment 1). All on-site personnel will become familiar with this information through pre-work training and tailgate safety meetings. All site personnel and visitors will be made aware of their responsibility in notification and warning of any identified emergency situations.

A communication program including the use of hand signals, 2-way radios, and/or cellular phones among workers shall be implemented during the project. Workers on the ground are to use the “buddy system” at all times and be cognizant of the reduction of communication abilities in high noise areas. The specific hand signals to be used during the projects shall be discussed in the tailgate safety meeting. Hand signals that will be used by site personnel in emergency situations, or when verbal communication is difficult, will include those listed in Table 8-1.

Table 8-1: Hand signals to be used in emergency situations

Signal	Definition
Hands clutching throat	Out of air or cannot breathe
Hands on top of head	Need assistance
Thumbs up	Okay, I am all right, or I understand
Thumbs down	No or negative
Arms waving upright	Send backup support
Fist clenched tight	Exit area immediately

Table 8-1: Hand signals to be used in emergency situations	
Signal	**Definition**
Index and thumb rubbing together	Stop Slowly

In case of an emergency, an air horn shall be used by the SSHO to alert site personnel. The signals listed in Table 8-2 will be used.

Table 8-2: Air horn signals to be used in emergency situations	
Signal	**Definition**
One Short Blast	Warning or Attention, Stand By for Directions
One Extended Blast	Evacuation
Repetitive Short Blasts	Fire
One Short and One Long Blast	All Clear
Short and Long Blasts Repeatedly	Medical Emergency

Any sounding of this device shall be cause to stop work and prepare to mobilize to the predetermined emergency meeting area (unless conditions change, this shall be in the predetermined evacuation meeting location) for further directions or information. Personnel will remain in the emergency meeting area until the SSHO or his authorized representative provides further instructions. A roll call will be conducted to confirm that all workers are mobilized in the respective meeting area.

At least one first aid kit and fire extinguisher will be located in a readily visible area of the site. All workers will be shown the location of the first aid kit and fire extinguisher during the daily tailgate safety meetings. The first aid kit will also contain a first aid manual. A minimum of two personnel trained and certified in adult first aid, CPR, and Bloodborne Pathogens in accordance with 29 CFR 1910.1030, will be on-site at all times that work is being performed.

If an injured individual requires further attention, the individual will be immediately transported to the nearest hospital by ambulance. A map illustrating the route to the nearest emergency hospital will be present on site (Figures 8-1 and 8-2 of the SSHP in Attachment 1). If necessary, the worker will be decontaminated prior to transport to the medical facility. If the injury is serious or life-threatening, decontamination may be delayed. The potential for contamination by a potential COC is extremely low, and the amount and type of the potential contaminant is not expected to be an acutely toxic health hazard on this project. If there is any doubt about the level of contamination, and if decontamination process (time) will increase the possibility of death or permanent disability, then the injured worker will be wrapped (i.e., in plastic or blankets) to protect the emergency transportation personnel and personnel at the medical facility, until he may be decontaminated. A representative of TI2E and a copy of this APP/SSHP will accompany

the injured worker(s) to the medical facility. All accidents, without regard to severity, will be reported in writing to the HSPM/CSP by the PM within 24 hours.

The name, telephone number, and location of police, fire, and other emergency response agencies must be posted on site, or must be readily available at all times. If an emergency vehicle is summoned, TI2E will arrange for a site worker to meet the vehicle at the base gate and escort them to the work site. Additionally, efforts should be made to accommodate their operations in the support zone. Emergency telephone numbers for this project are in Table 8-3 of the SSHP. In the event of a medical emergency, personnel will notify the appropriate emergency organization and will take directions from the SSHO. In the event of a fire, explosion, or spill at the site, the SSHO will notify the appropriate federal, state, and local agencies and will follow the procedures discussed in Table 8-1 of the SSHP. The following emergency equipment will be available at the site:

- First aid kit
- Eye wash (portable)
- Fire extinguisher
- Mobile phone
- Sorbent material, which may include dirt
- Spill kits

All emergency situations require follow-up and reporting. Attachment 2 to this APP includes a copy of TI2E's Injury and Illness Report form. This form must be completed and submitted to the PM within 24 hours of an emergency situation. The PM will review the report and forward it to the HSPM/CSP for review. The report must include proposed actions to prevent similar incidents from occurring. The HSPM/CSP must be fully informed of the corrective action process so that he/she may implement applicable corrective actions at other sites. In addition, the client will be notified of all incidents covered in this plan immediately, and will receive copies of the incident reports within 24 hours.

8.2.2 Spill Plan

All operations, materials, and equipment will be evaluated to determine the presence of hazardous environments, or if hazardous or toxic agents could be released into the work environment. A Spill and Discharge Control Plan will be developed to prevent the contamination of soils, water, atmosphere, uncontaminated areas/surfaces, equipment or material by the uncontrolled release of hazardous waste and materials.

During all site activities, nearby storm drains and catch basins will either be monitored, covered, or absorbent material will be placed around the drain opening. Chemicals or hazardous substances could be spilled during site tasks as a result of either a transportation accident, rupture of underground piping, decontamination of equipment, or improper handling of investigation derived waste during off-loading.

In the event of any spill at the site, the PM or SSHO will be notified immediately by whomever first witnesses the emergency event. As soon as the spill is discovered, all non-essential workers will be directed to evacuate the immediate area to reduce the likelihood of spreading contamination or being exposed to contamination.

The PM or SSHO will remain at the spill area until the area has been cleaned, inspected, and readied for re-entry. In the event of a spill, an incident report will be prepared and available for review.

Due to the nature of the job tasks associated with this contract, a spill event is very unlikely. The following spill control equipment will be available in the event of a liquid or solid spill:

Solid Materials Spill

- Sand, dirt, or other appropriate spill absorbent material
- Shovels
- Decontamination supplies and protective clothing
- Plastic buckets
- Hand operated pump

Regardless of the type of spill (liquid or solid), the following measures will be taken to isolate the spilled material(s):

- Isolate and contain the hazardous spill area
- Restrict access of unauthorized personnel
- Prevent contact with the spilled material
- Relocate upwind and upgradient of the spilled material

- Take air, soil, or appropriate samples to determine if clean-up is complete

Liquid Materials Spill

If the material discharged is the same as in this SOW, and the volume discharged is less than two (2) gallons, then workers will respond with application of absorbent materials and/or booms. The discharged liquid material will be controlled and disposed of as described herein. Liquid spills during remedial action activities should be adsorbed with sand or other appropriate absorbent material. The absorbent material will be containerized in a locking steel drum pending characterization. The final disposition of the containerized material will be determined in conjunction with laboratory analysis of a representative sample.

If the material being discharged is unknown to the site personnel or known but not within their ability to handle (i.e., greater than two gallons), then they will initiate the Emergency Evacuation procedures including notification to the base emergency response personnel. In all cases, the spill response process shall be coordinated with the point of contact (POC) and USACE PM.

8.2.3 Firefighting Plan

TI2E personnel will only attempt to extinguish small incipient fires (i.e., fires that can be extinguished with available portable fire extinguishers). In the event of a large fire or explosion, site evacuation procedures will be implemented and emergency response services will be notified. TI2E will notify the proper authorities and evacuate the site in accordance with the Emergency Response Plan.

8.2.4 Posting of Emergency Telephone Numbers

The name, telephone number, and location of police, fire, and other emergency response agencies will be posted on site or must be readily available at all times. If emergency personnel are called to the site, efforts should be made to accommodate their operations in the support zone. Emergency telephone numbers for this project are presented in Table 8-3 of the SSHP.

8.2.5 Man Overboard/Abandon Ship

No activities associated with the proposed SOW include exposure to a marine environment or use of a floatation device. Therefore, man overboard/abandon ship hazards is not applicable for this site.

8.2.6 Medical Support

Rescue and medical duty responsibilities are to be determined only by trained and competent personnel. A minimum of two employees shall be certified in CPR and first aid per shift/site. The TI2E SSHO and alternate SSHO are trained in CPR and first aid. If the extent of injuries can be treated by first aid medical attention, then a person certified in first aid would administer

medical help. In the event of rescue, immediate notification of the SSHO and the PM will be initiated. The competent person will evaluate the circumstances, and appropriate rescue action will take place if action can be accomplished without endangering employees. If rescue can be conducted safely by trained, competent on-site personnel, then such action will take place. If rescue is determined to require additional assistance, then Fire Department rescue personnel will be notified and dispatched to the jobsite.

On-site Medical Support. In the case of minor injuries, the TI2E SSHO and alternate SSHO are trained in first aid, CPR, and bloodborne pathogens and will provide immediate on-site care. Seriously injured persons should not be moved, unless they are in immediate danger. Table 8-3 of the SSHP contains emergency phone numbers.
Figures 8-1 and 8-2 of the SSHP include hospital route maps and written directions to the closest Emergency Care Facility.

8.3 Plan for Prevention of Alcohol and Drug Abuse

TI2E prohibits the use, possession, or distribution on the project site of any of the following: alcoholic beverages, intoxicants, narcotics, illegal or unauthorized drugs (including marijuana), simulated drugs, and related drug paraphernalia.

Employees must not report for duty under the influence of any drug/alcohol that may in any way adversely affect their working ability, alertness, coordination, response, or the safety of others on the job.

For purposes of this program, influence shall be presumed for any individual whose drug or alcohol level exceeds applicable testing levels.

All employees who work on the project will provide evidence of a negative drug/alcohol screen no later than the time of safety orientation prior to commencing work and will be required to submit to a post injury drug test. Such tests will be administered at the time the injured worker receives medical treatment.

TI2E will not perform random drug testing; however, lower-tier subcontractors to TI2E may utilize a random testing program.

TI2E and its subcontractors shall not allow employees who are found to be using alcohol or drugs illegally to remain on the project. TI2E and its subcontractors will determine when the employee in violation can return to the project or be permanently removed.

Subcontractors must submit their drug and alcohol programs to TI2E for evaluation, or they will be required to adopt the drug and alcohol program of TI2E. If a subcontractor chooses to adopt

the TI2E program, a notice must be made in writing. TI2E may periodically check with subcontractors to evaluate the compliance of the submitted drug and alcohol program.

Legally prescribed drugs may be permitted on premises or work locations, provided the drugs are in the original prescription container and are prescribed by an authorized medical practitioner for the current use of the person in possession. Legally prescribed drugs must not affect working ability, alertness, coordination, or response of the person taking the medication.

8.4 Site Sanitation Plan

TI2E will provide the necessary portable toilets and washing facilities needed during fieldwork activities. The portable toilets and washing facilities will be located adjacent to the site along the southern perimeter. The SSHO is responsible for completing cleanliness inspections and for ensuring that potable water, toilet paper, and towels are available. The portable toilets will be serviced on a weekly basis. In addition, TI2E will provide workers with disposable sanitary wipes and waterless disinfectants for use throughout each day. The SSHO will assure that adequate break periods are provided in clean areas for personnel to use the toilet facilities and consume food and water. The SSHO will ensure that an adequate supply of drinking water (i.e., at least one quart of water per person per hour) and shade are available at the job site during work periods. Chilled drinking water will be available, and workers will be allowed to eat and drink in the SZ. No ice that is used to cool bottled water is to be consumed. Hand sanitizer will also be provided in the SZ, and the SSHO will ensure that employees wash their hands and face thoroughly before breaks, before lunch, and at the end of the workday.

8.5 Access and Haul Road Plan

No access or haul roads will be constructed during the completion of this project. Access to the SZ will be via existing roadways

8.6 Respiratory Protection Plan

Based upon work experience on similar work sites (projects), exposures to the chemicals of concern at or above their respective permissible exposure limit (PEL) values are highly unlikely at this work site.

The use of a photo-ionization detector (PID) will be used to obtain baseline levels of airborne organic vapor and/or dust levels, as applicable, in the vicinity of the well abandonments and well installations, as well as the worker-breathing zone prior to the start of each workday. This data will be used by the SSHO to help determine if respiratory protection is warranted. Baseline air monitoring will be conducted as described in Section 6, Exposure Monitoring, of the attached SSHP. Experience on other projects with a similar SOW and contaminant of potential concern

(COPC) have demonstrated that the existing concentrations of the COPCs are not acutely hazardous and exposure to personnel will be limited and not approaching PELs.

The primary potential exposure pathways to the COCs are through direct contact with impacted soil, inhalation of vapors from the soil, or inhalation of dust.

8.7 Health Hazard Control Plan

Real-time instrumentation monitoring will be performed during sampling operations to assess:

- The potential hazards to personnel from airborne contaminants;
- The appropriateness of the selected PPE; and
- The potential contaminant migration from each site.

All operations, materials, and equipment will be evaluated to determine the presence of hazardous environments, or if hazardous or toxic agents could be released into the work environment. Refer to Section 9.0, Risk Management Processes, of this APP for a list of the activities covered in the AHAs (SSHP) for a completed activity hazard analysis. The HSPM/CSP and a competent person will evaluate operations, materials, and equipment involving potential exposures to hazardous substances, agents, or environments in order to formulate a hazard control program.

8.8 Hazard Communication Program

The intent of a hazard communication program is to provide employees with awareness of the chemical hazards to which they will encounter during their work, to provide knowledge of the effects of such materials, and to provide the methods to use to protect themselves under both normal working conditions and in emergencies. This OSHA standard was designed for the use of known materials (i.e., those brought to the work site with a known trade name and manufacturer and used by the employees as a material) and does not directly apply to remediation work associated with unknown trade names or manufacturers, or that are waste materials. Workers assigned to this project will have been trained in the Hazard Communication Program, pursuant to the OSHA requirements. The general Hazard Communication requirements include:

- Chemical Inventory
- A Written Hazard Communication Program
- Labels
- MSDS
- Employee Training

Any chemicals brought to the site will also be accompanied by their MSDS and will be documented in the Chemical Inventory List and included as Attachment 4 to this APP. Utilizing the safe work practices and PPE identified in this document, worker exposure to concentrations of hazardous materials are not expected at action levels or above PELs.

8.9 Process Safety Management Plan

By definition, a Process Safety Management Plan is required for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals (i.e., acutely hazardous materials). This project will not involve acutely hazardous materials and/or a potential release of the same, pursuant to the OSHA definition and the SOW; therefore, a Process Safety Management Plan is not applicable for these projects.

8.10 Lead Abatement Plan

Lead is not a COC on this project; therefore, a Lead Abatement Plan is not applicable for this project.

8.11 Asbestos Abatement Plan

Asbestos is not a COC on this project; therefore, an Asbestos Abatement Plan is not applicable for this project.

8.12 Radiation Safety Program

No operations involving radiation hazards, radioactive materials, or radiation generating devices will be involved in the completion of this project; therefore, a Radiation Safety Program is not applicable.

8.13 Abrasive Blasting Plan

Abrasive blasting operations are not part of the SOW at this job site; therefore, an Abrasive Blasting Plan is not applicable.

8.14 Heat/Cold Stress Monitoring Plan

The SSHO will monitor weather forecasts and alert site workers to assist in keeping an eye on the weather. In case of excessive low temperature conditions, workers will be monitored as described in the SSHP (Attachment 1 in Section 3.3, Environmental Hazards).

8.15 Crystalline Silica Monitoring Plan (Assessment)

Although the potential exposure to crystalline silica during removal of remnant asphalt or concrete surface cover at the site is negligible due to the minimal required fragmentation of the slabs, TI2E will complete the following:

1. Implement engineering controls, such as working up wind and dust suppression via watering and misting.
2. Provide disposable particulate respirators with P-95 filters for use during asphalt or concrete demolition and removal.

Exposure to crystalline silica dust is determined to be minimal during well installation because:

1. Silica will only be handled during filter pack installation (sand).
2. The duration of time to handle the sand will be minimal (<20 minutes).
3. The area where work will be performed is a well-ventilated, open area.
4. Engineering controls will be implemented (i.e. relevant personnel working upwind, all others outside of exclusion zone, adding water to suppress dust, etc.).

Exposure to crystalline silica dust is negligible; therefore, a monitoring and respiratory plan for crystalline silica dust is not required.

8.16 Night Operations Lighting Plan

The project does not require any night work; therefore, a Night Operations Lighting Plan is not applicable.

8.17 Fire Prevention Plan

The primary goals of fire prevention and protective measures are to control ignition sources, early detection, and rapid response. The job tasks at this site are not expected to create a fire hazard, but as a precaution, the following preventative measures will be implemented:

- Smoking will be prohibited at the site.
- No welding, open flames, or spark-producing activities will be allowed.
- No flammable and combustible liquids (i.e., gasoline or diesel) will be stored on-site. All equipment used during environmental field activities will arrive on-site with a full, fuel tank.
- All field vehicles and heavy equipment will be equipped with a type-ABC fire extinguisher. Fire extinguishers will be mounted on the vehicles where field personnel can easily access them.

8.18 Wild Land Fire Management Plan

No open flames, burning, welding, or spark producing activities will be conducted during completion of the approved site activities; therefore, a Wild Land Fire Management Plan is not applicable.

8.19 Hazardous Energy Control Plan

Safety guards covering moving or hot parts will be required to be in place during operation of equipment and machinery. Every piece of equipment or machinery used on site will be inspected daily prior to use, and all emergency stop button/controls will be tested. All safety guards and covers will be in place when operating the excavator or transport trucks. Engine controls are located and operated from the operators' control panel.

If maintenance is necessary on machinery, proper lock out/tag out practices will be followed. Electrical hazards may exist from the use of electrical equipment at the site, particularly hand tools. All electrical equipment will be visually inspected for external defects to the equipment, including cords. Should there be any evidence of damage, that equipment shall not be used. All electrical equipment must use a ground fault circuit interrupter system or an assured equipment grounding program as required in 29 CFR 1926.405(j)(1)(iii)(A-D).

8.20 Critical Lift Procedures

The project does not involve critical lifting of equipment using machines; therefore, critical lift procedures are not applicable.

8.21 Contingency Plan for Severe Weather

Site activities will be modified or suspended in the event of adverse or severe weather conditions, such as snow storms, electrical storms, or severe winds. In the case of an electrical storm, all site work will be suspended at the first sight of lightning, and the workers will be moved into vehicles or structures for safety. Work will resume at the instruction of the SSHO, who will consider whether the storm has passed (i.e., clear skies) or whether two hours have passed since the last observed lightning strike.

In the case of high winds, site activities may be suspended as above until safe working conditions have resumed.

8.22 Float Plan

There is no launch or motorboat involved on this project. All activities will be conducted on land, and there are no activities being conducted in a marine environment;therefore, a Float Plan is not applicable.

8.23 Site-Specific Fall Protection Plan

No climbing, working from heights, or exposures to fall hazards are included within the approved SOW; therefore, a fall protection plan is not applicable.

8.24 Demolition Plan

A Demolition Plan is not applicable, because this project does not require any demolition work.

8.25 Excavation/Trenching Plan

No excavation/trenching at depths greater than 5 feet is included in the approved SOW; therefore, an excavation/trenching plan is not applicable.

8.26 Emergency Rescue Plan

No excavation/trenching at depths greater than 5 feet and confined space entry is included in the approved SOW; therefore, an emergency rescue plan is not applicable.

8.27 Underground Construction Fire Prevention and Protection Plan

No underground construction is involved on this project; therefore, this plan is not applicable.

8.28 Compressed Air Plan

This project does not include the use of compressed air; therefore, a compressed air work plan is not applicable.

8.29 Formwork and Shoring Erection and Removal Plan

This project does not include the use of formwork or shoring; therefore, a Formwork and Shoring Erection and Removal Plan is not applicable.

8.30 Precast Concrete Plan

There are no precast concrete members or concrete structures being utilized for this project; therefore, a Precast Concrete Plan is not applicable.

8.31 Jacking Plan (Lift) Slab Plan

Lift-slab operations will not be performed for this project; therefore, Jacking and Slab Plans are not applicable.

8.32 Steel Erection Plan

This project does not require any structural steel assembly. therefore, a Steel Erection Plan is not applicable.

8.33 Site Safety and Health Plan

Refer to Attachment 1 of this APP for the SSHP prepared for this project.

8.34 Blasting Plan

This project does not involve the usage of any explosive materials; therefore, a Blasting Plan is not applicable.

8.35 Diving Plan

This project does not involve diving; therefore, a Diving Plan is not applicable.

8.36 Confined Space

This project does not involve confined space entry; therefore, a Confined Space plan is not applicable. All confined spaces or potential confined spaces shall be identified as encountered by the SSHO at daily tailgate meetings. Any confined spaces identified shall be labeled. If confined space entry becomes required a detailed confined space entry plan shall be developed.

8.37 Exposure Control Plan/Bloodborne Pathogen Prevention Plan

In the event of possible exposure to blood, do not allow unauthorized persons to enter until the spill has been cleaned up. All surfaces must first be cleaned of all visible soil and blood before a disinfectant (1:10 household bleach) is applied. Carefully remove visible blood with disposable towels by putting them over the spill to absorb it (soak with a fresh solution of 1:10 household bleach disinfectant). Use only disposable towels, gloves, and materials to clean up blood because of the difficulties laundering and disinfecting reusable items. If a spill involved broken glassware, never pick up the glass directly with your hands. Always use mechanical means such as tongs or brush and a dustpan. If the blood spill has dried, soak the area, or scrub the area with disposable towels and disinfectant as needed. After cleaning up visible blood and soil, the area should be decontaminated a second time with an appropriate disinfectant used according to the manufacturer's directions. The area can have a final rinse after disinfection, if needed. All clean-up materials, including PPE, should be placed in the disposal bag and double-bagged. Remove gloves inside out, and also place them in the disposal bag. For disposal, contact the PM or SSHO.

9.0 RISK MANAGEMENT PROCESSES

The TI2E Risk Management Process entails a project and task specific analysis of hazards associated with the daily site work and the subsequent controls identified to eliminate these hazards. AHAs have been prepared for daily use by site personnel in order to educate and focus their attention on the goal of achieving zero accidents on every project site. The SSHO will have authority to stop the work of any personnel not following the APP/SSHP and may result in the personnel being required to leave the job site.

TI2E will provide suitable PPE as required for the nature of the job being performed, including but not limited to boots, hard hats, safety eyewear, hearing protection, gloves, protective clothing, face shields, and respirators. This PPE is specified in Section 5 of the SSHP (Attachment 1). Employees will use PPE on any task where there is potential exposure to physical hazards such as equipment operation, objects dropping from above, flying particles, or exposure to toxic or irritating gases, fumes, vapors, liquids, or other materials that may cause respiratory distress or skin irritation. Employees will be trained in the proper use, maintenance, and limitations of PPE.

The specific potential hazards associated with this project and the respective controls are provided as AHAs and are included in Attachment 1 (SSHP).

Work phases that require activity AHAs include the following:

1. Scan, Locate, and Mark Utilities
2. Mobilization and Demobilization
3. Drilling
4. Soil and Groundwater Sampling Activities
5. Equipment Decontamination
6. IDW Removal and Disposal
7. Surveying
8. Test Pit Installation

These tasks are further detailed in the AHA tables (Attachment 1).

10.0 REFERENCES

Chemical Information File, USDOL-OSHA, 1985.

National Institute of Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards, DOHS Pub No. 2005-149.

Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Administration Standards, Title 29 CFR, Parts 1910 and 1926, United States Department of Labor, Occupational Safety and Health Administration.

OSHA Standards, Title 29 CFR, Sections 1910.1001 and 1926.58 (as amended), 1910.134, 1910.20, and 1910.1200.

OSHA, 1989a. Air Contaminants: Permissible Exposure Limits, 29 CFR 1910.1000.54 FR 2332. January 19.

OSHA 1989b. Hazardous Waste Operations and Emergency Response, Final Rule. 29 CFR 1910.120.54 FR 9294, March 6.

NIOSH/OSHA/EPA/USCG, DHH, 1985. Guidance Manual for Hazardous Waste Site Activities, Publication No. 85-115.

U.S. EPA. See United States Environmental Protection Agency Standards.

United States Army Corps of Engineers, 2008. Safety & Health Requirements Manual, EM 385-1-1, September 15.

United States Department of the Navy, 2006. Environmental Restoration Program Manual, August.

ACTIVITY HAZARD ANALYSIS

Table 1. Scan, Locate, and Mark Utilities

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Date Prepared: August 2015	Overall Risk Assessment Code (RAC) (Use highest code) **L**
Project Location: Nike BU 34/35 Control Area and Launch Area Sites, Orchard Park and East Aurora, NY	
Prepared by: Kosala De Silva	
Activity/Work Task: Scan, Locate, and Mark Utilities	
Reviewed by (Name/Title): Mr. Sanjaya Ranasinghe/ HSPM, CSP	
Contract Number: W912DR-13-D-0013	
Involved Personnel: Mr. Bob Janosy / Ben Headington – SSHO Mr. Keith Fields – PM Mr. Sanjaya Ranasinghe – HSPM/CSP	

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Unlikely	Seldom	Occasional	Likely	Frequent
Catastrophic (I)	M	H	H	E	E
Critical (II)	L	M	H	H	E
Marginal (III)	L	L	M	M	H
Negligible (IV)	L	L	L	L	M

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

Task Steps	Potential Hazards	Critical Safety Procedures and Controls	RAC
Park contractor vehicle at site	Vehicle could hit someone or something.	Use spotters when positioning vehicle if needed. Ensure that spotters know how to communicate with driver of vehicle. Wear steel-toed, non-skid boots and safety glasses	**L**
Unload equipment from vehicle.	Lifting of instruments from vehicle could cause strain to worker.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift.	**L**
Move equipment to designated survey location	Handling of instruments could cause strain to worker.	Carry instruments as required by the manufacturer of the instrument. Use straps when provided and adjust for comfort. Use care when walking so that there are no sudden jerks or mis-steps that can cause the worker to strain to maintain control of the	**L**

ACTIVITY HAZARD ANALYSIS

Table 1. Scan, Locate, and Mark Utilities

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

		instrument. Get assistance from other workers if several instruments must be carried. For loads greater than 50 pounds, use two people to carry.	
	Slip, trip, and fall hazards could be present.	Visually inspect work areas and mark, barricade, or eliminate slip, trip and fall hazards. Only work on walking/working surfaces that have the strength and integrity to support employees safely.	**L**
Survey and mark utilities.	Worker could be struck by vehicle.	Wear high-visibility reflective vests at all times in work areas. Make eye contact with operators of vehicles. Post an observer, as needed, when surveyor is using instruments (a surveyor is often focused on the task and may not be aware of nearby traffic). Use traffic controls or barricades, if necessary, to keep traffic away from workers.	**L**
	Worker could be bitten by snakes, insects, etc.	Use buddy system to watch for snakes, insects, etc. Remain clear of snakes or insects if spotted. May wear insect repellent.	**L**
	Use of spray paint to mark underground utilities and anomalies could expose employees to paint fumes or pain itself.	Follow manufacturers' instructions on use of paint. Review MSDSs. Never point spray paint canisters at another person.	**L**
	Mismarking utilities could create unknown hazards.	Use following universal color codes for utilities: Blue – Water; Red – Electrical; Yellow – Gas; Green – Sewer.	**L**
	When carrying stakes, worker could trip and impale body.	Carry stakes in leather or canvas bag that is puncture proof, and carry bag to side of body. Ensure that all tips are pointed toward ground at all times.	**L**
	Installation of wooden stakes presents puncture and splinter hazards.	Keep stake tip pointed at ground. Wear leather gloves. Use caution when using tools to pound stake in.	**L**

ACTIVITY HAZARD ANALYSIS

Table 1. Scan, Locate, and Mark Utilities

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

	Equipment could contact overhead power lines	If work is near an overhead power line, care will be taken to ensure there is clearance when operating equipment.	**L**

Equipment to be Used	**Inspection Requirements**	**Training Requirements**
Hand Tools	Visual prior to use	Tailgate safety meeting
Voltmeter/Multimeter	Instrument Readings	Site-specific orientation Electrical Safety
Personal protection equipment • Level D PPE (steel-toed boots, safety glasses, hard hats, nitrile gloves) • Leather gloves if needed during site set-up, equipment handling • First Aid Kit	Current Certification	First Aid/CPR

ACTIVITY HAZARD ANALYSIS

Table 2. Mobilization and Demobilization

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Date Prepared: August 2015	Overall Risk Assessment Code (RAC) (Use highest code) **L**
Project Location: Nike BU 34/35 Control Area and Launch Area Sites, Orchard Park and East Aurora, NY	
Prepared by: Kosala De Silva	
Activity/Work Task: Mobilization and Demobilization	
Reviewed by (Name/Title): Mr. Sanjaya Ranasinghe/ HSPM, CSP	
Contract Number: W912DR-13-D-0013	
Involved Personnel: Mr. Bob Janosy / Ben Headington – SSHO Mr. Keith Fields – PM Mr. Sanjaya Ranasinghe – HSPM/CSP	

Risk Assessment Code (RAC) Matrix

Severity	Unlikely	Seldom	Occasional	Likely	Frequent
Catastrophic (I)	M	H	H	E	E
Critical (II)	L	M	H	H	E
Marginal (III)	L	L	M	M	H
Negligible (IV)	L	L	L	L	M

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

Task Steps	Potential Hazards	Critical Safety Procedures and Controls	RAC
Mobilization / Site Set-Up	Struck by	All equipment will be properly secured during transport.	L
	Tip Over	Set leveling jacks before using any drilling or heavy equipment	L
	Backing	Use a ground guide along with a functioning back-up alarm during equipment backing	L
	Electrocution/Explosion	Inspect for buried and overhead utilities in the vicinity of drilling locations	L
	Slips, Trips, Falls	Clear trees, roots, weeds, limbs and other ground hazards from the work area	L

ACTIVITY HAZARD ANALYSIS

Table 2. Mobilization and Demobilization

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Demobilization	Physical; Injury from heavy equipment; heavy lifting.	Use Trained equipment operators. Minimize work and personnel in vicinity of equipment	**L**
	Pinch points; slip trip and fall hazards	Institute good housekeeping procedures; keep feet and hands clear of moving/suspended materials and equipment.	**L**

Equipment to be Used	**Inspection Requirements**	**Training Requirements**
Drilling Equipment	Prior to use	• Tailgate safety meeting • Site-specific orientation
Personal protection equipment • Level D PPE (steel-toed boots, safety glasses, hard hats, nitrile gloves) • Leather gloves if needed during site set-up, equipment handling • First Aid Kit	Prior to use	• First Aid/CPR

ACTIVITY HAZARD ANALYSIS

Table 3. Drilling

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Date Prepared: August 2015	Overall Risk Assessment Code (RAC) (Use highest code) **M**
Project Location: Nike BU 34/35 Control Area and Launch Area Sites, Orchard Park and East Aurora, NY	
Prepared by: Kosala De Silva	
Activity/Work Task: Drilling	
Reviewed by (Name/Title): Mr. Sanjaya Ranasinghe/ HSPM, CSP	
Contract Number: W912DR-13-D-0013	
Involved Personnel: Mr. Bob Janosy / Ben Headington – SSHO Mr. Keith Fields – PM Mr. Sanjaya Ranasinghe – HSPM/CSP	

Risk Assessment Code (RAC) Matrix

Severity	Unlikely	Seldom	Occasional	Likely	Frequent
Catastrophic (I)	M	H	H	E	E
Critical (II)	L	M	H	H	E
Marginal (III)	L	L	M	M	H
Negligible (IV)	L	L	L	L	M

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

Task Steps	Potential Hazards	Critical Safety Procedures and Controls	RAC
Park contractor vehicle carrying excavation equipment.	1. Vehicle could hit someone or something. 2. Location could create a traffic hazard.	1. Use spotters when positioning vehicle if needed. Ensure that spotters know how to communicate with driver of vehicle. 2. Locate vehicle in an area that will not obstruct traffic.	**L**
Unload equipment and materials.	1. Load could have shifted during transport or be poorly tied down, causing load to be unstable.	1. If load has shifted or tie-downs are poorly installed, do not stand near truck or load. If necessary, remove each tie-down carefully and position heavy equipment on side where tie-down is being removed to prevent load from falling on that side. 2. Use proper lifting techniques such as keeping the back straight,	**L**

ACTIVITY HAZARD ANALYSIS

Table 3. Drilling

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

	2. Lifting equipment and materials from vehicle could cause strain to worker. 3. Cuts and abrasions could occur while moving equipment and materials. 4. Slip, trip and fall hazards could be present.	lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift. 3. Use leather gloves when moving objects with sharp contact points. 4. Visually inspect work areas and mark, barricade or eliminate slip, trip and fall hazards. Only work on walking/working surfaces that have the strength and integrity to support employees safely.	
Identification of subsurface utilities and equipment operation	1. Chemical Contamination exposure. 2. Struck by equipment, drill mast, rod sections. 3. Improper use and/or damaged drilling equipment 4. Pinch points, positioning of drill head onto probe section 5. Electrocution 6. Exposure to excessive noise levels	1. All personnel assigned to perform drilling operations will operate inside a designated work zone. All PPE will be removed properly prior to exiting the Exclusion Zone (EZ). All equipment and hand tools will be decontaminated in accordance with the established procedures. 2. Be aware of your surroundings and never turn your back to the equipment while in operation. Level D PPE will be worn inside the designated EZ. Any PPE upgrade will be in accordance with SSHP guidelines. 3. Qualified personnel must inspect the drilling equipment prior to operation. Only qualified personnel shall be permitted to operate equipment. 4. Materials shall be inspected for sharp edges prior to being handled, and avoid pinch point hazards. 5. The mast and other equipment must be at least 15 feet from any overhead utility lines. Verify the voltage of any overhead power lines. If any lines are above 50 kV, the clearance distance must be greater. Refer to National Electrical Code for voltages above 50 kV. 6. Hearing protection shall be worn if noise survey results above 85 dBA.	**M**

ACTIVITY HAZARD ANALYSIS

Table 3. Drilling

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Pre-survey area that drilling equipment will drive over	Vehicle could run over unstable ground hazards	Mark all physical hazards. Weight of rig can be significant; verify stability of all routes of travel.	**L**
Perform drilling operations; inspect drill rig	Improper inspection of rig could cause workers to be exposed to hazards associated with operating mechanical devices	• Only qualified personnel shall be permitted to operate equipment. • Ensure that the rig and all associated equipment are inspected by a competent person and that the rig is in safe operating condition. • Inspect equipment; including brakes, tire pressure, cables, and hydraulic and pneumatic hoses, using an inspection form specific for the equipment in use before use and at start of each shift. • Verify that there is a guard cage that can surround the rotating auger when the rig is in use. • Tag and remove from service faulty or unsafe equipment. • Verify that emergency shutdown systems (at least two) are clearly marked, and all site workers know locations. • Verify that shutdown systems work properly when trip wires are pulled or pushed. • Operator's manual must be available and reviewed prior to operation. • Fire extinguishers of the appropriate size will be available on the equipment. • All equipment shall have back up alarms.	**L**
Set up work area and move rig into position	1. Review site layout to avoid potential hazards such as electrocution, damage to underground utilities and/or tipping rig over in unstable soil conditions. 2. Rig could contact overhead lines. 3. Vehicle may move if not properly set up.	1. Do not move drill rig into any work area until site layout plan has been completed and route of travel to any work site has been assessed for hazards (overhead lines and stability of roads and ground). At the pre-activity safety briefing, discuss site layout plan and analysis of route of travel, along with AHAs. Use a spotter for positioning as necessary. Set brake and place wheel chocks under front wheels of mobile rig. Extend stabilizer jacks and ensure sound footing. Vehicle must be level to vertical and horizontal planes. Do	**M**

	4. Rig may not install properly due to the condition of the rig and connecting cables while raising it. 5. When raising rig, rig may not install properly due to the condition of rig and connecting cables. 6. Operators could become pinned between rig and other truck components. 7. High winds could destabilize rig. 8. Traffic in area of drilling could injure workers because vehicles fail to see to worker or workers fail to see the vehicles.	not position wheels (loads) or rig over manholes, vaults, valve boxes, etc. Do not place rig within 15 feet of any overhead electrical lines. 2. Never move the rig when the mast is extended 3. Use spotter to properly position vehicle and set breaks and wheel chocks under front wheels of mobile rig. Always use stabilizer jacks to ensure sound footing. Make sure vehicle is level to the vertical and horizontal planes. 4. Inspect all components to the rig to determine condition and make all necessary repairs prior to raising it. 5. The mast and equipment must be at least 15 feet from any overhead utility lines. Verify the voltage of any overhead power lines and if any lines are above 50 kV, the clearance must be greater (refer to National Electrical Code for voltages above 50 kV). 6. Stand far enough away from any moving parts and never manually guide any moving parts of the rig when it is raised up. 7. Check weather conditions and forecasts to determine if conditions are acceptable for use of rig. Never operate rig if it is raining or winds exceed manufacturer's recommended tolerances. 8. Always wear safety vests and use a flagger, if necessary, to direct traffic away from drilling areas.	
Startup drill and perform drilling	1. Unqualified operators and personnel in area do not have knowledge of drilling hazards. 2. Once started, rig could cause serious injury. 3. Pressurized hydraulic lines could rupture, causing release of hot hydraulic fluid. Hot fluid could ignite if contact is made with an engine. Hot fluid could burn	1. Ensure that only trained personnel use drilling equipment. Have fire extinguisher, spill-control kit, first aid kit, eye wash and an emergency air horn available on site. 2. Never start drilling activities until zone has been cleared. Under no circumstance are workers allowed to approach rotating equipment. 3. Inspect hydraulic lines and replace any damaged hoses or connections before placing rig in use. If rupture occurs, as quickly as possible, berm the liquid to minimize the area over which the liquid spreads. 4. Do not disconnect air hoses and compressors until hose line has been bled. Visually inspect all connections of any lines under	**M**

ACTIVITY HAZARD ANALYSIS

Table 3. Drilling

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

	workers. Fluid could cause environmental contamination. 4. Air hoses or hydraulic hoses under pressure could suddenly release, whip, and hit workers causing severe injury. 5. Strains could result from manually moving materials, equipment and drums. 6. Come into contact with hazards from chemical agents such as gases from the bore hole or refuse material. 7. Overloading of mast could cause potential failure of the mast. 8. Workers could trip or fall by borehole	pressure. To minimize the length of the hose, tie back or attach hoses whenever possible. 5. Use care when handling augers or drill rods and do not lift more than 50 pounds without assistance. 6. Avoid exposure to dust and other chemical that might results from drilling. Determine if PPE is contaminated (based on exposure to contaminants). Place contaminated PPE in a separate, properly labeled, container. Do not place face or head over hole. 7. Masts shall be used in a manner specified by the manufacturer and should be loaded beyond their capacity. 8. Cap and flag open boreholes. Once the site is left unattended, protect and clearly label all open boreholes.	

Equipment to be Used	**Inspection Requirements**	**Training Requirements**
Drilling equipment, Hand Tools, Power Tools, PPE	Prior to use	• Tailgate safety meeting • Site-specific orientation • 40-hour HAZWOPER training and 8-hour HAZWOPER Refresher training (if applicable) • Only trained equipment operators may operate heavy equipment; only Department of Motor Vehicle licensed personnel will operate trucks. All operators and helpers must have documented training on use of equipment.
Personal protection equipment • Level D PPE (steel-toed boots, safety glasses, hard hats, nitrile gloves) • Leather gloves if needed during site set-up, equipment handling • First Aid Kit	Prior to use	• 40-hour HAZWOPER training and 8-hour HAZWOPER Refresher training (if applicable) • First Aid/CPR

ACTIVITY HAZARD ANALYSIS

Table 4. Soil and Groundwater Sampling Activities

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Date Prepared: August 2015	Overall Risk Assessment Code (RAC) (Use highest code) **M**
Project Location: Nike BU 34/35 Control Area and Launch Area Sites, Orchard Park and East Aurora, NY	**Risk Assessment Code (RAC) Matrix**
Prepared by: Kosala De Silva	
Activity/Work Task: Soil and Groundwater Sampling Activities	
Reviewed by (Name/Title): Mr. Sanjaya Ranasinghe/ HSPM, CSP	
Contract Number: W912DR-13-D-0013	
Involved Personnel: Mr. Bob Janosy / Ben Headington – SSHO Mr. Keith Fields – PM Mr. Sanjaya Ranasinghe – HSPM/CSP	

Severity	Probability				
	Unlikely	Seldom	Occasional	Likely	Frequent
Catastrophic (I)	M	H	H	E	E
Critical (II)	L	M	H	H	E
Marginal (III)	L	L	M	M	H
Negligible (IV)	L	L	L	L	M

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

Task Steps	Potential Hazards	Critical Safety Procedures and Controls	RAC
Locate sampling location	Vehicle could hit someone or something.	Use spotters when positioning vehicle if needed. Ensure that spotters know how to communicate with driver of vehicle. Wear steel-toed, non-skid boots and safety glasses	L
Clear area to be sampled or open well cap	Contact with contaminated material	Wear Modified Level D PPE when working with contaminated areas.	L

ACTIVITY HAZARD ANALYSIS

Table 4. Soil and Groundwater Sampling Activities

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Monitor VOCs and combustible gases in the surrounding atmosphere	Exposure to site contaminants or vapors.	Set equipment upwind of site work. Perform air monitoring for VOCs, and combustible gases. If action level is exceeded, evacuate to upwind direction	**L**
Measure depth to water and insert pump or sampling device	Injury from improper use of hand tools	Only trained personnel will use hand tools.	**L**
Cut tubing to length	Cut or skin puncture	Review proper cutting procedures; cut away from your body; use a proper cutting tool; use sharp tools.	**L**
Run electric pumps, generators or other electrical equipment	Electrical shock from energized equipment	Use GFCI plugs and heavy duty extension cords	**L**
Purge Well/Collect groundwater sample, collect soil sample and collect soil vapor sample	Contact with contaminated materials	Wear Modified Level D PPE when working with contaminated soil. Handle samples carefully to avoid spills.	**L**
Remove sampling equipment from area	Muscle strain due to improper lifting	Rotate the task among workers to share the sample collection duties. Follow proper lifting techniques; no manual lifting of heavy loads. Do not over pack coolers greater than 50 pounds. Use two person lifts for heavy objects.	**L**
Close well cap or clear area sampled	Contact with contaminated material	Wear Modified Level D PPE when working with contaminated areas.	**L**
Decontaminate equipment	Chemical exposure	Use non-toxic detergent for decontaminated equipment (Alconox). Minimize need for decontamination by using dedicated and/or disposable equipment. Wear appropriate PPE.	**L**

Equipment to be Used	**Inspection Requirements**	**Training Requirements**
Hand Tools	Visual prior to use	Tailgate safety meeting
Voltmeter/Multimeter	Instrument Readings	• Site-specific orientation Electrical Safety
Personal protection equipment • Level D PPE (steel-toed boots, safety glasses,	Current Certification	• 40-hour HAZWOPER training and 8-hour HAZWOPER Refresher training (if applicable)

ACTIVITY HAZARD ANALYSIS

Table 4. Soil and Groundwater Sampling Activities

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

hard hats, nitrile gloves) • Leather gloves if needed during site set-up, equipment handling • First Aid Kit		• First Aid/CPR

ACTIVITY HAZARD ANALYSIS

Table 5. Equipment Decontamination

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Date Prepared: August 2015

Project Location: Nike BU 34/35 Control Area and Launch Area Sites, Orchard Park and East Aurora, NY

Prepared by: Kosala De Silva

Activity/Work Task: Equipment Decontamination

Reviewed by (Name/Title): Mr. Sanjaya Ranasinghe/ HSPM, CSP

Contract Number: W912DR-13-D-0013

Involved Personnel:
Mr. Bob Janosy / Ben Headington – SSHO
Mr. Keith Fields – PM
Mr. Sanjaya Ranasinghe – HSPM/CSP

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

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Unlikely	Seldom	Occasional	Likely	Frequent
Catastrophic (I)	M	H	H	E	E
Critical (II)	L	M	H	H	E
Marginal (III)	L	L	M	M	H
Negligible (IV)	L	L	L	L	M

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

Task Steps	Potential Hazards	Critical Safety Procedures and Controls	RAC
Decontaminate all reusable materials and equipment.	Lifting of equipment and materials could cause strain to worker.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift.	L
	Worker could be exposed to chemical contaminants.	Avoid spills. Ensure that spill cleanup supplies are available. Wear required PPE and respiratory protection as specified in the SSHP. Visual inspection and ambient air monitoring will determine selection of PPE and respiratory protection. Remove PPE properly and wash hands.	L

ACTIVITY HAZARD ANALYSIS

Table 5. Equipment Decontamination

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

	Decontamination area may become slippery	Visually inspect work areas and mark, barricade, or eliminate slip, trip, and fall hazards as feasible. Maintain proper illumination in all work areas. If decontaminating on plastic sheeting, use caution since plastic sheeting is extremely slippery. Wear boots with good traction.	**L**
	Chemicals to be used are Alconox and Liquinox	Follow instructions on containers and review the MSDS sheets included in Attachment 4.	**L**

Equipment to be Used	**Inspection Requirements**	**Training Requirements**
Drilling Equipment, Hand Tools, Power Tools, PPE	Daily or before use. Use inspection checklist. Complete form and sign. An excavator operators' manual must be available at the job site.	Tailgate Safety Meeting Site-specific orientation OSHA 40-hr (Hazardous Waste Operations) Hazard Observation and Communication
Level D PPE	Current Certification	HAZWOPER

ACTIVITY HAZARD ANALYSIS

Table 6. IDW Removal and Disposal

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Date Prepared: August 2015

Project Location: Nike BU 34/35 Control Area and Launch Area Sites, Orchard Park and East Aurora, NY

Prepared by: Kosala De Silva

Activity/Work Task: IDW Removal and Disposal

Reviewed by (Name/Title): Mr. Sanjaya Ranasinghe/ HSPM, CSP

Contract Number: W912DR-13-D-0013

Involved Personnel:
Mr. Bob Janosy / Ben Headington – SSHO
Mr. Keith Fields – PM
Mr. Sanjaya Ranasinghe – HSPM/CSP

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

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Unlikely	Seldom	Occasional	Likely	Frequent
Catastrophic (I)	M	H	H	E	E
Critical (II)	L	M	H	H	E
Marginal (III)	L	L	M	M	H
Negligible (IV)	L	L	L	L	M

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

Task Steps	Potential Hazards	Critical Safety Procedures and Controls	RAC
Place/pour/pump waste into containers (e.g., 55-gallon drum, 20,000 gallon Baker tank, roll-off bin, etc.).	Lifting of wastes could cause strain to worker.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift.	L
	Worker could be exposed to chemical contaminants.	Wear required PPE. Visual inspection and ambient air monitoring will determine selection of PPE and respiratory protection. Decontaminate exteriors of tools or buckets used to transport wastes to containers. Avoid spills. Inspect all hose fittings/connections for possible leaks	L

ACTIVITY HAZARD ANALYSIS

Table 6. IDW Removal and Disposal

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

		daily. Ensure spill cleanup supplies are available.	
Loading and emptying storage containers/roll off bins	Pedestrians, traffic, limited space	Block off oncoming traffic. Remove obstacles from working area. Be aware of surroundings	**L**
	Overhead hazards (e.g. tree limbs)	Be aware of surroundings.	**L**
	Pinch hand and or fingers	Identify and avoid pinch points. Wear leather work gloves when loading and emptying roll of container.	**L**
	Winch cable could snap	Lower boom slowly so it is level with the container once the container is slightly lifted onto the truck for stabilization.	**L**
	Truck could become unstable	Lower boom slowly	**L**
Load drums onto vehicles	Handling of drums can expose worker to injury (including, but not limited to, strains, lacerations, and pinch points).	Ensure drums are individually properly labeled and that labels are visible when drums are placed on truck. Use truck that has "Tommy Lift" and move drum using drum dolly onto lift. Ensure that drum is secure and will not roll when lift is raised. Wheel drum to appropriate location on truck for transport. Be sure to evenly distribute load weight on bed of truck. Secure drums in place on the truck. If drums are loaded with drum handling device attached to backhoe or excavator, stand away from truck when drum is placed onto truck. Once drum is placed and "loader" moves away from truck, use drum dolly on truck to position drum. Avoid placing pallets of drums on truck unless pallets can be positioned where they will remain for transport. (It is very difficult to move loaded pallets manually).	**L**

ACTIVITY HAZARD ANALYSIS

Table 6. IDW Removal and Disposal

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

	Worker could be struck by vehicles.	Wear high-visibility reflective vests at all times in work areas. Make eye contact with operators of vehicles. Post an observer, as needed, when loading drums close to busy streets. Use traffic controls or barricades, if necessary, to keep traffic away from workers	**L**
Transport drums to temporary storage location.	Drums may leak.	Inspect all drums prior to and following transport. Have spill cleanup supplies and equipment readily available. Surface may become slippery. Wear work boots with good traction soles. Avoid exposure to material. Wear appropriate PPE. Clean up all spills immediately. Notify supervisor.	**L**
	Handling of drums can expose workers to injury (including, but not limited to, strains, lacerations, and pinch points).	If handling drums, use drum dolly, pallet on forklift, or drum grabber attached to backhoe or excavator to more drums into storage. If handling drums, inspect path that drum must be moved over. Ensure that there are no ruts or other obstacles that can cause drum to tip over or be difficult to handle over surface being traversed. Place drums in approved storage area. When manually handling drums, avoid pacing hands between drums.	**L**
	Slip, trip, and fall hazards could be present	Maintain good housekeeping and proper illumination in storage area.	**L**
Store water tanks and drums in temporary storage location pending characterization.	Water storage tanks and drums may leak.	Inspect all containers and hose fittings on a regular basis (weekly for non-hazardous materials, daily for hazardous materials). Have spill cleanup supplies and equipment readily available. Surface may become slippery. Wear work boots with good traction soles. Avoid exposure to material. Wear appropriate PPE. Clean up all spills immediately. Notify supervisor.	**L**

ACTIVITY HAZARD ANALYSIS

Table 6. IDW Removal and Disposal

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Remove cover of containers for sampling.	Lifting storage tank and drum lids may cause injury, particularly to fingers and hands.	Identify and avoid pinch points, such as placing hands between lid and storage tank/drum. Wear leather work gloves when removing and replacing lids	**L**
	Worker could experience strain from use of tools.	Inspect all tools for damage before use. Do not use damaged tools (mark and tag "out of service"). Select hand tools to minimize following stressors: chronic muscle contraction or steady force, extreme or awkward finger/hand/arm positions; repetitive forceful motions; or excessive gripping, pinching or pressing with hands and fingers.	**L**
	Containers could contain atmospheric hazards, thus exposing worker to vapors.	Before fully lifting container covers, place probe above the small opening and measure air just above the opening using a PID or FID. If reading is less than 10 ppm, open cover and proceed with sampling. If reading is greater than 10 ppm, remove cover slowly and stand back to allow cover to ventilate. Measure air just above the drum again after 5 minutes, and if readings are still above 10 ppm, contact the SHSS. Do not place head inside of the drum for any reason.	**L**
Collect sample waste	Worker could be exposed to chemical contaminants.	Wear required PPE. Visual inspection and ambient air monitoring will determine selection of PPE and respiratory protection. Decontaminate exteriors of sample containers. Avoid spills. Ensure spill cleanup supplies are available.	**L**
Replace container covers.	Replacing water storage tank/drum lids may cause injury, particularly to fingers and hands.	Use care when replacing lids. Wear leather gloves when handling lids.	**L**
	Worker could experience strain from use of tools.	Inspect all tools for damage before use. Do not use damaged tools. Mark and tag "out of service". Select hand tools to minimize the following stressors: chronic muscle contraction or steady force; extreme or	**L**

ACTIVITY HAZARD ANALYSIS

Table 6. IDW Removal and Disposal

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

		awkward finger/hand/arm positions; repetitive forceful motions; or excessive gripping, pinching, or pressing with hands and fingers.	
Pack samples for shipment.	Manually moving materials and equipment could cause strains.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck when handling more than one box at a time. Try to pack shipping boxes so that each box does not exceed 50 pounds. For loads greater than 50 pounds, use two people to carry.	**L**
	Contents of sample containers could leak, causing exposure to worker and possibly people handling shipping.	Ensure that each container top is securely tightened. Pack each container in a manner to prevent damage to container during handling of shipping box and during transportation. Ensure boxes meet required packaging standards based on mode of transportation used for shipping.	**L**
Decontaminate all reusable materials and equipment.	Lifting of equipment and materials could cause strain to worker.	Use proper lifting techniques such as keeping back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy items. Use hand truck, if needed. For loads greater than 50 pounds, use two people to lift.	**L**
	Worker could be exposed to chemical contaminants.	Avoid spills. Ensure that spill cleanup supplies are available. Wear required PPE and respiratory protection as specified in the SSHP. Visual inspection and ambient air monitoring will determine selection of PPE and respiratory protection. Remove PPE properly and wash hands.	**L**

Equipment to be Used	**Inspection Requirements**	**Training Requirements**
Hand Tools, Power Tools, PPE	Daily or before use. Use inspection checklist. Complete form and sign. An excavator operators' manual must be available at the job site.	All operators and helpers must have documented training on use of equipment. Tailgate Safety Meeting Site-specific orientation OSHA 40-hr (Hazardous Waste Operations)

ACTIVITY HAZARD ANALYSIS

Table 6. IDW Removal and Disposal

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

		Hazard Observation and Communication
Level D PPE	Current Certification	HAZWOPER

ACTIVITY HAZARD ANALYSIS

Table 7. Surveying

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Date Prepared: August 2015	Overall Risk Assessment Code (RAC) (Use highest code) **L**
Project Location: Nike BU 34/35 Control Area and Launch Area Sites, Orchard Park and East Aurora, NY	
Prepared by: Kosala De Silva	
Activity/Work Task: Surveying	
Reviewed by (Name/Title): Mr. Sanjaya Ranasinghe/ HSPM, CSP	
Contract Number: W912DR-13-D-0013	
Involved Personnel: Mr. Bob Janosy / Ben Headington – SSHO Mr. Keith Fields – PM Mr. Sanjaya Ranasinghe – HSPM/CSP	

Risk Assessment Code (RAC) Matrix

Severity	Probability				
	Unlikely	Seldom	Occasional	Likely	Frequent
Catastrophic (I)	M	H	H	E	E
Critical (II)	L	M	H	H	E
Marginal (III)	L	L	M	M	H
Negligible (IV)	L	L	L	L	M

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

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

Task Steps	Potential Hazards	Critical Safety Procedures and Controls	RAC
Park contractor vehicle at site.	Vehicle could hit someone or something.	Use spotters when positioning vehicle if needed. Ensure that spotters know how to communicate with driver of vehicle.	L
	Location could create a traffic hazard.	Locate vehicle in an area that will not obstruct traffic.	L
Unload equipment from vehicle.	Lifting of instruments from vehicle could cause strain to worker.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and equipment. Use hand truck if needed. For loads greater than 50 pounds, use two people to lift.	L

ACTIVITY HAZARD ANALYSIS

Table 7. Surveying

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Move equipment to designated survey location.	Handling of instruments could cause strain to worker.	Carry instruments as required by the manufacturer of the instrument. Use straps when provided and adjust for comfort. Use care when walking so that there are no sudden jerks or missteps that can cause the worker to strain to maintain control of the instrument. Get assistance from other workers if several instruments must be carried. For loads greater than 50 pounds, use two people to carry.	**L**
	Slip, trip and fall hazards could be present.	Visually inspect work areas and mark, barricade, or eliminate slip, trip, and fall hazards. Only work on walking/working surfaces that have the strength and integrity to support employees safely.	**L**
Survey new locations.	Worker could be struck by vehicle.	Wear high-visibility reflective vests at all times in work areas. Make eye contact with operators of vehicles. Post an observer, as needed, when surveyor is using instruments (a surveyor is often focused on the task and may not be aware of nearby traffic). Use traffic controls or barricades, if necessary, to keep traffic away from workers.	**L**

Equipment to be Used	**Inspection Requirements**	**Training Requirements**
Hand Tools, Power Tools, PPE	Daily or before use. Use inspection checklist. Complete form and sign.	All operators and helpers must have documented training on use of equipment. Tailgate Safety Meeting Site-specific orientation OSHA 40-hr (Hazardous Waste Operations) Hazard Observation and Communication
Level D PPE	Current Certification	HAZWOPER

ACTIVITY HAZARD ANALYSIS

Table 8. Test Pit Excavation

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Date Prepared: November 2015	Overall Risk Assessment Code (RAC) (Use highest code) **L**
Project Location: Nike BU 34/35 Control Area and Launch Area Sites, Orchard Park and East Aurora, NY	**Risk Assessment Code (RAC) Matrix**
Prepared by: Ben Headington	
Activity/Work Task: Test Pit Excavation	
Reviewed by (Name/Title): Mr. Sanjaya Ranasinghe/ HSPM, CSP	
Contract Number: W912DR-13-D-0013	
Involved Personnel: Mr. Kyle Emery / Ben Headington – SSHO Mr. Keith Fields – PM Mr. Sanjaya Ranasinghe – HSPM/CSP	

Severity	Probability				
	Unlikely	**Seldom**	**Occasional**	**Likely**	**Frequent**
Catastrophic (I)	**M**	**H**	**H**	**E**	**E**
Critical (II)	**L**	**M**	**H**	**H**	**E**
Marginal (III)	**L**	**L**	**M**	**M**	**H**
Negligible (IV)	**L**	**L**	**L**	**L**	**M**

Step 1: Review each **"Hazard"** with identified safety **"Controls"** and determine RAC (See above)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible

Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.

RAC Chart

E = Extremely High Risk

H = High Risk

M = Moderate Risk

L = Low Risk

Principal Steps	Potential Safety/Health Hazards	Recommended Controls	RAC
1. Park contractor vehicle at site.	Vehicle could hit someone or something.	Use spotters when positioning vehicle if needed. Ensure that spotters know how to communicate with driver of vehicle. When vehicles or mobile equipment are utilized or allowed adjacent to an excavation, substantial stop logs or barricades shall be installed: the use of a ground guide is recommended	**L**
	Location could create a traffic hazard	Locate vehicle in an area that will not obstruct traffic. Use appropriate traffic signs when necessary in order to alleviate any traffic hazards.	**L**
2. Unload equipment from vehicle	Physical; Injury from heavy equipment; heavy lifting.	Use proper lifting techniques such as keeping the back straight, lifting with legs, limiting twisting, and getting help when moving bulky/heavy materials and	**L**

		equipment. Use hand truck if needed. Lifts greater than 50 lbs, especially repeated lifts, need to be evaluated and approved by a qualified person. Workers shall stand away from vehicles being loaded or unloaded to avoid being struck by spillage or falling materials. Excavating or hoisting equipment shall not be allowed to raise, lower, or swing loads over personnel in the excavation without substantial overhead protection	
3. Test Pit Excavation	Underground/ Overhead Utilities	Identify all utilities around the site before work commences. Cease work immediately if unknown utility markers are uncovered. Use manual excavation within 3 feet of known utilities. Utility clearance shall conform with 29 CFR 1926.955 (high voltage >700 kv) 15 feet phase to ground clearance; 31 feet phase to phase clearance When operations approach the location of underground utilities or any other underground obstructions, excavation shall progress with caution until the exact location of the utility is determined: workers shall be protected from the utility and the utility from damage or displacement	**L**
	Debris	The investigative nature of the excavation requires that extra attention is paid while excavating soils.	
	General safety hazards	When persons will be in or around excavations: the excavation, the adjacent areas, the protective systems shall be inspected daily, as needed throughout work shifts. If evidence of a situation which could result in possible cave-ins, slides, failure of protective systems, hazardous atmospheres, or other hazardous condition is identified, exposed workers shall be removed from the hazard and all work in the excavation stopped until all necessary safety precautions have been implemented. In locations where oxygen deficiency or gaseous conditions are known or suspected, air in the excavation shall be tested prior to the start of each shift or more often if directed by the designated authority: a log of all test results shall be maintained at the work site. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at lower levels are adequately protected from the hazard of falling material or equipment	**L**
	Bodily injury caused by collapsing (unstable) structures	The sides of all excavations in which employees are exposed to danger from moving ground shall be guarded by a support system, sloping or benching of the ground, or other equivalent means. Excavations less than 5 ft in depth and which a competent person examines and determines there to be no potential for cave-in do not require protective systems	**L**

		Except in stable rock, excavations below the level of the base of footing of any foundation or retaining wall shall not be permitted unless: a. A support system, such as underpinning, is provided to ensure the stability of the structure and to protect employees involved in the excavation work or in the vicinity thereof b. A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation and that the excavation will not pose a hazard to employees If the stability of adjoining buildings or walls is endangered by excavations, shoring, bracing, or underpinning designed by a qualified person shall be provided to ensure the stability of the structure and to protect employees. Sidewalks, pavements, and related structures shall not be undermined unless a support system is provided to protect employees and the sidewalk, pavement, or related structure. Where it is necessary to undercut the side of an excavation, overhanging material shall be safely supported	
	Water hazards	Diversion ditches, dikes, or other means shall be used to prevent surface water entering an excavation and to provide good drainage of the area adjacent to the excavation. Employees shall not work in excavations in which there is accumulated water or in which water is accumulating unless the water hazards posed by accumulation in controlled. Freezing, pumping, drainage, and similar control measures shall be planned and directed by a competent engineer: consideration shall be given to the existing moisture balances in surrounding soils and the effects on foundations and structures if it is disturbed When continuous operation of ground water control equipment is necessary, an emergency power source shall be provided: water control equipment and operations shall be monitored by a competent person to ensure proper operation	**L**
	Atmospheric Hazard	Employees shall monitor the breathing zone at all times using a PID, given the investigative nature of the test pits a potential exists to encounter atmospheric hazards. Section 5.2 of the SSHP details action response levels for these efforts, any readings in the breathing zone >10 PPM above background levels requires action.	

	Struck by falling material/equipment	Employees shall be protected (by scaling, ice removal, benching, barricading, rock bolting, wire mesh, or other means) from loose rock or soil which could create a hazard by falling from the excavation wall: special attention shall be given to slopes which may be adversely affected by weather, moisture content, or vibration. Materials, such as boulders or stumps, that may slide or roll into the excavation shall be removed or made safe. Excavated materials shall be placed at least 2 ft from the edge of an excavation or shall be retained by devices which are sufficient to prevent the materials from falling into the excavation: in any case, material shall be placed at a distance to prevent excessive loading on the face of the excavation	**L**
	Struck By/ Against Heavy Equipment	Wear reflective Hi-Vis vests when exposed to vehicular traffic. Isolate equipment swing areas. Make eye contact with operators before approaching equipment. Understand and review hand signals	**L**
	Handling Heavy Objects	Observe proper lifting techniques. Obey sensible lifting limits (60 lb. maximum per person manual lifting). Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads	**L**
	Sharp objects	Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects. Maintain all hand and power tools in a safe condition. Keep guards in place during use.	**L**
	Slips, trips and falls	Clear walkways, work areas of equipment, vegetation, excavated material, tools, and debris. Mark, identify, or barricade other obstructions. Evaluate fall hazards above 4 ft.; use fall protection equipment (harness/lanyard), standard guardrails or other fall protection systems when working on elevated platforms above 6 ft. Use heavy duty industrial (type IA) ladders. Install and inspect scaffolds according to manufacturer's requirements. Only trained operators are permitted to use aerial lifts. Tie-off all straight/extension ladders or manually hold by co-worker at base. Anchor points for fall arrest systems must support at least 5,400 pounds for each worker.	**L**
	High Noise Levels	Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period). Assess noise level with sound level meter if possibility exists that level may exceed 85 dBA TWA	**L**
4. Loading soils for disposal (if required)	Dust hazards	Maintain dust suppression with water spray/mist as needed. Control work area to authorized personnel only. Utilize appropriate PPE. Minimize contact with soils.	**L**

	Cuts/punctures by sharp objects	Wear cut resistant work gloves when the possibility of lacerations or other injury may be caused by sharp edges or objects. Maintain all hand and power tools in a safe condition. Keep guards in place during use.	**L**
	Handling Heavy Objects	Observe proper lifting techniques. Obey sensible lifting limits (60 lb. maximum per person manual lifting). Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads	**L**
	High Noise Levels	Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period). Assess noise level with sound level meter if possibility exists that level may exceed 85 dBA TWA	**L**
	Bodily Injury during skid steer operational activities	Wear reflective safety vest and hard hat. (Safety glasses as needed). A pre-job discussion should occur to ensure both the equipment operator and assisting workers understand the scope of the project. Operator should keep watch for ground workers near equipment and ensure they are aware of operator's intended direction of movement. Use spotter as needed to warn/watch for ground workers. Ground workers should watch operator and equipment, staying clear of equipment's path. All workers need to be aware of changing conditions at work site	**L**
	Falling Off Equipment	Fasten seatbelt or use safety bar properly	**L**
	Rollover	Do not overload bucket. Do not use Skid Steer on uneven ground. Operate within manufacturer listed stability speeds. Keep load balanced	**L**
	Bodily Injury to Operator	Never reach into areas with moving parts such as tracks, hydraulic arms, bucket or armature. Never leave equipment running to clear tracks or troubleshoot problems. Do not operate damaged or malfunctioning equipment. Be aware of changing conditions at work site. Wear hard hat if at risk from being struck from falling materials or other objects	**L**
5. Test Pit Sampling	Struck By/ Against Heavy Equipment	Wear reflective Hi-Vis vests when exposed to vehicular traffic. Isolate equipment swing areas. Make eye contact with operators before approaching equipment. Understand and review hand signals. All equipment shall be stopped and not operational prior to any personnel entry into the test pit.	**L**
	Atmospheric Hazard	Employees shall monitor the breathing zone at all times using a PID, given the investigative nature of the test pits a potential exists to encounter atmospheric hazards. Section 5.2 of the SSHP details action response levels for these efforts, any readings in the breathing zone >10 PPM above background levels requires action.	**L**

	Skin Irritation	Wear nitrile gloves to prevent contact with hands and arms, wear safety glasses or goggles to prevent eye contact from any potential splashes. PPE shall be increased as the situation requires.	**L**
	Slips, Trips, Falls	When entering excavations enter only near stable soil areas to reduce the potential for sidewall cave in and falls. If debris is located in the excavation avoid standing near any unstable materials.	**L**
6. Pit compaction and backfill	Slips, Trips, Falls	Clear walkways, work areas of equipment, tools, construction debris and other materials. Mark, identify, or barricade other obstructions	**L**
	Handling Heavy Objects	Observe proper lifting techniques. Obey sensible lifting limits (60 lb. maximum per person manual lifting). Use mechanical lifting equipment (hand carts, trucks) to move large, awkward loads	**L**
	Struck by/ Against Heavy Equipment, Flying Debris, Protruding Objects	Wear reflective hi-vis vests when exposed to vehicular traffic. Isolate equipment swing areas. Make eye contact with operators before approaching equipment. Barricade or enclose the work area. Restrict work area entry to authorized personnel only during construction activities Wear hard hats, safety glasses with side shields, and steel-toe safety boots. Understand and review hand signals	**L**
	Vibration	Rotate compaction tasks to minimize worker exposure to equipment vibration. Use compactors with vibration dampening devices	**L**
	High Noise Levels	Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period). Assess noise level with sound level meter if possibility exists that level may exceed 85dBA TWA	**L**
	Poor housekeeping	Maintain and review Material Safety Data Sheets (MSDS). Wear appropriate PPE and label secondary containers. Keep chemicals in secured area. KEEP EXTINGUISHERS clear of stored / staged material. Compressed gas cylinders must be stored outside of the building envelope in an upright and secured position with valve stem protecting caps in place. The fuel gases must be separated from oxygen by a distance of 20’ or by a 5’ tall 1 hr rated fire wall. The cylinders shall be protected from accidental contact by mobile equipment.	**L**

Equipment To Be Used	**Inspection Requirements**	**Training Requirements**
Personal protective equipment Hand tools Extension cords & generator Fire extinguishers, first aid kit	Competent Person shall inspect the excavation, the adjacent areas, and protective systems daily: before each work shift; throughout the	Tailgate Safety Meeting Site-specific orientation

ACTIVITY HAZARD ANALYSIS

Table 8. Test Pit Excavation

This Activity Hazard Analysis (AHA) applies to **Nike BU 34/35 Control Area and Launch Area Sites.** The AHA contains potential hazards posed by each major step in this task, lists procedures to control hazards, and presents required safety equipment, inspections, and training.

Backhoe, skid steer, trucks, trailers, Flatbed Truck	work shifts as dictated by the work being done; after every rainstorm; after other events that could increase hazards, e.g., windstorm, earthquake, etc.; when fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom or other similar conditions occur; when there is a change in size, location or placement of the spoil pile; and where there is any indication or change in adjacent structures Daily equipment inspections as per manufacturers Requirements Inspection of all emergency equipment (i.e.: first aid kits, fire extinguishers)	OSHA 40-hr (Hazardous Waste Operations) Hazard Observation and Communication Proper use of equipment Competent Person shall be familiar with EM385.1.1 Section 25 and 29CFR Subpart P (Excavation) Equipment Operators shall be trained and Competent in accordance with OSHA 29CFR Subpart P (Excavation) Subcontractor training certification shall be provided upon request Skidsteer shall be operated by authorized Competent Person. Identification and credentials of Competent Person shall be provided upon request. Review AHA with all site personnel

ATTACHMENTS

ATTACHMENT 1
Site Safety and Health Plan

FINAL
SITE SAFETY AND HEALTH PLAN FOR REMEDIAL INVESTIGATION SERVICES

AT THE FORMER
NIAGARA FALLS-BUFFALO DEFENSE NIKE BATTERY BU-34-35 EAST AURORA AND ORCHARD PARK, NEW YORK

THE FORMERLY USED DEFENSE SITE (FUDS), NO. C02NY007701

CONTRACT NO. W912DR-13-D-0013

Prepared for:

U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Prepared by:

TI2E JV, LLC
3761 Attucks Drive,
Powell, OH 43035

February 2016

FINAL

SITE SAFETY AND HEALTH PLAN

FOR ENVIRONMENTAL REMEDIATION SERVICES

At The Former Niagara Falls-Buffalo Defense Nike Battery Bu-34-35 East Aurora and Orchard Park, New York

The Formerly Used Defense Site (FUDS), No. C02NY007701

Contract No. W912DR-13-D-0013

Prepared by:
TI2E JV, LLC
3761 Attucks Drive,
Powell, OH 43035

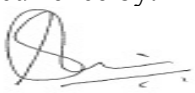
Prepared by:

_____ February 19, 2016

Ben Headington, PMP
Task Manager
Tidewater, Inc.
Office (614) 792-2897; Cell (614) 348-8939

Date

Concurrence by:



_____ February 19, 2016

Sanjaya Ranasinghe, CSP, CHMM
Health and Safety Program Manager / Plan Approver
Tidewater, Inc.
Office (410) 540-8700; Cell (410)-814-8558

Date

Approved by:

_____ February 19, 2016

Keith Fields, PE PMP
Project Manager
Tidewater, Inc.
Office (614) 792-2897; Cell (614) 348-8939

Date

TABLE OF CONTENTS

FIGURES

TABLES

Deleted:

ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
°F	Degrees Fahrenheit
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
CAS	Chemical Abstracts Service
CFR	Code of Federal Regulations
COC	Chemical of Concern
CP	Competent Person
CPR	Cardiopulmonary Resuscitation
CRZ	Contaminant Reduction Zone
CSP	Certified Safety Professional
dBA	Decibels Utilizing the A Filter
EAC	Emergency Action Coordinator
EAP	Emergency Action Plan
ERS	Environmental Remediation Services
EZ	Exclusion Zone
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSPM	Health and Safety Program Manager
IDW	Investigation Derived Waste
IEI	Inspection Experts Inc.
kV	Kilovolt
MSDSs	Material Safety Data Sheets
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PID	Photo-Ionization Detector
PM	Project Manager
POC	Point of Contact
PPE	Personal Protective Equipment
ppm	Parts per Million
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SOW	Scope of Work
SVOCs	Semi-volatile Organic Compound
SZ	Support Zone
TI2E	A joint venture between Tidewater, Inc. and Inspection Experts Inc.
Tidewater	Tidewater, Inc.
TTZ	Target Treatment Zone
TWA	Time weighted average
USEPA	United States Environmental Protection Agency
USACE	United States Army Corps of Engineers
VOC	Volatile Organic Compound
WBGT	Wet Bulb Globe Temperature
WP	Work Plan

1.0 INTRODUCTION

TI2E (an SBA-approved joint venture between Tidewater, Incorporated [Tidewater] and Inspection Experts, Incorporated [IEI]) has prepared this Site Safety and Health Plan (SSHP) for implementation during Environmental Remediation Services (ERS) activities at the Former Niagara Falls-Buffalo Defense Nike Battery BU-34/35 (Nike Site) located in East Aurora and Orchard Park, New York. The field efforts will be performed under the U.S. Army Corps of Engineers New England District (USACE) Contract No. W912DR-13-D-0013.

TI2E will implement this SSHP during field activities. TI2E will perform the scope of work in accordance with the prepared work plan, describing the methods and procedures that will be used during field activities to achieve the project objectives for the tasks identified in this SSHP.

1.1 Purpose and Objective

The purpose of this SSHP is to protect human health and the environment from the risks associated with field activities at Former Niagara Falls-Buffalo Defense Nike Battery BU-34/35 located in East Aurora and Orchard Park, New York. TI2E will perform field activities in accordance with the United States Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities; the National Institute of Occupational Safety and Health (NIOSH) / Occupational Safety and Health Administration (OSHA), October 1985; Title 29, Code of Federal Regulations (CFR), 1926.65, 1910.120, 1910.165, 1910.1030, 1910.1200, 1910.134; the United States Army Corps of Engineers (USACE) Safety and Health Requirements Manual, EM-385-1-1, (2008); and any other relevant Federal, State, and local regulations.

The SSHP objectives are to insure that all necessary precautions for fieldwork are in place, and that appropriate health and safety procedures are followed at all times to protect personnel. In addition, the SSHP objectives include the necessary protection to prevent damage, injury, or loss of property and equipment, and to respond quickly and effectively to TI2E-related activities. The Site Safety and Health Officer (SSHO) will maintain a copy of the signed, final version of this SSHP and the Accident Prevention Plan (APP) on-site at all times when work is being performed.

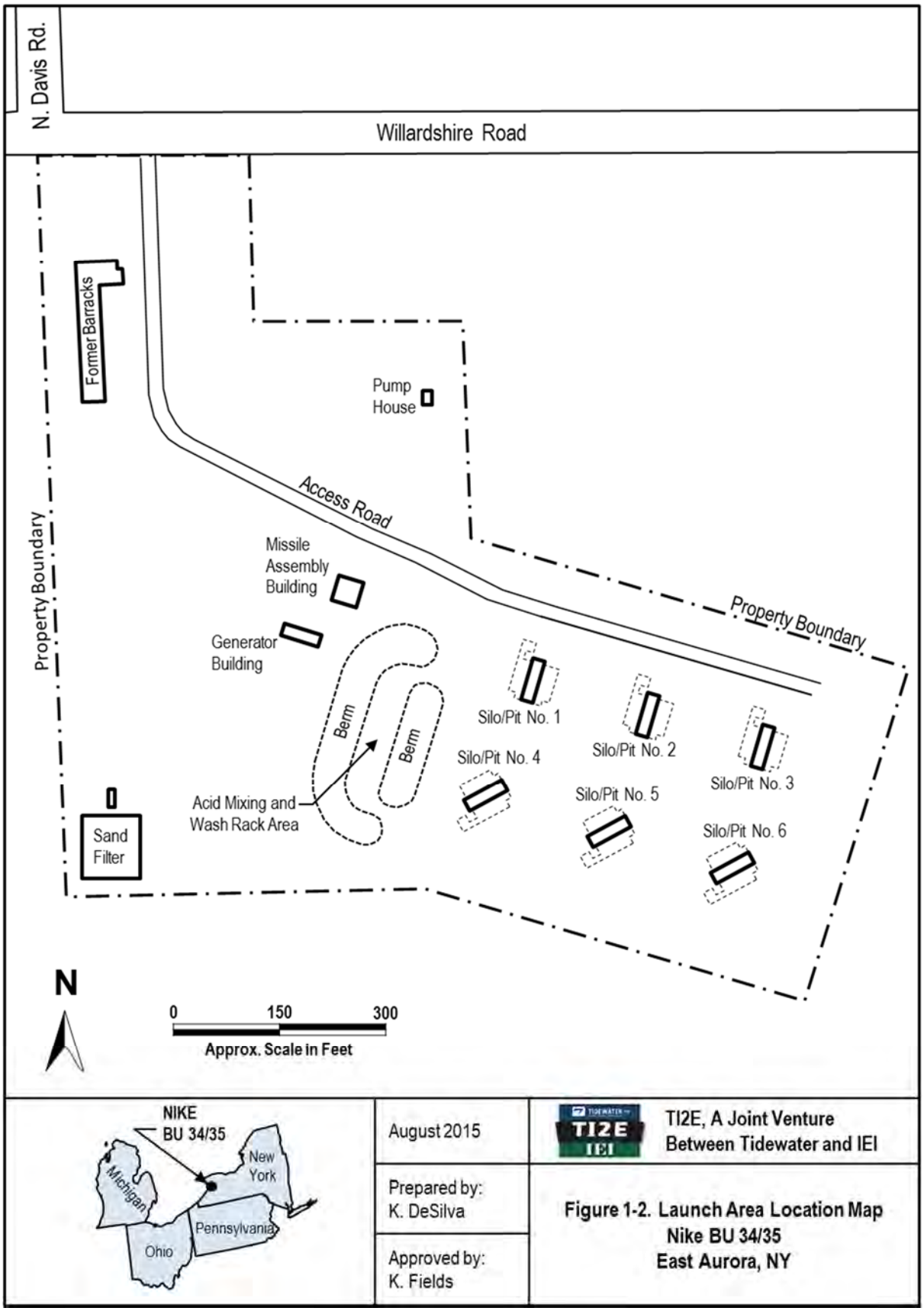
All TI2E employees involved in intrusive field work at the site have completed the required 40-hour initial Hazardous Waste Operations and Emergency Response (HAZWOPER) training, maintain qualification through annual refresher training, are under a program of medical monitoring supervised by a physician, and are certified to wear respiratory protection, as specified in 29 CFR Part 1910.134. Field work that does not pose a risk of coming into contact with potential onsite contamination do not require OSHA 40-hour HAZWOPER training, examples of these activities include: delivery driver, surveyor, utility location, etc.

TI2E recognizes that conditions on a site may change, or that more information may become available, during the operation. If, during the operation, it is determined that the conditions are not as described, or the protection specified in the APP/SSHP requires modifications, the Site Safety and Health Officer (SSHO) will stop work and contact the Health and Safety Program Manager (HSPM)/Certified Safety Professional (CSP) and the Project Manager (PM) for guidance. Work will not resume until authorized by the PM.

1.2 Site Description

The Niagara Falls-Buffalo Defense Nike Battery BU-34/35 is located in Erie County, New York and consists of two operational areas located on separate parcels of land. These include the battery control area (Control Area) (also called Integrated Fire Control), and the launch area (Launch Area) with underground missile magazines (also called silos in previous reports), launchers, and adjacent assembly, missile fueling, and service areas. The Control Area is a 25.65-acre parcel of land located at 3270 Transit Road in Orchard Park, New York. The Launch Area is a 19.84-acre parcel of land located at 601 Willardshire Road near the intersection of North Davis Road in the Town of Aurora, New York. The Control Area and Launch Area location maps are shown in Figures 1-1 and 1-2, respectively. A detailed summary of the site history and previous investigations at each site are provided in the Remedial Investigation (RI) Work Plan for the Niagara Falls-Buffalo Defense Nike Battery BU-34/35.

August 2015	TI2E, A Joint Venture Between Tidewater and IEI
Prepared by: K. DeSilva	**Figure 1-1. Control Area Location Map Nike BU 34/35 East Aurora, NY**
Approved by: K. Fields	


N. Davis Rd.
Willardshire Road
Former Barracks
Pump House
Access Road
Property Boundary
Property Boundary
Missile Assembly Building
Generator Building
Berm
Berm
Acid Mixing and Wash Rack Area
Sand Filter
Silo/Pit No. 1
Silo/Pit No. 2
Silo/Pit No. 3
Silo/Pit No. 4
Silo/Pit No. 5
Silo/Pit No. 6
N
0
150
300
Approx. Scale in Feet
NIKE BU 34/35
New York
Michigan
Pennsylvania
Ohio
August 2015
TI2E, A Joint Venture Between Tidewater and IEI
Prepared by: K. DeSilva
Approved by: K. Fields
Figure 1-2. Launch Area Location Map
Nike BU 34/35
East Aurora, NY

1.3 Scope of Work

The scope of work (SOW) for field activities at the Former Niagara Falls-Buffalo Defense Nike Battery BU-34/35 will be implemented in accordance with the Remedial Investigation Work Plan. Following the collection of historical information on the site, the following activities will be carried out at the Launch Area:

- Locate and evaluate condition of existing monitoring wells, sand filter, pump house assembly, and silo pits
- Perform Utility Location
- Install at least 3 new borings/monitoring wells (additional if warranted by site conditions)
- Evaluate soil and groundwater chemical composition at existing and new soil borings/monitoring wells
- Install 3 test pits
- Conduct silo/pit investigation including collection of water samples from each silo/pit
- Conduct Site Survey

1.4 Site Activities Requiring an Activity Hazard Analysis

Work phases that require an activity hazard analysis (AHA) include the following:

1. Scan, Locate and Mark Utilities
2. Mobilization and Demobilization
3. Drilling (Well Installation and Abandonment)
4. Soil and Groundwater Sampling Activities
5. Equipment Decontamination
6. Investigation Derived Waste (IDW) Removal and Disposal
7. Surveying
8. Test Pit Installation

2.0 KEY PERSONNEL AND RESPONSIBILITIES

Key personnel for this project include the TI2E PM, Mr. Keith Fields; the SSHO Mr. Bob Janosy PG; and the alternate SSHO, Mr. Ben Headington PMP; the HSPM, Mr. Sanjaya Ranasinghe, CSP; and subcontractor personnel. An alternate SSHO with the required OSHA Safety Training will be available at all times, and will be assigned when the SSHO is not on-site. All project field staff, including subcontractor personnel, have completed comprehensive health and safety training, which meets the requirements of Title 29 Code of Federal Regulations Parts 1926.65, 1910.120. In addition, all workers assigned to this project will comply with the health and safety requirements associated with this project.

Specific project safety responsibilities for these key personnel are provided in detail in Section 3.0 of the APP, and are briefly outlined below. TI2E developed this SSHP for TI2E personnel. Subcontractor personnel will, at a minimum, follow this SSHP or a plan approved by USACE and TI2E.

2.1 Project Manager Responsibilities

The PM for this project will be Mr. Keith Fields, Professional Engineer (PE), Project Management Professional (PMP), who has completed the 40-hour HAZWOPER class, and completes annual 8-hour HAZWOPER refresher classes. As the PM, Mr. Fields is responsible for generating, organizing, and compiling the SSHP, which describes planned field activities and potential hazards that may be encountered at the site. The PM will be responsible for establishing emergency communications with all potential emergency response organizations and verifying all emergency telephone numbers prior to the start of on-site work. The PM is also responsible for ensuring that adequate training and site safety briefings (including provisions for specific pieces of equipment) are provided to the project field team. The PM will provide a copy of this SSHP to the project field team, and a copy to each subcontractor prior to field activities. A copy of this SSHP shall be on-site at all times. Associated health and safety responsibilities will include:

- Coordinating the activities of all contractors' field personnel, including their signed acknowledgment of the SSHP;
- Selecting a SSHO and field personnel for the contractual site work to be undertaken;
- Ensuring that the tasks assigned to the contractor are being completed as planned and are kept on schedule;
- Providing authority and resources to ensure that the SSHO is able to implement and manage safety procedures;
- Preparing reports and recommendations about the project to the client and the concerned contractor's personnel;
- Ensuring that the SSHO is aware of all of the provisions of this SSHP and instructing all personnel on site safety practices and emergency procedures defined in this plan

- Ensuring that the SSHO is monitoring site safety;
- Directing changes in work practices to improve worker health and safety, if necessary;
- Removing individuals from the site if their conduct jeopardizes the health and safety of themselves and/or others;
- Suspending work on any project or operation that jeopardizes the safety of anyone in the area; and
- Suspending work on a project or activity if the health and safety plan and/or protocols used are (or are suspected to be) inappropriate or inadequate.

2.2 Health and Safety Program Manager/CSP Responsibilities

The HSPM/CSP for this project is Mr. Sanjaya Ranasinghe. The HSPM/CSP is responsible for developing and coordinating the health and safety program. The HSPM/CSP will also be responsible for reviewing and approving the SSHP for accuracy and incorporating new information or guidelines that aid the PM and SSHO in further definition and control of the potential health and safety hazards associated with this project. Along with the PM and the SSHO, the HSPM/CSP also can suspend or modify work practices for safety reasons and dismiss individuals whose on-site conduct endangers the health and safety of themselves and/or others.

2.3 Site Safety and Health Officer Responsibilities

The SSHO for this project is Mr. Bob Janosy PG, and the alternate SSHO is Mr. Ben Headington PMP. The SSHO has a direct line of authority from TI2E's HSPM/CSP to implement specific health and safety requirements for specific site activities, and for ensuring that all team members, including subcontractor(s), comply with the APP/SSHP. It is the SSHO's responsibility to inform the subcontractor(s) and other field personnel of chemical and physical hazards, as they become aware of them. The SSHO and alternate SSHO are the competent persons overseeing site activities during this field investigation. No project activities will be conducted unless the SSHO/Competent Person is on site supervising. Additional SSHO responsibilities include:

- Ensuring that all project-related personnel have signed the personnel agreement and acknowledgments contained in this SSHP (Refer to Attachment 2 of the APP);
- Providing a daily site safety briefing (tailgate meeting) for team members;
- Evaluating weather conditions and chemical hazard information to make recommendations to the PM about any modification to work plans or personal protective equipment (PPE) requirements to maintain personnel safety;
- Monitoring the compliance activities and the documentation processes;
- Approving all field personnel working on site while taking into consideration their level of training, physical capacity, and their ability to wear PPE necessary for the assigned tasks;
- Inspecting all PPE prior to use;

- Inspecting all equipment prior to use, which includes observing the testing of all "emergency" stop switches and ensuring that the required number of emergency stop switches are available;
- Assisting the PM in SSHP documentation compliance by completing standard forms (Refer to Attachment 2 of the APP);
- Monitoring the compliance of field personnel for the routine and proper use of PPE that is required for each task;
- Assisting in, and evaluating the effectiveness of, decontamination procedures for personnel, protective equipment, sampling equipment, heavy equipment and vehicles;
- Enforcing the "buddy system" as appropriate for site activities;
- Reviewing with site personnel the emergency phone numbers, the location and route to the nearest medical facility, the procedures for arranging emergency transportation to the nearest medical facility, and posting the related information (i.e., the telephone numbers of the local hospital, police and fire along with the route to the hospital);
- Stopping operations that threaten the health and safety of the field team or the surrounding population;
- Entering the exclusion area in emergencies after notifying emergency services and taking appropriate precautions;
- Observing field team members for signs of exposure, stress, or other conditions related to pre-existing physical conditions and/or site work activities;
- Serving as the Emergency Action Coordinator (EAC);
- Directing changes in work practices to improve health and safety;
- Removing individuals from operations if their conduct jeopardizes the health and safety of themselves and/or others; and
- Suspending work on a project or activity if the health and safety plan and/or protocols used appear, or are suspected to be, inappropriate or inadequate.

2.4 Project Field Staff

The project field staff is responsible for ensuring that activities are performed in accordance with the APP/SSHP/AHAs, and that deviations from the plan are based upon field conditions encountered, have been approved by the PM and/or SSHO, and that the information is well documented in field notes. Field staffs' health and safety responsibilities include:

- Following the APP/SSHP/AHAs;
- Following the Corporate Health and Safety Program;
- Reporting to the SSHO any unsafe conditions or practices;
- Reporting to the SSHO all facts pertaining to incidents that result in injury or exposure to toxic materials or chemicals of concern (COCs);
- Reporting equipment malfunctions or deficiencies to the SSHO;

- Reviewing the APP/SSHP in the field, as necessary;
- Attending the daily pre-work safety tailgate meetings;
- Attending the scheduled health and safety training classes; and
- Attending all scheduled medical examinations.

It is the responsibility of individual organizations involved in the field activities to ensure understanding of, and compliance to, the SSHP by its on-site employees or representatives working in controlled areas. Failure by any person to adhere to this plan may result in removal from site activities.

2.5 Subcontractor Responsibilities

All subcontractors are responsible for their own health and safety program and the health and safety of their own employees. This requirement is based on OSHA regulations, which recognize the employer-to-employee responsibility for health and safety. Each subcontractor will submit a properly completed AHA to the TI2E SSHO for review prior to commencing fieldwork for each task they will perform under this scope of work.

As stated above, subcontractors are responsible for instituting health and safety training for their employees. At a minimum, each must comply with the TI2E APP/SSHP. TI2E will provide copies to the subcontractor's employees when requested, and they will be required to sign the Site Safety Tailgate Meeting Form as part of the TI2E safety protocol prior to working on site.

2.6 Policies and Procedures Regarding Noncompliance with Safety Requirements

Whenever a violation of safety policy occurs and requires correction, the SSHO will document the situation and request the subcontractor's competent person to initiate corrective action. Corrective action will be documented with further explanation given in the daily project notes. If immediate corrective action is not taken by the subcontractor, they will be notified in writing using the Safety/Health Violation Notice. The SSHO and PM will be informed of the action taken within 24 hours of the violation. The involvement of the PM is essential to ensuring that there are no additional violations of safety policies at the work site. TI2E reserves the right to immediately remove any personnel from the site for a serious violation of safety requirements.

2.6.1 Subcontractors First Violation of a Rule or Regulation

A subcontractor employee who is cited for a first-time notice of a Safety/Health Violation Notice shall be immediately removed from the site, and shall not be permitted to return to work for a period of at least 24 hours, missing the next full workday. For example, if an employee was cited on a Friday afternoon, they would leave the site that day and would not be permitted to return to work until Tuesday morning.

2.6.2 Subcontractors Second Violation of a Rule or Regulation

A subcontractor employee responsible for a repeat offense or receiving a second Safety/Health Violation Notice shall be immediately and permanently removed from the site for the remainder of the contract period. This requirement may only be waived if the subcontractor demonstrates, on behalf of the employee, extenuating or mitigating circumstances, and obtains a waiver from the TI2E SSHO and/or PM.

2.7 Safety Accountability for Managers and Supervisors

The following has been adopted into TI2E's Policies and Procedures Manuals:

"First line supervisors and management, site managers, department managers, and safety representatives are responsible for enforcing all safety and health policies. TI2E will take disciplinary action against employee-owners for failing to enforce such policies." TI2E will follow the violation procedures discussed for subcontractors with their own employees.

Also, the following statement was adopted into the policy: "TI2E reserves the right to dismiss employee-owners who commit serious or repeat safety or health violations."

3.0 HAZARD/RISK ANALYSIS

This section discusses chemical, physical and environmental hazards that workers may encounter. Section 3.1 identifies COCs anticipated to be present at the site. Section 3.2 discusses physical hazards identified with this site including those associated with the use of heavy equipment. Environmental hazards discussed in Section 3.3 are associated with the physical location of the site, weather conditions (such as heat stress and noise), and contact with flora and fauna.

Daily "Tailgate" safety meetings will be held at the start of each workday; potential chemical, physical, and environmental hazards and preventative safety measures will be discussed. Subsequent Tailgate safety meetings may be called when the SSHO, HSPM, or PM believes that a potential safety issue that was not covered in the morning meeting may exist. An AHA has been developed for each task associated with the general contract activities and is included in this SSHP. This analysis identifies the sequence of work, specific hazards anticipated, and the control measures to be implemented to minimize or eliminate each hazard. The AHAs will be used to augment daily safety meetings intended to heighten safety and hazard awareness on the job.

3.1 Chemical Hazards

The anticipated COCs for the Nike BU-34/35 Control Area and Launch Area are VOCs, SVOCs, metals, PCBs (Aroclor 1254), and Petroleum Hydrcarbons (Diesel Range Organics [DROs] and Gasoline Range Organics [GROs]). The Material Safety Data Sheets (MSDSs) for COCs and other chemicals that may be used during the ERS will be presented in Attachment 4 of the APP. The MSDSs will be provided in a combined project site list and made accessible in a centralized location for both TI2E and subcontractor personnel to use.

Exposure to a listed COC on site is possible, but anticipated to be improbable due to the nature of work. Site workers will use Level D PPE protection while working on site, including hard hats, coveralls/standard work clothing, safety glasses with protective side shields, safety-toed work boots and chemical-resistant (nitrile) gloves and/or leather work gloves. TI2E will acquire, and review with all personnel during daily safety meetings, all MSDSs for any additional chemicals brought onto the site.

3.2 Physical Hazards

There are numerous physical hazards associated with this project, which, if not identified and addressed, could cause accidents and personal injury to field personnel, as well as operational problems. Field personnel should maintain awareness of potential safety hazards, and should immediately inform the SSHO of any new hazards, so that corrective measures can be taken. In the event of a medical emergency, the nearest medical facilities (with directions) are outlined in

Section 8. For specific physical hazards associated with drilling activities and IDW handling, refer to respective AHAs.

3.2.1 Slips, Trips and Falls

During field activities, work may occur in areas where uneven surfaces or job supplies and other equipment at ground level present possible slip, trip and fall hazards. Wet weather conditions and areas where heavy equipment has traveled over may exacerbate such hazards. Work locations will be kept as tidy as possible and free of ground debris. Personnel will wear appropriate footwear for site conditions and walk carefully.

3.2.2 Head and Back Injuries

As minimum requirements, hard hats and safety glasses will be donned prior to performing any site activities. This will prevent minor head injuries caused while working around equipment, with hand tools, or process related structures. At the daily safety meeting, personnel will be educated in proper lifting techniques and will not lift heavy items without assistance.

3.2.3 Overhead Power Lines and Underground Utilities

All field vehicles and equipment will be maintained a minimum distance of 20 feet, in vertical and horizontal directions, from all overhead electrical power lines (energized lines) and/or electrical equipment with a voltage less than or equal to 50 kilovolts (kV). If the voltage exceeds 50 kV, the clearance will be increased by at least 4 inches for every 10 kV over that voltage. While not likely, various forms of overhead and underground utility lines or pipes may be encountered during field activities. Prior to the start of borehole advancement and well installation, authorization from all concerned public and base utility department offices will be received. Should any site activities cause equipment to come in contact with utility lines, the SSHO and HSPM will be notified immediately. Work will be suspended until the appropriate actions for the given situation can be implemented.

3.2.4 Heavy Equipment

The use of heavy equipment presents the greatest potential for injury to personnel. The moving parts of heavy equipment may create pinch points, which can cause serious injury or death. Each piece of heavy equipment (i.e. sonic drilling rig) shall have emergency shut-off switches, and all shut-off switches must be operable and tested at the beginning of each work day the equipment is operated. No unrestrained hair longer than shoulder length will be allowed on site workers. A tight fitting bandanna or hair net below the hard hat will be required to restrict hair longer than shoulder length. In all cases, rotating shafts or gears should be guarded to prevent accidental contact. Loose clothing and/or jewelry will also be prohibited around heavy equipment. Clothing hanging away from the body must be restricted and if this is not possible, the worker will have to change clothes. Jewelry around the neck, hands, forearms and waist will be removed prior to

working around the excavation area. Mobile equipment operators will have had the required training and will have demonstrated the necessary skills to operate the heavy equipment.

Another hazard associated with heavy machinery is the lack of visual contact between the operator and ground personnel when mobilizing, or possibly positioning the equipment. Personnel approaching heavy equipment while operating will observe the following protocols:

- Make eye contact with the operator (and spotter);
- Wear a brightly colored vest or shirt;
- Signal the operator/driver to cease heavy equipment activity/movement; and
- Approach the equipment and inform the operator of intentions.

All personnel working on site will wear Level D PPE, which includes a hard hat, safety glasses, coveralls/standard work clothing, steel-toed boots, chemical-resistant gloves, and a brightly colored shirt/vest. In addition to the standard clothing, disposable earplugs will be available for utilization by all on-site workers. Mobile equipment will be equipped with occupant restraints and/or rollover protection according to 29 CFR 1926, Subpart O. All heavy equipment and trucks (except for pick-up trucks) will have back-up alarms.

A communication program including the use of hand signals, 2-way radios, and/or cellular phones among workers shall be implemented during the project. Workers on the ground are to use the "buddy system" at all times and be cognizant of the reduction of communication abilities in high noise areas. The specific hand signals to be used during the project shall be discussed in the tailgate safety meeting. Hand signals that will be used by site personnel in emergency situations or when verbal communication is difficult will include the following.

Table 3-1: Hand signals to be used in emergency situations

Signal	Definition
Hands clutching throat	Out of air or cannot breath
Hands on top of head	Need assistance
Thumbs up	Okay, I am all right, or I understand
Thumbs down	No or negative
Arms waving upright	Send backup support
Fist clenched tight	Exit area immediately
Index and thumb rubbing together	Stop Slowly

In case of an emergency, an air horn shall be used by the SSHO to alert site personnel. The following signals will be used.

Table 3-2: Air horn signals to be used in emergency situations	
Signal	**Definition**
One Short Blast	Warning or Attention, Stand By for Directions
One Extended Blast	Evacuation
Repetitive Short Blasts	Fire
One Short and One Long Blast	All Clear
Short and Long Blasts Repeatedly	Medical Emergency

Any sounding of this device shall be cause to stop work and prepare to mobilize to the predetermined emergency meeting area (i.e., the Support Zone unless changed by the SSHO and announced during the morning Safety/Tailgate Meeting) for further direction or information. Personnel will remain in the emergency meeting area until the SSHO or his authorized representative provides further instructions. A roll call will be conducted to confirm that all workers are mobilized in the meeting area.

3.2.5 Electrical Hazards

The SSHO will inspect all equipment daily prior to its use to confirm that it is functioning as designed. The SSHO will remove from service any equipment which is found to be malfunctioning. The equipment will be replaced in lieu of on-site repair. If applicable, all equipment will be properly grounded prior to and during all work activities performed on-site.

All electrical wiring on the heavy equipment shall be covered by the appropriately colored wire insulation. Junction boxes and connections will be sealed to protect from potential bad weather issues.

3.2.6 Fire and Explosion Hazards

It is unlikely that explosive atmospheres will be encountered during the proposed remedial activities; however, knowledge of fire/explosion prevention is required.

The following standard safety procedures will be implemented:

- All field vehicles and heavy equipment will be equipped with a type-ABC fire extinguisher. Fire extinguishers will be mounted on the vehicles where field personnel can easily access them. A fire extinguisher check, including inspecting gauges, hoses, and tanks, must be done monthly to ensure proper operation of the equipment.
- When necessary, other fire-fighting equipment should be made available.
- Open fires and burning are prohibited. Smoking will be prohibited in all areas where flammable, combustible, or oxidizing materials are stored or are in use.
- No flammable and combustible liquids (i.e., gasoline or diesel) will be stored on-site. All equipment used during the excavation activities will arrive on-site with a full fuel tank.
- Vehicle engines will be shut off when not in use.

- Smoking is prohibited.

3.3 Environmental Hazards

Environmental hazards associated with the site will be discussed at the orientation meeting prior to the start of field activities. Personnel will be apprised of symptoms of exposure to certain biological hazards and heat stress. If site workers are required to wear semi-permeable or impermeable protective clothing, physiological monitoring for signs of heat stress injury will commence when ambient temperatures reach 75 degrees Fahrenheit (°F). Pursuant to the Cal-OSHA Heat Illness Prevention standard, 8CCR 3395, there shall be at least one quart of water per person per hour and shade available throughout the workday. Employees may stop work whenever they believe it is necessary to prevent heat stress and have water and/or sit in the shade for at least 5 minutes. The SSHO is responsible for monitoring the weather on hot workdays (i.e., over 75°F when disposable suits are being worn) in order to adequately monitor the work force.

3.3.1 Heat Stress

TI2E field workers may spend some part of their day in a hot, humid environment. The amount of heat stress a worker faces in a hot work area may be affected by four environmental factors: temperature, radiant heat, humidity, and air velocity. Personal characteristics such as age, weight, fitness, medical condition, and acclimatization to the heat also affect the level of stress. The human body has defenses to reduce the effects of heat on the body. However, under certain situations, these body functions are not substantial enough to eliminate the problem. When this occurs, the body may be subject to heat stress. Physical reactions to heat stress will range from mild reaction such as fatigue, irritability, anxiety, and decreased concentration, to death.

Heat stress occurs in four stages. These are listed below in order from least to most severe:

1. Heat Rash: Heat rash is caused by continuous exposure to hot, humid air and is aggravated by chafing clothes. This condition decreases the ability to tolerate heat. The symptom is a mild red rash.
2. Heat Cramps: Heat cramps are caused by loss of body fluid through perspiration that is not balanced by adequate fluid intake. Heat cramps typically are the first sign of heat stress, and can lead to heat stroke. Symptoms include acute, painful spasms of voluntary muscles, particularly in the abdomen and the extremities. These may also occur during rest.
3. Heat Exhaustion: Heat exhaustion is a weakness caused by loss of fluids. This is the next sign that may lead to heat stroke. Symptoms are pale, moist, clammy skin; perfuse perspiration; and extreme weakness. Body temperature is normal, pulse is weak and rapid, and breathing is shallow. These symptoms may be accompanied by headache, vomiting and dizziness.

4. Heat Stroke: Heat stroke is the most serious and dangerous reaction to heat stress and is caused by a failure of the body's natural heat regulating mechanisms. Symptoms are red, hot, dry skin, nausea, dizziness, confusion, extremely high body temperature, rapid breathing and pulse rate, and unconsciousness.

To minimize heat stress, employees shall observe the following work practices and control measures in hot work areas:

- Alternate work and rest periods with rest periods in a cooler area;
- Reduce work load under extreme heat conditions;
- Drink large amounts of water;
- Ensure adequate ventilation and air movement around the worksite; and
- If excessive heat persists in the work area and control measures do not adequately reduce the heat stress on the employees, work will be terminated until the condition subsides.

3.3.2 Cold Exposure

During winter months employees may need to work in cold environments. Working outdoors at low temperatures may subject employees to cold stress. Exposure to extreme cold for a short period of time causes severe injury to the surface of the body. Prolonged exposure may result in a generalized cooling of the body and eventually in death.

Two factors influence the development of cold injuries: ambient temperature and wind velocity. Wind chill is used to quantify the chilling effect of wind in combination with the temperature. Moisture, from environmental conditions or perspiration, increases the cooling rate of the body and may decrease the insulating effectiveness of clothing.

Frostbite is the result of exposure of the skin to excessive cold conditions. It is characterized by a grayish or whitish appearance of the skin. Frostbite also causes a deadening of the nerve endings in the exposed areas. For example, a frostbitten hand will no longer feel cold to the victim. As a result, frostbite may go unrecognized for a period of time, which can cause more injury. To prevent frostbite, workers should stop work and warm cold skin at the onset of numbness.

Hypothermia is a general cooling of the body caused by freezing or rapidly dropping temperatures.

Symptoms occur in five stages:

1. Shivering
2. Apathy, listlessness, sleepiness and cooling of the body to less than 95 degrees F
3. Unconsciousness, glassy stare, slow pulse and slow respiratory rate

4. Freezing of the extremities
5. Death

To maintain adequate protection against cold exposure, employees shall observe the following work practices and control measures:

- Alternate work and rest periods with rest periods in a warmer area;
- Utilize a supplemental heat source, if possible;
- Wear an insulating liner or hood under the hard hat;
- Dress warmly by layering clothing;
- Avoid becoming overheated by removing layers of clothing while working to remain cool enough to not perspire;
- Utilize clothing materials that do not lose insulating value when wet or dirty (i.e. use wool or polypropylene; avoid down or cotton); and
- Keep clothing clean.

If excessive cold persists in the work area and control measures cannot reduce the cold stress on employees, work will be terminated until the condition subsides

3.3.3 Noise

Noise is a potential hazard in areas where heavy equipment, power tools, pumps, compressors, or large generators are being operated. Equipment operation may produce noise levels that reach or exceed 85 decibels utilizing the A filter (dBA), the action level established by OSHA. Exposure to elevated noise levels can lead to temporary or permanent hearing loss, and can also cause muscle tension and irritability.

Noise levels in excess of 85 dB are likely to be generated due to the inherent nature of diesel engines on heavy equipment. Site workers on drilling crews, and anyone working in the immediate vicinity, will don either disposable earplugs or earmuffs. Site workers not directly involved in site activities in these areas will not be allowed in the area.

TI2E's SSHO and Alternate SSHO have completed the 30-hour OSHA Construction Safety training. Instruction on the use of and proper fitting of disposable earplugs was included in both classes. The SSHO will visually confirm workers hearing protection is properly fitted into the ear.

3.3.4 Biological Hazards

Potential biological hazards associated with working at the Nike site include bees, insects and spiders. While no specific biological hazards have been identified or communicated by the host,

TI2E employees and their subcontractors will be instructed to maintain awareness for biological hazards in their surroundings, especially when initially entering the work site. If any such hazards become known during the course of the project, the SSHO and/or the CSP will make the appropriate changes in this SSHP and communicate the dangers/concerns to the workers. Workers will exercise caution when traversing the site to avoid scorpions, insects, and rattlesnakes. No significant populations of any of the referenced potential biohazards have been identified at the work site.

Serious and/or threatening chemical and physical hazards frequently overshadow any potential exposure to biological hazards. However, specific biological hazards can cause injury and even death. Therefore, when appropriate, such hazards will be identified and evaluated in conjunction with all other actual or potential hazards associated with an operation, and steps taken to control exposure. Procedures as prescribed in the First Aid Book will be properly implemented. Paramedics will be summoned for workers exhibiting symptoms of allergic reaction to a biological hazard.

3.3.5 Radiological Hazards

Radiological hazards are not expected. Should radiological hazards be encountered during field activities, an amendment to this plan must be prepared.

4.0 SITE CONTROL AND WORK ZONES

Site access control during drilling and excavation operations will be conducted by TI2E employees who will be responsible for keeping work areas clear of unauthorized personnel. The TI2E SSHO will be responsible for maintaining site access control restrictions and keeping unauthorized and untrained personnel out of restricted access zones.

Visitors will not be permitted within active work areas. All visitors, regardless of affiliations or approvals, will not be permitted unless they provide documentation of the training and medical surveillance requirements specified in this plan, have read and signed this APP/SSHP, and are escorted. Under no circumstances shall anyone enter the area without authorization from the TI2E SSHO. This shall include client, utility, and regulatory representatives. A visitor sign in sheet will be maintained by TI2E, recording all who enter onto the site into the support zone. A Site Control Log will be used by the SSHO to record all personnel entering the work zone, the times at which they enter and depart, and their company affiliation. All visitors will be advised by the SSHO of the following upon arrival to the site:

- Safe work practices, such as proper site entry and egress, and proper hygiene during meal and rest breaks
- Recognition, in oneself and others, of physical conditions requiring immediate medical attention, especially heat stress, and application of simple first aid measures
- Procedures to be followed in case of emergencies

4.1 Site Work Zones

Work location restrictions will primarily be determined upon the potential physical safety concerns, as the potential for exposures to the COCs are highly unlikely to occur at or above their respective Permissible Exposure Limits (PELs). The site work zones shall include, but not necessarily be limited to, the following zones:

- Exclusion Zone (EZ)
- Contamination Reduction Zone (CRZ)
- Support Zone (SZ)

The EZ and CRZ will consist of any area in the immediate vicinity of the drilling rig and/or sampling activities. All employees will use appropriate PPE when working in those areas. The EZ will be defined as an area where there is a possible respiratory and/or contact health hazard and/or physical safety concern. In most instances, this area will be approximately a 30-foot radius from all intrusive site activities (i.e., drilling rig, test pit installations), in order to allow for safe movement of the equipment and the personnel in the work zone. Cones, yellow caution tape, or other appropriate means will identify the location of the EZ. The EZ and CRZ will be

subject to change based on the extent of contamination levels and changing site conditions. It is also possible, based upon the extent of contamination (or the lack thereof) that decontamination of site personnel may consist of dry-decon followed by thorough hand and face washing. Air monitoring (if applicable) will be conducted to determine contamination levels. The SSHO will restrict access to this area to site personnel. The personnel decontamination station will be located at the entrance to this area if deemed necessary by the SSHO.

The SZ includes the areas surrounding the EZ and CRZ. The SZ can be any area located outside of the CRZ where activity support may occur. The SZ will be located to prevent employees from being exposed to any particulate levels above regulatory limits, and to allow the safe movement and use of drilling equipment. Eating, drinking, or smoking will be permitted in the support area only after washing face and hands. Smoking will only be allowed in designated areas, and will not be permitted if flammables and/or gas cylinders are stored in the area and/or if hot work is being conducted. A Site Operations Center may be established if required.

4.2 Work Limitations

Work limitations include the following:

- No eating, drinking or smoking in the EZ.
- All persons must wear eye protective equipment when and where appropriate.

Facial hair must not interfere with the fit of the respirator or come in contact with the face of the respirator where the respirator touches one's face.

5.0 PERSONAL PROTECTIVE EQUIPMENT

5.1 Levels of Personal Protective Equipment

The harmful effects that chemical substances have on the human body often necessitate the use of respiratory protection and personal protective clothing. Proper selection of PPE depends upon a number of factors. Protection against different types of chemicals and differing concentrations of those substances can be quite varied. The tasks to be performed and the probability of exposure to the substances must also be considered when specifying protective clothing.

Once the specific hazard has been identified, appropriate PPE can be selected. The protection level assigned must match the hazard confronted. The specific equipment comprising each level of protection will vary slightly, but is defined primarily by the type of respiratory protective equipment used, and secondly by skin protection.

The following list briefly describes the various PPE Levels:

Level A: Used when the greatest level of skin, eye, and respiratory protection is needed and consists of a totally encapsulated suit with supplied breathing air

Level B: Used when the highest level of respiratory protection is needed, but a lesser level (than Level A encapsulating suit) of skin protection is required

Level C: Used when criteria for using air-purifying respirators are met, and a lesser level of skin protection is required

Level D: Used in areas without respiratory hazards

5.2 Anticipated Levels of Protection

The PPE Level will be determined by air monitoring discussed in Section 8.0. Based on the hazard analysis for the environmental project at the Nike site, Level D protective clothing is the anticipated primary level of protection to be worn during site activities. Table 5-1, Action Response Levels, summarizes the criteria developed utilizing OSHA 1910.1000 Table Z-2.

Table 5-1: Action Response Levels

Monitoring Device	Action Level	Action
PID or Equivalent	0 to 10 PPM above background levels in the breathing zone	Wear Level D PPE
PID or Equivalent	= or > 10 PPM above background levels in breathing zone	Engineering controls i.e., work up wind or ventilation, field

Table 5-1: Action Response Levels		
Monitoring Device	**Action Level**	**Action**
		personnel will don Level C respiratory protection until levels decrease below 10 ppm in the breathing zone. Contaminant specific (Benzene) detector tubes will be used to determine levels of concentrations and, if needed, a change in the level of PPE
PID or Equivalent	= or > 25 PPM above background levels in breathing zone	Work will be discontinued, personnel will evacuate to the predetermined safe area, and control measures initiated

PID: Photo-ionization Detector
PPM: Parts Per Million
PPE: Personal Protective Equipment

5.2.1 Level D

Level D protection is the minimum level of personal protection allowed on hazardous waste sites. Respiratory protection is not required, as the atmosphere is assumed breathable and uncontaminated.

Level D protection will consist of the "basic work clothing" plus:

- Hard hat
- Coveralls/standard work clothing
- Safety glasses with protective side shields
- Safety-toed work boots
- Chemical-resistant (nitrile) gloves and/or leather gloves

Earplugs or earmuffs with noise reduction ratings sufficient to attenuate the sound level will be mandatory during drilling activities due to the inherent nature of diesel engines and the sound generated by sonic drilling. Hard hats, safety glasses (goggles with splash shields or optional full-face shield), and safety shoes must meet American National Standards Institute approval.

5.2.2 Level C

Level C protection is defined by the use of either a full-face or half-face, air-purifying respirator. This level is used when low levels of contaminants of a known nature are present, sufficient

oxygen is available, and contaminants are not considered immediately dangerous to life and health. Level C will consist of Level D above plus:

- Half-face (or full face), air-purifying respirator with NIOSH approved filter cartridges, which are selected depending upon the type of exposure
- Chemical-resistant or polyethylene-coated disposable outer coveralls (e.g., Tyvek®)
- Chemical-resistant (e.g., butyl) outer gloves (taped to outer coveralls)
- Chemical-resistant (e.g., nitrile) inner gloves
- Chemical-resistant safety boots (taped to coveralls)

5.2.3 Levels A & B

Levels A and B protection are not anticipated during field activities. If it appears that these levels may be required, the SSHO will immediately shut down and secure the operation and contact the PM, HSPM/CSP, USACE point of contact (POC) for further guidance. The SSHO will be responsible for determining the appropriate level of personal protection to be used, based on the Action Response Levels established in this document. The SSHO, with the consent of the CSP and PM, shall notify the POC prior to implementing any modifications to the PPE or levels of protection.

5.2.4 Disposable Gloves Utilized in Level D PPE

When working in Level D PPE, site workers will utilize disposable nitrile gloves as their primary hand protection for site COCs. Leather gloves will also be available as another source of hand protection. If the worker is allergic to nitrile gloves, then latex or rubber gloves will be used. Nitrile gloves are made of synthetic rubber, contain no latex proteins, and offer good resistance to wear. They are more puncture resistant than many other types of rubber gloves and offer superior resistance to many types of chemicals, petroleum hydrocarbons included.

6.0 EXPOSURE MONITORING

This section outlines monitoring strategies that will be used to assess employee exposure to chemical hazards. The anticipated chemical hazards present on site are VOCs, SVOCs, metals, PCBs, and Total Petroleum Hydrocarbons (TPH). TI2E will utilize direct reading instruments to monitor for chemical hazards. All direct reading instruments will be calibrated before and after each period of use in accordance with manufacturers' recommendations and standard industrial hygiene practice. Records detailing date, time, span gas, or other standards used and the name of the person performing the calibration will be stored with the instrument. The direct-reading instrument will be calibrated in accordance with the standard operating procedures found in the operator's manual accompanying the instrument. The SSHO will charge the batteries and verify that instruments are fully charged before each use.

6.1 Perimeter/Personnel Air Monitoring Activities

To monitor petroleum hydrocarbon vapors emitted from the soil during drilling and sampling activities, TI2E will implement the use of a photo-ionization detector (PID). The PID is a real-time, direct-reading instrument for volatile organic vapors. The breathing zone of workers on-site will be monitored periodically. If the PID reading shows a sustained concentration greater than 10 parts per million (ppm), engineering controls will be implemented (i.e., field personnel will move to an upwind, safe location), and the SSHO will contact the PM, HSPM/CSP, and USACE POC for further instructions. PPE will not be upgraded due to consistent organic vapor readings in excess of 100 ppm or other work conditions; however, work will stop until the APP/SSHP has been revised to reflect new working conditions or conditions subside. Action levels for respiratory protection are provided in Table 5-1, Action Response Levels.

6.2 Meteorological Monitoring Activities

On-site, ambient weather conditions (wind speed and direction, temperature, and relative humidity) will be monitored continuously via real-time Internet weather locations, and/or the National Weather Service. If a local station can provide data relevant to the site, its website will be used to obtain forecasts. On-site meteorological conditions will be observed by the SSHO for change in direction, magnitude, incoming storms, or conditions favorable for lightning. More stringent controls will be in place when wind direction is such that residences or populations are downwind from the site.

6.3 Dust Control Activities

TI2E will implement appropriate procedures to control the generation of airborne dusts and vapors by monitoring drilling and excavation activities. Such procedures may include, but will not be limited to, the following:

- Emissions of fugitive dust from any active operation or disturbed surface area shall not be allowed such that the presence of dust remains visible in the atmosphere beyond the sites property line.
- If necessary, dust generation will be controlled by misting onto these materials prior to and as they are poured.

6.4 Noise Monitoring

Noise monitoring will not be performed because noise levels in excess of 85 dB are likely to be generated due to the inherent nature of diesel engines and drilling equipment. Therefore, hearing protection will be required during drilling activities. Site workers not involved directly with site activities in this area will not be allowed in the area unless hearing protection is donned.

7.0 DECONTAMINATION

Decontamination involves the physical removal and/or neutralization of harmful contaminants. The extent of decontamination depends on the hazard and the quantities of the contaminant. Contamination can occur from:

- Contacting vapors, gases, mists, or particulates;
- Splashes while sampling or opening containers;
- Walking or driving through puddles or on contaminated soil;
- Handling contaminated instruments, protective clothing, or equipment; and
- Assisting contaminated personnel during project operations, decontamination procedures, and emergencies.

All decontamination will be performed by personnel wearing a level of protective gear that is appropriate for the level of decontamination.

7.1 Decontamination Procedures

Contaminant reduction procedures appropriate for the existing work area will be implemented as explained in Sections 9.3 and 9.4 below.

7.2 Personnel Decontamination

Decontamination procedures are performed on all personnel leaving hazardous waste sites. A procedure appropriate to the degree of contamination recorded will be utilized. Site personnel will use single-use Nitrile gloves during sampling activities to reduce the chance of exposure to potential COCs. Disposable gloves will be disposed of and replaced frequently by site workers to avoid exposure to regulated chemicals.

7.2.1 Level D Personnel Decontamination

When the use of Level D (Section 5.2.1) PPE is required, personnel will perform decontamination in accordance with the following guidelines:

- Place tools, instruments, samples and trash at an appropriate location. Plastic bags will be available for trash. Waste PPE will not be placed in the same containers as general trash.
- Inspect equipment and samples and, if applicable, tools for signs of residual amounts of contamination or excessive soil buildup. If present, soils and contamination must be completely cleaned off of equipment, samples, and tools prior to removal from the EZ.

- Personnel will visually check themselves for signs of excessive soils and possible contamination. If observed, gross soils and contamination will be completely removed before further decontamination is performed.
- Prior to exiting the work areas, personnel will wash their hands with soap and water in order to minimize the potential for contaminant exposure.

7.2.2 Level C Personnel Decontamination

Personnel involved in site activities that require the use of Level C PPE (Section 5.2.2) will observe the decontamination procedures outlined below:

- Place tools, instruments, samples and trash at an appropriate location. These areas should be clean and dry and will be supplied with plastic trash bags. Waste PPE will not be placed in the same containers as general trash.
- Inspect equipment and tools for signs of residual amounts of contamination or excessive soil buildup. If present, soils and contamination must be completely cleaned off of equipment, samples, and tools prior to removal from the EZ areas.
- Personnel will visually check themselves for signs of excessive soils and possible contamination. If observed, soils and contamination will be completely removed before further decontamination is performed.
- Wash and rinse outer work gloves and boots (boot covers) with soap and water;
- Wash/brush off outer protective coverall (Tyvek®).
- Untape wrists and ankles.
- Remove outer work gloves and place them in a specified waste PPE container.
- Remove outer Tyvek® coveralls and place them in a specified waste PPE container.
- Remove eye protection.
- Remove respirator mask, if worn.
- Wash hands using a soap and water solution.

7.3 Equipment Decontamination

Decontamination will be performed on tools and the decontamination equipment itself after all site activities have been completed, or between sampling locations. Before entering the site, all equipment will be cleaned to remove any residual soil and potential contaminants. General equipment decontamination consists of an Alconox® soap and water wash followed by a double deionized water rinse. Equipment decontamination will take place in the CRZ according to the following procedures. Wash water will be containerized, characterized, and disposed according to the procedures described in Section 7.4.

7.3.1 Tools

Generally, tools will be washed with a detergent solution and then a final rinse with de-ionized water. Wooden tools will not be used, as they cannot be adequately decontaminated due to their porous nature and absorptive properties.

7.3.2 Heavy Equipment Decontamination

Excess soil will be removed from drilling and excavation equipment, comingled with the drill cuttings, and transported to the disposal facility. Drilling, excavation, and sampling equipment will be decontaminated between borings/test pits/sample locations utilizing a steam cleaner or pressure washer with a non-phosphate detergent.

7.3.3 Respirator Decontamination

Respirators, when worn, will be discarded or decontaminated daily. Taken from the storage area, the masks will be disassembled; the cartridges either set aside or disposed of, and the respirator placed in a cleansing solution. Personnel will inspect their own masks to ensure proper strap adjustment for correct fit. Certain parts of contaminated respirators, such as the harness assembly or cloth components, are difficult to decontaminate. If grossly contaminated, they will be discarded and replaced.

In addition to decontamination, all respirators, protective clothing, and other personal articles must be sanitized before they can be used again. The insides of masks become soiled from exhalation, body oils, and perspiration. Field personnel shall follow the manufacturer's instructions for respirator mask sanitization.

7.4 Disposal of Decontamination Waste

Decontamination rinsate water will be collected and temporarily stored on site in labeled, 55-gallon drums with bunghole tops pending characterization and disposal. The drums will be removed by a licensed waste hauler and disposed of or recycled at an approved landfill or recycling facility. The drums will be clearly labeled for content, the operation from which they were filled, and the dates. Waste will not be stored on site for more than 60 days. Drums containing waste materials generated during site activities will be stored on pallets; no drums will be left on the ground.

7.5 Decontamination During Emergencies

Often during emergencies, the need to quickly respond to an accident or injury must be weighed against the risk to the injured party from chemical exposure. Time lost or the additional handling of an injured person during the decontamination process may cause greater harm to the individual than the exposure that would be received by undressing that person without "textbook" decontamination. This decision must be made by the SSHO. The SSHO, as the on-

site focus for safety matters, must be familiar with the safety criteria and the logic behind them. Each operation is different, and the risks to personnel from exposure versus injury vary.

If personal decontamination must be delayed because immediate transport to the emergency facility is critical, the worker will be wrapped in plastic to prevent cross contamination of the ambulance and to protect emergency responders from being exposed to contaminants from the worker's clothing. A site representative shall accompany the injured person to the medical facility to assist or provide guidance to medical personnel in matters concerning decontamination of the injured worker. A copy of the SSHP will accompany the injured worker to the medical facility. The TI2E PM will verify facility acceptance standards as to receiving injured personnel with residual contamination.

7.5.1 Physical Injury

Physical injuries can range from minor to life threatening. Life-saving care should be instituted immediately without considering decontamination. The outside garments can be removed (depending on the weather) if this does not cause delays, interfere with treatment, or aggravate the problem. Considering the SOW, this type of situation is not expected to happen at this site with workers adhering to safe working practices, as provided in the SSHP. For minor medical problems or injuries, the normal decontamination procedure should be followed.

If the outer contaminated garments cannot be safely removed, the individual should be wrapped in plastic or blankets to help prevent contaminating medical personnel and/or the inside of ambulances. Outside garments are then removed at the medical facility. No attempt should be made to wash or rinse the worker unless it is known that he has been contaminated with an extremely toxic or corrosive material that could also cause severe injury or loss of life. For minor medical problems or injuries, the normal decontamination procedure should be followed. The need for additional protective clothing or excessive contamination of Level C or D clothing during site activities associated with the approved SOW is not anticipated.

7.5.2 Heat Stress

Heat-related illness ranges from heat fatigue to heat stroke, the latter being the most serious. Heat stroke requires prompt treatment to prevent irreversible damage to health or death. Protective clothing may have to be cut off. Less serious forms of heat stress require prompt attention, or they may lead to a heat stroke. Unless the worker is obviously contaminated, decontamination should be minimized and treatment begun immediately.

7.5.3 Chemical Exposure

Chemical exposure can be divided into two categories.

1. Direct contact through touch (e.g. acid burns), inhalation, and/or ingestion

2. Indirect contact through gross contamination of clothing or equipment

Only a qualified physician can treat contaminant inhalation and/or ingestion injuries. If the contaminant is on the skin or in the eyes, immediate measures must be taken to counteract its effect. First-aid treatment will involve flooding the affected area with copious quantities of water. The treatment of acid or alkaline exposure will also be the same.

When protective clothing is grossly contaminated, contaminants may be transferred to the wearer or to treatment personnel and cause injuries. Unless splashing may cause severe medical problems, the protective clothing should be washed off as rapidly as possible and carefully removed. Personnel must be aware of the chemical properties of the site hazards as well as the decontamination rinse solutions used to prevent cross contamination during field activities.

8.0 EMERGENCY PROCEDURES

This section describes emergency action procedures to be implemented at the site in case of an accidental spill or release of regulated substances. This section is consistent with the requirements of 29 CFR 1910.38 / CFR 1910.120(q)(1) and local, state, and federal disaster and emergency management plans. This Emergency Action Plan (EAP) will be implemented to prevent or minimize the impacts of unplanned events that could affect the safety and health of site workers or base personnel. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area are not considered to be emergency responses within the scope of this standard.

No regulated chemicals other than fuel in fuel tanks and hydraulic fluid in the drilling equipment will be on-site during project work. MSDSs for all chemicals anticipated to be onsite are provided in Attachment 4 of the APP. The potential for an uncontrolled release of large volumes of hazardous materials is remote.

The following sections discuss pre-emergency planning, personnel roles and lines of authority, emergency recognition and prevention, evacuation routes and procedures, emergency contacts and notifications, hospital route directions, emergency medical treatment procedures, protective equipment failure, fire or explosion, weather-related emergencies, spills or leaks, emergency equipment and facilities, and reporting.

The SSHO will conduct (and document) an emergency response/evacuation drill during the first day of work. He or she will also conduct unannounced tests of this EAP and record subsequent site worker responses to the simulated emergency situations. The SSHO and the HSPM will review the worker responses and, if necessary, prepare an addendum to the SSHP identifying revisions to the EAP. Results of this review will be discussed with all site workers in subsequent tailgate safety meetings.

8.1 Pre-Emergency Planning

All employees working at the site will be trained in the provisions of this EAP during the initial site safety briefing, and be updated of changes and/or reminded of these provisions as necessary during the daily tailgate safety meetings. The SSHO will review this EAP on a regular basis to ensure that the provisions of this plan are adequate and consistent with the current site conditions. The plan will be amended, if necessary, to keep it current with new or changing site conditions or information. This includes changing or moving the evacuation route or meeting area that the workers are directed to meet at following a site evacuation. The location of and access to the spill response equipment will be discussed and any personnel unfamiliar with deployment of sorbent booms onto the ground will be trained in the appropriate manufacturer's

recommended deployment procedure. Proper deployment of sorbent pads and/or sorbent granular material onto the liquid will also be rehearsed.

8.2 Personnel Roles and Lines of Authority

The SSHO will also serve as the EAC for this project. The SSHO/EAC has the primary responsibility for responding to and correcting emergency situations, and for responding appropriately to ensure the safety of site personnel and the public. The SSHO/EAC will have the authority to cease any response activity if the safety of responders, site personnel, or the public is threatened. The SSHO/EAC's duties will include:

- Maintaining emergency preparedness;
- Performing site inspections and informing site workers and subcontractors of work activities and emergency action plans;
- Coordinating with emergency services prior to and during an emergency action scenario;
- Making notifications to appropriate authorities; and
- Preparing follow-up reports.

Site personnel are required to report all injuries, illnesses, spills, fires, and property damage to the SSHO/EAC. The SSHO/EAC must be notified of any on-site emergencies and is responsible for ensuring that the appropriate emergency procedures described in this section are followed.

Subcontractors are required to coordinate with the SSHO/EAC concerning activities associated with their individual scopes of work.

8.3 Emergency Recognition, Prevention, and Response

Table 8-1, Emergency Recognition, Prevention, and Response, of this APP/SSHP identifies potential emergency scenarios and provides emergency recognition, prevention, and response guidance for each scenario. All on-site personnel will be made familiar with this information through pre-work training and tailgate safety meetings. All site personnel and visitors will be made aware of their responsibility in notification and warning of any identified emergency situations.

Table 8-1: Emergency Recognition, Prevention, and Response

Recognition	Prevention and Response
Emergency Scenario - Employee Injury/Illness	
Employees who have been exposed to site contaminants without the	**Prevention:** The provisions of the SSHP, including the Activity Hazard Analyses, will be followed to prevent injury and illness.

Table 8-1: Emergency Recognition, Prevention, and Response	
Recognition	**Prevention and Response**
use of respiratory protection will report the exposure to their supervisor and the SSHO. Employees who feel they are suffering symptoms of exposure to site contaminants or have suffered an injury will also report to their supervisor and the SSHO. Employees should observe each other for signs and symptoms of exposure to site contaminants and other environmental stress. Signs of exposure include the following: • Skin discoloration • Excessive perspiration • Lack of coordination • Staggered gait • Sleepiness, dizziness, drowsiness • Incorrect responses to questions • Irritability or irrational behavior	**Response:** If an injury occurs due to an accident or exposure to site contaminants, the SSHO will be notified immediately. The SSHO will be provided with all appropriate information concerning the nature and cause of the injury to allow treatment preparations to be initiated. The PM will be notified and will investigate the cause of the injury and make any necessary changes in work procedures. Personnel Injury in the EZ – Upon notification of an injury in the EZ, work will immediately cease and an assessment of the injured person will be made. If the injury was the result of a site emergency situation, all personnel will evacuate the site and assemble at the pre-determined safe area. If it is a local problem, personnel in the work area will evacuate to the decontamination reduction area. If the injured party(s) can be evacuated without the risk of further injury, they will be removed from the work zone immediately. If not, stretchers will be obtained to evacuate the injured party(s). The nature of the injury will be evaluated and the affected personnel will be decontaminated to the highest extent possible prior to movement to the support zone. The appropriate first aid will be administered and contact will be made for an ambulance with the designated medical facility, if required. No persons will re-enter the EZ or work area until the cause of the injury or symptoms is determined. If the injury is the result of chemical exposure, an assessment of potential airborne contaminant concentration will be performed using field instrumentation. Rescue will be performed in a level of protection appropriate for the anticipated airborne contaminant concentrations. Emergency decontamination procedures are described in Section 7.5. A copy of the decontamination procedures will be given to the local ambulance and emergency room personnel. Personnel Injury in the SZ – Upon notification of an injury in the SZ, the SSHO will assess the nature of the injury. If the cause of the injury or the loss of the injured person does not affect the performance of the site personnel, operations will continue with appropriate first aid and necessary follow-up as stated above. If the designated emergency signal is sounded, all site personnel will move to the pre-designated safe area and wait for further instructions. Activities at the site will stop until any added risk is removed or minimized.
Emergency Scenario - Fire/Explosion	

Table 8-1: Emergency Recognition, Prevention, and Response	
Recognition	**Prevention and Response**
All fires and visible smoke will be immediately reported to the SSHO and the PM.	**Prevention:** The primary goals of fire prevention and protective measures are to control ignition sources and early detection and rapid response. The following preventative measures will be taken at the site: • Smoking will be prohibited at the site except in designated areas • No welding, open flames, or spark-producing activities will be allowed on-site unless evaluated and approved by the SSHO • Only approved containers will be used to store flammable and combustible liquids **Response:** In the event of a fire or explosion, site evacuation procedures will be implemented and emergency response services will be notified. TI2E personnel will only attempt to extinguish small incipient fires (e.g., fires that can be extinguished with available portable fire extinguishers). In the event of larger fires, TI2E will notify the proper authorities and evacuate the site in accordance with the Emergency Response Plan.
Emergency Scenario - Environmental Release	
Visual observations of leaking pipes and containers or puddles of unknown liquids will be reported to the SSHO and the site supervisor immediately. The SSHO will report the incident to the PM. The air monitoring program discussed in Section 6.0 of the SSHP will be the primary recognition tool for air releases.	**Prevention:** All liquids will be stored in approved containers. Any pipe connections involved in the project will be tightened before use and checked regularly for signs of leaks. Additional spill and discharge information is provided in Section 9.2.2 of the APP. Engineering controls such as dust suppression will be used to minimize the release of airborne contaminants. **Response:** Response to an environmental release will involve ceasing site work, notification of the Navy and Facility points of contact and appropriate federal, state and local agencies, and implementing spill or dust control procedures. In the event of a severe spill or leak, site personnel will follow the procedures listed below: • Evacuate the affected area and relocate personnel to the pre-determined safe area • Inform the SSHO, the site supervisor, and the PM immediately • Locate the source of the spill or leak and stop the flow if it is safe to do so • Begin containment and recovery of spilled or leaked materials • Notify appropriate federal, state and local agencies
Emergency Scenario - Miscellaneous Emergencies (weather, adverse community activity, etc.)	

Table 8-1: Emergency Recognition, Prevention, and Response	
Recognition	**Prevention and Response**
Any forecasts of severe weather conditions or indications of adverse community activities (e.g., vandalism, threats, pickets, etc.) will be reported immediately to the PM.	**Prevention:** TI2E will take reasonable measures to protect the site and site personnel against other potential emergency situations such as severe weather and adverse community activities. Preventative measures will include securing temporary office and storage facilities, grounding of buildings and electrical systems, and implementation of site security and control measures. **Response:** All outdoor work will immediately cease at the first indication of lightning in the area. The safety of work in high winds or other severe weather conditions will be assessed by the SSHO. The SSHO will cease site operations if weather conditions will not allow the safe conduct of work. TI2E will not respond to any adverse community situation other than to obtain as much information as possible and to report that information to the USACE and Project POCs, or in the case of an emergency, contact the appropriate authorities.

8.4 Site Security and Control

Work areas will be delineated with traffic cones, barricades, and/or yellow caution tape. Site control zones will be established as described in Section 6.0 of this APP/SSHP to control the spread of contamination and employee exposure to chemical and physical hazards. Access to the exclusion zone will be restricted to authorized personnel only. The perimeter of a delineated EZ will be established in a manner that will provide adequate room for the number of workers involved, their equipment, and be a safe distance and method of travel to the decontamination area. There will be an EZ/CRZ Site Control Log maintained at the point of entry to the CRZ. All tools, equipment, and materials will be stored in work vehicles or a secure area for overnight storage. Such overnight storage locations will be identified by the POC for the facility. Temporary storage facilities will be equipped with locks that will be secured at the end of each work shift.

8.5 Evacuation Routes and Procedures

The on-site communication systems that will be used for this project include the use of an air horn, hand signals, and cellular phones among workers. Workers are to use the "buddy system" at all times and be cognizant of the reduction of communication abilities in high noise areas and/or poor air cellular service areas. Hand signals that will be used by site personnel in emergency situations or when verbal communication is difficult are listed in Table 8-2.

Table 8-2: Hand signals to be used in emergency situations	
Signal	**Definition**
Hands clutching throat	Out of air or cannot breath
Hands on top of head	Need assistance
Thumbs up	Okay, I am all right, or I understand
Thumbs down	No or negative
Arms waving upright	Send backup support
Gripping partner's wrist	Exit area immediately

In the event of an emergency that necessitates an immediate work stoppage or site evacuation, the air horn shall be used by the SSHO to alert site personnel. One extended blast of the air horn will signal an immediate work stoppage, with all personnel moving into a predetermined meeting/safe area.

Whenever possible, evacuation should be in the direction perpendicular to the wind direction without passing through the plume or smoke cloud, if any. The emergency meeting location and site evacuation route for the site will be communicated to site personnel during the morning tailgate meeting, and the evacuation route map will be reviewed during the daily tailgate safety meeting. Personnel will remain in the emergency meeting area until the SSHO or his/her authorized representative provides further instructions.

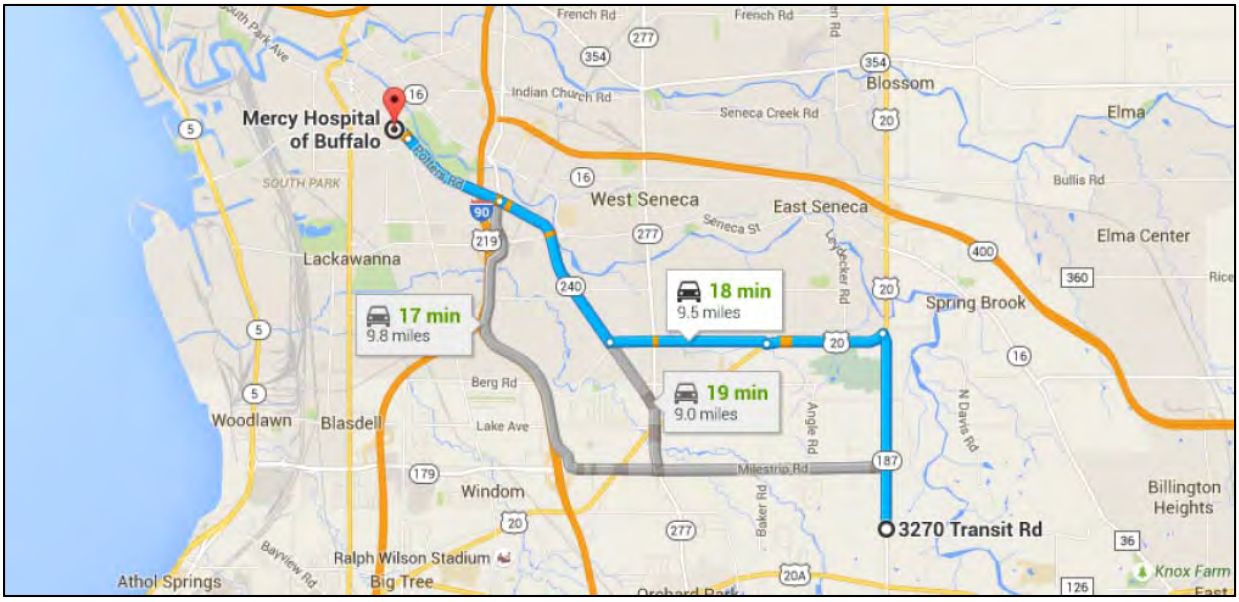
8.6 Emergency Contacts and Notifications

The name, telephone number, and location of police, fire, and other emergency response agencies will be available on site at all times. If emergency personnel are called to the site, efforts should be made to accommodate their operations at the site. Emergency telephone numbers for this project are presented in Table 8-3, Emergency Telephone Numbers. In the event of a medical emergency, personnel will notify the appropriate emergency organization and will take direction from the SSHO. In the event of a fire, explosion, or spill at the site, the SSHO will notify first responders and the appropriate federal, state, and local agencies and will follow the procedures discussed in Table 8-1, Emergency Recognition, Prevention, and Response.

Table 8-3: Emergency Telephone Numbers		
Emergency Services		
First Responders Mercy Hospital of Buffalo Emergency Room Poison Control Center National Response Center OSHA, Buffalo Area Office OSHA Referral		911 (716) 826-7000 (716) 662-0500 (800) 523-2222 (800) 424-8802 (716) 551-3053 (800) 321-6742
USACE		
Penelope Reddy	Engineering Manager	Office: (978) 318-8160
TI2E		
Keith Fields Bob Janosy Ben Headington Sanjaya Ranasinghe	Project Manager Site Health & Safety Officer Alternate Site Health & Safety Officer Health and Safety Program Manager/Certified Safety Professional	Office: (614) 792-2896 Mobile: (614) 778-2618 Mobile: (614) 593-5541 Mobile: (614) 348-8939 Office: (410) 540-8700

8.7 Emergency Medical Treatments and First Aid

A first aid kit and fire extinguisher will be located in the SZ or as appropriate. The first aid kit will contain the American Red Cross first aid manual or equivalent. A minimum of two personnel trained and certified in adult first aid, cardiopulmonary resuscitation (CPR), and bloodborne pathogens, in accordance with 29 CFR 1910.1030, will be on-site at all times that work is being performed. If an injured individual requires further attention, the individual will be immediately transported to the nearest hospital. A hospital route map for the Mercy Hospital of Buffalo, Emergency Room is presented in Figure 8-1 and Figure 8-2 for the Control Area and Launch Area, respectively. If necessary, the worker will be decontaminated prior to transport to the facility; if the injury is serious, decontamination may be delayed pending emergency treatment. As explained earlier, concentrations of the COC anticipated to be encountered at these sites are not considered acutely toxic and should not prevent the implementation of emergency medical care.

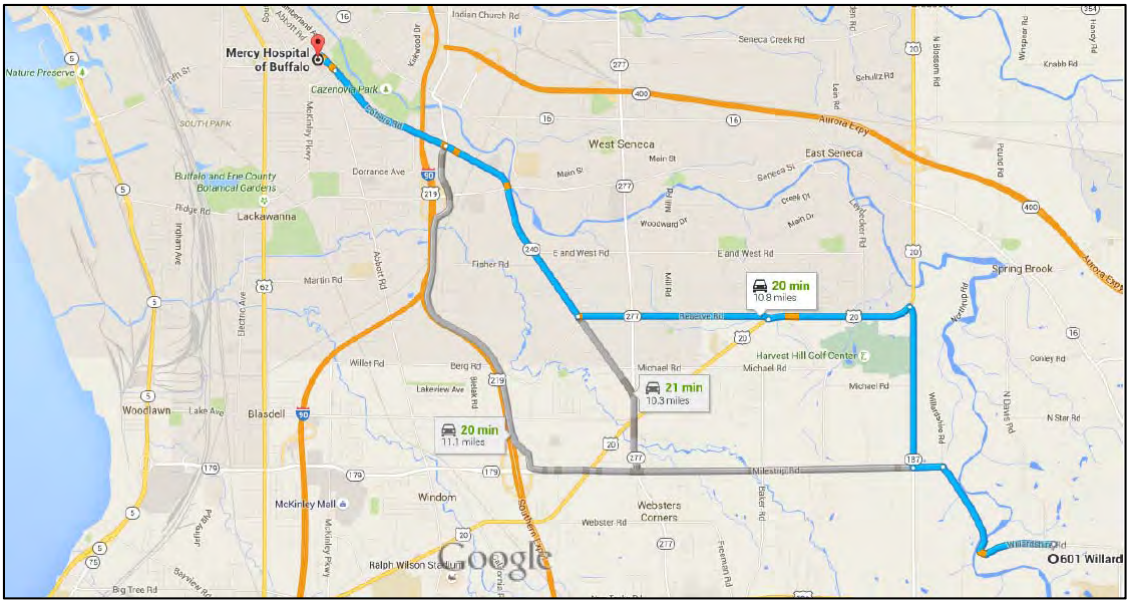


3270 Transit Rd
Orchard Park, NY 14127

1. Head north on NY-187 N/Transit Rd toward Milestrip Rd — 2.4 mi
2. Turn left onto US-20 W/Southwestern Blvd — 1.4 mi
3. Turn right onto Reserve Rd — 1.9 mi
4. Turn right onto Orchard Park Rd — 2.2 mi
5. Continue straight onto Potters Rd — 1.4 mi
6. Continue onto Abbott Rd
   Destination will be on the left — 0.2 mi

Mercy Hospital of Buffalo
565 Abbott Road, Buffalo, NY 14220

Figure 8-1: Hospital Route Map for Control Area Site



601 Willardshire Rd
East Aurora, NY 14052

Follow **Willardshire Rd** and **NY-187 N/Transit Rd** to **US-20 W/Southwestern Blvd** in West Seneca

3.6 mi / 6 min

1. Head west on Willardshire Rd toward N Davis Rd — 1.7 mi
2. Slight left onto Milestrip Rd — 0.3 mi
3. Turn right at the 1st cross street onto NY-187 N/Transit Rd — 1.6 mi

Turn **left** onto **US-20 W/Southwestern Blvd** — 1.4 mi / 2 min

Continue on **Reserve Rd**. Take **Orchard Park Rd** to **Abbott Rd** in Buffalo

5.7 mi / 12 min

5. Turn right onto Reserve Rd — 1.9 mi
6. Turn right onto Orchard Park Rd — 2.2 mi
7. Continue straight onto Potters Rd — 1.4 mi
8. Continue onto Abbott Rd
   Destination will be on the left — 0.2 mi

Mercy Hospital of Buffalo
565 Abbott Road, Buffalo, NY 14220

Figure 8-2: Hospital Route Map for Launch Area Site

General first aid procedures are outlined below:

- Skin/Eye Contact: Use copious amounts of soap and water. Wash/rinse affected area thoroughly and then provide appropriate medical attention. Eyewash and emergency shower or drench system will be provided on-site at the SZ or as appropriate. Eyes should be rinsed for 15 minutes if there was chemical contact with the eyes. The eyewash station will be ANSI-certified and will meet the Z¬358.1-2004 standard. This eyewash station will be capable of providing flushing fluid to the eyes at 1.5 liters per minute (0 to 4 gallons per minute) for a minimum of 15 minutes.

- Inhalation: Move to fresh air and, if necessary, decontaminate and transport to hospital. Any loss of consciousness or exposure to airborne toxic substances, even if the individual appears to have fully recovered, will require immediate treatment or surveillance by a qualified physician.

- Ingestion: Notify Poison Control Center and emergency medical facility and transport to nearest emergency medical facility immediately.

- Puncture Wound or Laceration: Decontaminate and transport to emergency medical facility. Apply direct compression to stop or slow the flow of blood. Universal precautions to prevent contacting the blood of another shall be implemented.

8.8 Emergency Response Equipment

Based on similar work, the low potential for spills, and the lack of acutely toxic concentrations, it is anticipated that the specified safety equipment worn (U.S. EPA Level D) by the workers will be sufficient for the emergency action events that may occur at this site. The hazard analyses conducted at this site did not identify a risk of a release of potentially flammable or explosive substances.

EPA Level D PPE will include hard hats, steel-toed boots, work gloves, chemical resistant gloves (as needed), hearing protection (as necessary), and eye protection.

In addition, the following emergency equipment will be available at the site:

- First aid kit
- Eye wash station (portable)
- Fire extinguisher
- Mobile phone
- Sorbent booms and granular material
- Drums
- Spill kits

8.9 Reporting

All emergency situations require follow-up and reporting. Attachment 2 to the APP, TI2E Health and Safety Forms, includes the TI2E Injury and Illness Report. This report must be completed and submitted to the PM within twenty-four (24) hours of an emergency situation. The PM will review the report and forward it to the SSHO for review. The report must include proposed actions to prevent similar incidents from occurring. The SSHO must be fully informed of the corrective action process so that he or she may implement applicable elements of the process in the future.

The USACE PM will be notified within four (4) hours of the incident, following administration of necessary first-aid procedures to workers, if applicable. If the accident is serious and the injury(s) results in permanent disfigurement, loss of limb or death, the area will be immediately secured and will not be released until authorized by the USACE PM. OSHA will be notified within eight hours. The USACE contractor incident/accident reporting procedure is described in depth in Section 13.0.

9.0 MEDICAL SURVEILLANCE

9.1 Medical Examination Requirements

TI2E site personnel (as outlined in TI2E's Health and Safety Program) and subcontractor project personnel working on-site will have undergone either a baseline or annual medical monitoring examination within 12 months prior to participation in fieldwork. Medical screening is conducted at the start of employment and annually thereafter and may consist of the following as directed by the medical doctor:

- Medical and occupational history
- Physical examination, with particular attention to the cardiopulmonary system, general physical fitness, skin, blood forming, hepatic, renal, and nervous systems
- Urinalysis
- Blood analysis
- OSHA Noise questionnaire
- Pulmonary function test
- Chest X-ray
- Audiogram
- Electrocardiogram

Based on this examination, the physician will certify in writing whether the individual is capable of full participation in the program, or whether that person must work within certain restrictions. Personnel may be excluded from this project for medical reasons. Any person suffering a lost-time injury or illness must have medical approval prior to returning to work on site.

9.2 Record Keeping

All medical records must be maintained by the employer for a period of at least 30 years after the employee's termination of employment, in accordance with OSHA regulations on confidentiality and record keeping. Prior to the initiation of work, subcontractors will submit copies of their medical fitness certifications to the TI2E SSHO for each employee to be assigned to the site. The certifications will state that the employee has received a medical examination within the previous 12 months and has been determined fit to perform on-site work.

10.0 TRAINING

It is recognized that conditions on a site may change or that more information may become available during the operation. If during field activities, it is determined that the conditions are not as described, or the protection specified in the APP and SSHP require modifications, work will cease, and the SSHO will contact the PM for guidance. Work will not resume until authorized by the PM.

In addition to conducting the daily tailgate meetings (which may include supplemental safety training), the SSHO will conduct a Site Supervisors' safety meeting at least once a month. These monthly Supervisor safety meetings will include a discussion on past and present safety issues on site, plans for new or changed activities, reviewing the appropriate AHA (by trade), establishing safe working procedures for anticipated hazards, and providing pertinent health and safety training and reinforcement.

10.1 General Personnel – Training

All TI2E personnel are required to attend new employee orientation training. This training includes:

- Hazard Communication/Petroleum Hydrocarbons/Pesticides
- Emergency Action Response Procedures
- Basic Safety Training
- A review and discussion of the Corporate Health & Safety Policy

10.2 Field Personnel – Training

Subcontractors are to provide acceptable certification of training for all personnel on site. At a minimum, all subcontractor personnel will be required to provide 40-hour HAZWOPER Training and applicable 8-hour Refresher Training Certificates prior to the start of fieldwork. These documents will be presented to the SSHO before any field activities take place. Mandatory training (which must be current) required on this project includes:

1. An initial 40-hour HAZWOPER Training Class
   - Workers will have 3-days of on-site, supervised field training
   - Supervisors will have 3-days of on-site supervised field training with at least 8 additional hours of specialized training at the time of job assignment (i.e., on the following programs: Company's Health & Safety policy, employee training, PPE, spill containment and health hazard monitoring and techniques).

2. An annual 8-hour HAZWOPER Refresher Training class and OSHA Construction Safety Training
   - The SSHO and/or Alternative SSHO shall have completed the 30-hour OSHA Construction Safety Training.
   - Potential Topics covered in these classes include the following:
     - Introduction to OSHA
     - Hazard Communication/Lead and Asbestos
     - Cranes/Rigging
     - PPE
     - Confined Space Entry
     - Legal Issues
     - Fall Protection
     - Electrical Safety
     - Material Handling
     - Excavations, Trenching, and Shoring
     - Ladders/Stairs
     - Scaffolds
     - Steel
     - Demolition

3. At least two (2) personnel with current Adult First Aid/Adult cardiopulmonary resuscitation (CPR) and Bloodborne Pathogens Training (in accordance with 29 CFR 1910.1030 and 8 CCR 5193) will be on site at all times during site work.

4. Hazard Communication Training

5. PPE Training

6. The SSHO or his/her alternate will be the competent person on site when any fieldwork associated with this project is being conducted. The competent person will have experience in mobilization, site set up, soil sampling, use of protective systems, and requirements of 29 CFR 1926.650-652.

7. All heavy equipment operators will have received proper training and have extensive experience. No certification and/or licensing are required for heavy equipment operators. Drillers will possess a current drilling license.

Records of employee qualifications are kept in the TI2E corporate office. As required by OSHA regulations (29 CFR 1926.65), all TI2E on-site employees have received 3 days of supervised field training and an 8-hour supervisor class. All site personnel will complete this initial

HAZWOPER training before assignment to this project. The course content of this training will include, but not be limited to, the following:

- Names of personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on the Site
- Use of protective clothing and equipment
- Work practices by which the employee can minimize risks from hazards
- Safe use of engineering controls and equipment
- Medical surveillance requirements including recognition of symptoms and signs which might indicate overexposure to hazards
- Emergency response procedures
- Refresher training requirements

In addition, the on-site management, supervisors, and SSHO will receive additional management training, which will include, but not be limited to, the following:

- The employer's safety and health program
- Associated employee training program
- PPE program
- Spill containment program
- Health hazard monitoring procedures and techniques
- CPR/First Aid Training

The SSHO will keep copies of the certifications for the completion of such training for all site workers on site in a file. Workers without such certification will not be allowed to work at the site. Prior to commencement of field operations at the project site, personnel will receive site-specific training (briefed in the tailgate safety meeting). This training will include a review of all information contained in this SSHP, with particular emphasis on the following:

- Types and anticipated levels of hazardous substances known to be present on site, their PELs, health effects, and exposure routes
- The need for PPE
- The importance of maintenance and attention to proper fit of PPE
- Prescribed decontamination procedures
- Safe work practices, such as proper site entry and egress, and proper hygiene during meal and rest breaks
- Recognition in oneself and others of physical conditions requiring immediate medical attention, especially heat stress and application of simple first aid measures
- Procedures to be followed in case of emergencies

11.0 ADVERSE WEATHER CONDITIONS

In the event of adverse weather conditions, the SSHO will determine if work can continue without endangering the health and safety of the field workers. The SSHO will monitor the weather news morning and afternoon through the radio or internet, and will document it in the contractor production report. He or she will also coordinate with a local weather center, if available, to obtain specific information about the current weather conditions. Some of the items to be considered prior to determining if work should continue are:

- Potential for frostbite and cold-related injuries
- Dangerous weather-related working conditions (e.g., high winds, rain, snow, lightning, smog, fog)
- Limited visibility
- The potential for electrical storms (no outdoor activities will be permitted during electrical storms)

12.0 PERSONAL HYGIENE AND SANITATION

TI2E will establish and maintain basic sanitation provisions for all employees and subcontractors. TI2E will ensure that an adequate supply of drinking water is available at the job site while work is being performed. Access to public toilets or rental of portable toilets with hand-washing capacity will be afforded to site workers when needed. The supervisor will assure that adequate breaks are given for personnel to use the toilet facilities and water intake. The SSHO will ensure that employees wash their hands and faces thoroughly before breaks, before lunch, and at the end of the workday.

No eating, drinking, smoking, or applying cosmetics will be allowed in the CRZ or EZ. Drinking water will be available in the SZ during working hours. Plastic bags or steel containers will be provided for the collection of refuse and disposable garments and materials. Good housekeeping practices will be enforced at all times.

13.0 REFERENCES

Chemical Information File, USDOL-OSHA, 1985.

National Institute of Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards, DOHS Pub No. 2005-149.

Occupational Safety and Health Administration (OSHA). Occupational Safety and Health Administration Standards, Title 29 CFR, Parts 1910 and 1926, United States Department of Labor, Occupational Safety and Health Administration.

Occupational Safety and Health Administration Standards, Title 29 CFR, Sections 1910.1001 and 1926.58 (as amended), 1910.134, 1910.20, and 1910.1200.

1989b. Hazardous Waste Operations and Emergency Response, Final Rule. 29 CFR 1910.120.54 FR 9294, March 6.

1985. Guidance Manual for Hazardous Waste Site Activities, NIOSH/OSHA/EPA/ USCG, DHH, Publication No. 85-115.

U.S. EPA. See United States Environmental Protection Agency Standards.

United States Army Corps of Engineers, 2008. Safety & Health Requirements Manual, EM 385-1-1, September 15.

United States Department of the Navy, 2006. Environmental Restoration Program Manual, August.

ATTACHMENT 2
Field Health and Safety Forms

ATTACHMENT 2
HEALTH AND SAFETY FORMS

Health and Safety Forms

Safety Compliance Agreement Form
Safety Completion Report
Air Monitoring Log
Calibration Log: Direct Reading Monitoring Instrument
Emergency Medical Notification Form
Emergency Response Evaluation Form
Equipment Decontamination Release Authorization
Hazardous Substance Inventory List
Heavy Equipment Inspection Log
Incident Report by Supervisor
Incident Statement by Employee
Incident Statement by Witness
Incident Statement by Subcontractor
Injury and Illness Report
Machinery and Mechanized Equipment Checklist
Occupational Safety & Health Deficiency Log
Property Damage, Loss and General Liability Report
Safety Inspection Report
Safety and Occupational Health Deficiency Tracking Log
Site Control Log EZ / CRZ
Site Orientation Form
Site Safety and Health Plan Change Approval
Site Safety and Health Plan Distribution to Subcontractor
Site Safety and Health Plan Review
Site Safety Tailgate Meeting Form
Site Visitor Log
Trenching and Excavation Competent Person Checklist
Vehicle Accident Report
Tool Box Safety Meeting Record

Safety Compliance Agreement Form

I the undersigned, acknowledge that I have attended the safety meeting, and. I have read and understood this safety plan, and do agree to assertively adhere to the specifications within. I understand that I may be prohibited from continuing work on the project for failing to comply with this Site Safety and Health Plan.

SIGNATURE & NAME	**COMPANY**	**DATE**
_____	_____	_____
( )		
_____	_____	_____
( )		
_____	_____	_____
( )		
_____	_____	_____
( )		
_____	_____	_____
( )		
_____	_____	_____
( )		
_____	_____	_____
( )		
_____	_____	_____
( )		
_____	_____	_____
( )		

Meeting Conducted by: _____

Safety Completion Report

A completed copy of this report is to be placed into the project files within seven days of the completion of site work.

Site Name: _____ **Project: _____**
Project Manager: _____ **SSHO: _____**

Safety Plan:

Was the plan complete? _____
Was the plan appropriate to conditions found onsite? _____
Was more information on the site available but not included? _____
Was the plan clear and understandable? _____

Plan implementation:

What levels of protection were used? **A____** **B____** **C____** **D____**

Field Air Monitoring Results:

	High	Low	Typical
SMWAF, Two Maintenance Sheds Area	_____	_____	_____

Air Monitoring Results: _____
_____
_____

Any Equipment Problems? (Include ID #) _____
_____

Level of General Site Control (Good, Moderate, Poor): _____
Evaluate General Prime and Subcontractor Compliance/Performance:
_____
_____
_____

Comments: _____
_____
_____
_____

Air Monitoring Log

Project Name: _____
Project Location: _____
Page Number: _____
Date: _____
Conducted By: _____

Time	Location	_____ ( )	_____ ( )	_____ ( )

LEGEND:

PID: Photoionization detector
FID: Flame ionization detector
LEL: Lower explosive limit
O_2: Oxygen meter
mg/m^3: milligrams per cubic meter
ppm: parts per million

Revised 05/11

Calibration Log: Direct-Reading Monitoring Instrument

Project Name: ____

Project Location: ____

Date: **Name:**	**Calibration Gas:** **Concentration:**
Initial Reading: **Adjusted Reading:**	**Comments:**
Date: **Name:**	**Calibration Gas:** **Concentration:**
Initial Reading: **Adjusted Reading:**	**Comments:**
Date: **Name:**	**Calibration Gas:** **Concentration:**
Initial Reading: **Adjusted Reading:**	**Comments:**
Date: **Name:**	**Calibration Gas:** **Concentration:**
Initial Reading: **Adjusted Reading:**	**Comments:**
Date: **Name:**	**Calibration Gas:** **Concentration:**
Initial Reading: **Adjusted Reading:**	**Comments:**

Emergency Medical Notification Form

Employee Name: _____

Mailing Address: _____

Home Telephone: _____

EMERGENCY NOTIFICATION INFORMATION

In Case of Emergency Notify:

Name / Relationship / Telephone: _____

Name / Relationship / Telephone: _____

ALLERGIES

List any health-threatening allergies (i.e., medications, food, bee stings):

_____

_____

MEDICATIONS

List current medications that may affect the ability to safely operate equipment/machinery:

_____

_____

_____

OTHER INFORMATION

List any other information that should be known in case of an emergency:

_____

_____

Name (print): _____

Signature / Date: _____

Revised 05/11

Emergency Response Evaluation Form

Date: _____ Project/Site: _____

Description:_____
_____

❑ Emergency ❑ Drill

Evaluation:

Did employees respond properly? ❑ Yes ❑ No

If no,
describe:_____
_____
_____

Was proper response equipment available? ❑ Yes ❑ No

If no,
describe:_____
_____
_____

Was proper response equipment used? ❑ Yes ❑ No

If no,
describe:_____
_____
_____

Was proper communication completed? ❑ Yes ❑ No

If no,
describe:_____
_____
_____

Are revisions required to existing response plans? ❑ Yes ❑ No

If yes,
describe:_____
_____
_____

Additional Comments (if any):

Signature: _____ Title: _____ Date:

Reviewed by: _____ Title: _____ Date:

Equipment Decontamination Release Authorization

Date / Day: _____
Project Name / Location: _____
Equipment Type: _____
Equipment Mfr / Model: _____
Equipment Number: _____

Item	Inspection Description	Clean	Not Clean	N/A
1	Tires / Rims, outside			
2	Tires / Rims, inside			
3	Buckets / Blades			
4	Rippers / Other			
5	Cross-members			
6	Undercarriage			
7	Tracks			
8	Drive carriage			
9	Drip pans			
10	Brush guards			
11	Belly pans			
12	Scraper can interior			
13	Truck beds			
14	Frames			
15	Engine compartment			
16	Cab			

Equipment Use:

Decontamination Description:

I certify that I have inspected the equipment indicated above and have observed that visible material has been removed from the equipment.

_____

Inspected By / Signature / Date

Revised 05/11

Hazardous Substance Inventory

MSDS on File	Product Name	Manufacturer	Location, Container Type, Approx. Vol.

Revised 05/11

Heavy Equipment Inspection Report

Date / Day: _____
Project Name / Location: _____
Equipment Type: _____
Equipment Mfr / Model: _____
Equipment Number: _____

Item	Inspection Description	Good	Need Repair	N/A
1	Tires or tracks			
2	Hydraulic oil and hose condition			
3	Oil leak / lube leak			
4	Cab; mirrors; seat belt; glass			
5	Horn; gauges			
6	Lights			
7	Turn signals			
8	Backup lights and alarm			
9	Brake condition (dynamic, park, etc.)			
10	Fire extinguisher condition			
11	Engine oil			
12	Transmission fluid			
13	Windshield wipers			
14	Coupling devices and connectors			
15	Exhaust system			
16	Blade / Boom / Ripper condition			
17	Frame, ladders, and walkway			
18	Power cable and/or hoist cable			
19	Steering (standard and emergency)			

Defects and Repairs Needed:

Repair Date:

General Safety Condition:

Inspected By:

_____
Signature:

_____

Incident Report by Supervisor

Date of Incident:
Time of Incident:

Project Name:
Project Number:

Client Name:
Client Location:

Specific Location of Incident:

Employees Involved in Incident (if applicable):

Detailed Description of Incident:

Primary Cause of Incident:

Contributing Cause(s) of Incident:

Recommendation for Preventing Such Incidents in the Future:

Supervisor Name (print):
_____

Signature:
_____

Date:
_____

Incident Statement by Employee

Employee Name:
Date of Incident: _____ **Time of Incident:**
Project Name: _____ **Project Number:**
Client Name: _____ **Client Location:**
Specific Location of Incident:
Describe What You Were Doing Just Before the Incident:
Detailed Description of How the Incident Occurred:
Names of Witnesses:
Other Relevant Information:
How Can the Likelihood of this Happening Again Be Reduced:
Employee Name (print): _____ **Signature:** _____ **Date:**

Incident Statement by Witness

Witness Name: **Address:** **Telephone:**
Employer: **Telephone:**
Date of Incident: **Time of Incident:**
Project Name: **Project Number:**
Client: **Location:**
Specific Location of Incident:
DETAILED DESCRIPTION OF INCIDENT BASED ON PERSONAL OBSERVATION
Describe where you were and what you were doing just before the incident:
Describe any injuries:
Describe any property damaged:
Describe what was the apparent nature of the injury and/or damage:
Describe what personnel and/or equipment were involved:
Describe what caused the injury and/or damage:
Describe the sequence of events:
List any observed unsafe acts or conditions:
Names of other witnesses:
Other relevant information:
Witness Name (print): _____ **Signature:** _____ **Date:**

Incident Statement by Subcontractor

Subcontractor Name:
Date of Incident: **Time of Incident:**.
Project Name: **Project Number:**
Client Name: **Client Location:**
Specific Location of Incident:
Describe What You Were Doing Just Before the Incident:
Detailed Description of How the Incident Occurred:
.
Names of Witnesses:
Other Relevant Information:
How Can the Likelihood of this Happening Again Be Reduced:
Employee Name (print): _____ **Signature:** _____ **Date:**

Injury and Illness Report

Injured Employee Name:	**Date / Time of Injury:**
Social Security Number:	**Date of Birth / Age:**
Sex (M / F):	**Date of Hire:**
Job Title:	**Pay Rate:**
Home Address:	**Home Telephone:**
Prime Contractor Home Office:	**Injured on Prime Contractor's Premises: Yes / No**
Client / Location:	**Injured on Client Premises: Yes / No**
Specific Accident Location:	
Nature of Injury:	
Exact Body Part Injured:	
Medical Attention (Circle): None First Aid Paramedics Doctor Hospital ER	
Medical Attention Description:	
Hospital / Doctor Name / Telephone:	
Hospital / Doctor Address:	
Date / Time Injury Reported: **By Whom:**	
Did employee leave work: (Yes / No) **When:**	
Has employee returned to work: (Yes / No) **When:** **Note: Employee must present return to work release from examining physician before return to work)**	
Did employee have a work activity restriction: (Yes / No) **Dates restricted:**	
Did employee miss a regularly scheduled work shift: (Yes / No) **Dates missed:**	
Injury Incident Description:	
What actions have been taken to prevent recurrence:	
Witness Name:	**Telephone:**
Address:	**Statement Attached: Yes / No**
INVESTIGATION AND REVIEW (Report to HSO within 2 days of injury)	
Site Supervisor Name (print) / Signature / Date:	
Project Manager Name (print) / Signature / Date:	
HSM Name (print) / Signature / Date:	
Attached to this report: [ ] Incident Statement by Employee [ ] Incident Report by Supervisor [ ] Incident Statement by Witness [ ] Photographs [ ] Maps/Sketches [ ] Other	

Occupational Safety & Health Deficiency Log

Deficiency and Date Discovered	Person Responsible For Correction	Projected Resolution Date	Date Resolved

PROPERTY DAMAGE, LOSS AND GENERAL LIABILITY REPORT

Project Name: _____
Project No.:
Project Location:
Project Manager / Supervisor:
Date / Time of Damage or Loss:
Description / Identification of damaged or lost property:
Location of damaged or lost property (before loss):
Detailed description of how the damage or loss occurred:
Cause and corrective action recommended to prevent recurrence:
Owner of damaged or lost property / Telephone:
Address:
Employer Name and Address:
Witnesses:
Witness Name / Telephone:
Address:
Employer Name and Address:
Witness Name / Telephone:
Address:
Employer Name and Address:
Repair or Replacement Cost:
Attachments: [ ] Photographs [ ] Police Report [ ] Incident Statement by Witness [ ] Incident Report by Supervisor [ ] Incident Statement by Employee [ ] Injury Report
Supervisor Name (print): _____
Signature: _____
Date:

Revised 05/11

Safety Inspection Report

Client Name: _____
Date / Day: _____
Project Name: _____
Project Number: _____
Project Location: _____
Work Description: _____
_____
Comments / Other: _____
_____

OBSERVATIONS

_____
_____
_____
_____
_____
_____
_____
_____

Safety Conditions Requiring Corrective Action	Corrective Action, Assignment, and Completion Date

Project Manager: _____
Safety Inspector: _____
Distribution: _____

Site Control Log - EZ / CRZ

Date: _____

Project Name: _____

Project Location: _____

Time		Name	Organization
In	**Out**		

Revised 5/11

Site Orientation Form

Health and Safety orientations are required under the Health and Safety Program. This form is to be completed before a new employee commences work on a site. Please complete all sections that are applicable to the worksite activities.

This form must be signed and dated by the individual responsible for the orientation and the new worker who has received the orientation. Once signed, maintain the original copy of the Site Orientation Form as documentation.

SITE NAME	EMPLOYEE NAME	POSITION	DATE OF ORIENTATION

SUPERVISOR/FOREMAN

To Supervisors: Please ensure that all new employees have been oriented and instructed (with demonstration when necessary) on all topics that are applicable for your site. Site orientation items can be found below in checklist form. Blank spaces have been provided so that you may include additional items that are appropriate to your site and your employees' responsibilities.

SITE ORIENTATION

This section to be completed by employee's supervisor

❑ Site Walkthrough	❑ Smoking	❑ Personal Protective Equipment	❑ _____
❑ Supervisor Contact Info	❑ Emergency Contacts	❑ Equipment/Vehicle Inspections	❑ _____
❑ Incident Reporting	❑ Emergency Procedures	❑ Tool Box Meetings	❑ _____
❑ Route to Hospital	❑ Emergency Exits	❑ _____	❑ _____
❑ Bulletin Board	❑ Muster Points	❑ _____	❑ _____
❑ First Aid	❑ Fire Extinguishers	❑ _____	❑ _____
❑ Tool Area	❑ MSDS location	❑ _____	❑ _____
❑ Attendance	❑ Housekeeping	❑ _____	❑ _____

Safe Work Procedures

❑ Excavations	❑ 3 Point Contact
❑ Confined Space	❑ Manual Lifting
❑ Fall Protection	❑ Heat Stress
❑ Lockout	❑ _____
❑ Hoisting and Lifting	❑ _____
❑ Working Alone	❑ _____

Site Orientation Form (cont.)

The following section is to assist Supervisors in identifying the required authorization / training prior to a new employee using any equipment. All equipment orientation and training performed must be recorded and maintained as documentation.

SITE EQUIPMENT AUTHORIZATION AND TRAINING IDENTIFICATION			
Identify all required training			
❑ Confined Space	❑ Excavator	❑ Loader	❑ _____
❑ Fall Protection	❑ Forklift	❑ Light Vehicles	❑ _____
❑ Sampling Equipment	❑ Cranes	❑ Roller	❑ _____
❑ First Aid	❑ Trailer Towing	❑ Compressor	❑ _____
❑ Hand Tools	❑ Power Tools	❑ Paving Machine	❑ _____
❑ Traffic Control	❑ Dump Truck	❑ _____	❑ _____
❑ Backhoe	❑ Hoists / Lifting Devices	❑ _____	❑ _____

Equipment Authorization and Training Is the Responsibility of the Site Supervisor

Supervisor Comments:

_____

_____

❑ N/A Identified Field Partner: _____ Division: _____

The identified field partner is used to ensure an employee is oriented during their exposure to fieldwork. Field partners must ensure a new employee does not attempt to perform tasks they have not been authorized or trained to do so. If this is not necessary, check N/A.

I have been instructed and understand the foregoing information.

Employee Signature: _____ Date: _____

I have instructed the foregoing information with the above employee and believe that he or she has a reasonable understanding of the information.

Orientator's Signature: _____ Date: _____

Supervisor Signature: _____ Date: _____

SITE ORIENTATION MUST BE COMPLETED PRIOR TO COMMENCING WORK

Original Copy to Be Signed and Maintained Onsite as Documentation

Site Safety and Health Plan
Change Approval Form

Project Name: _____
Project Location: _____
Date: _____
Requested By: _____
Approval By: _____
Distribution: _____

DESCRIPTION OF SSHP CHANGE REQUESTED

_____

_____

_____

_____

SUPPORTING DOCUMENTATION FOR SSHP CHANGE
(Describe and list attachments)

_____

_____

_____

_____

SSHP CHANGE APPROVAL

SSHO Name / Signature / Date: _____

SHM Name / Signature / Date: _____

PM Name / Signature / Date: _____

COTR Name / Signature / Date: _____

Site Safety and Health Plan Distribution to Subcontractor

A copy of the Site Safety and Health Plan for the site is being provided to subcontractors who may be affected by activities covered under the scope of this plan. Distribution of the Site Safety and Health Plan to subcontractor firms and their designated contact person is with the understanding that subcontractor personnel involved in this project will review this document, abide by its provisions, and comply with Cal-OSHA, OSHA and other applicable health and safety rules and regulations for work onsite.

Date	Name	Signature	Organization

Site Safety and Health Plan Review

_____

_____

I have reviewed the Site Safety and Health Plan for the above indicated site and understand the hazards and control measures required on this project.

I agree to follow the procedures outlined in this plan and to inform the Project Manager, Project Superintendent, and/or Site Safety Officer should any unsafe condition be noted.

I understand that failure to follow safety regulations can be reason for removal from this project.

Date	Name	Signature	Company

Site Safety Tailgate Meeting Form

Division/ Subsidiary _____ Facility _____

Date _____ Time _____ Job Number _____

Customer _____ Address _____

Specific Location _____

Type of Work _____

Chemicals Used _____

SAFETY TOPICS PRESENTED

Protective Clothing/ Equipment _____

_____

Chemical Hazards _____

_____

Physical Hazards _____

_____

Emergency Procedures _____

AHA Review _____

_____

Hospital/ Clinic _____ Phone ( ) _____ Paramedic Phone ( ) _____

Hospital Address _____

Other _____

_____

Field Staff Comments_____

_____

_____

ATTENDEES

NAME PRINTED	SIGNATURE
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Meeting conducted by:

_____ _____

(Name Printed) (Signature)

Supervisor _____ Manager _____

Revised 5/11

Site Visitor Log

Date: _____

Project Name: _____

Project Location: _____

Time		Name	Organization
In	**Out**		

Revised 5/11

TRENCHING AND EXCAVATION COMPETENT PERSON CHECKLIST				
Contract Name and Number:	Contractor/Subcontractor:			
Government QA Person:	Location:			
Contractor Inspector:	Date:			
Weather (circle one) Dry Raining Previous Rain Freezing				
COMPETENT PERSON INFORMATION		**Yes**	**No**	**N/A**
Competent Persons Name: _____ Length of experience in this occupation: _____ Length of experience with this employer: _____				
Does the designated individual have training in:				
Soil Analysis?				
Use of protective Systems?				
Requirements of Excavation and Trench Safety per 29 CFR 1926.650-652?				
List Training Experience:				
Does the designated individual have knowledge about:				
Soil Analysis? *(Describe types of soils and properties)*				
Use of protective systems? *(What method is being used and how was it determined)*				
Requirements of 29 CFR 1926.650-652?				
Does the designated individual have authority to:				
Take prompt corrective action to eliminate existing and predictable hazards?				
Stop work?				
GENERAL				
When was the last inspection of the excavation conducted?				
Was an inspection done by a competent person and documented prior to the start of work? (25.A.02)				
Were inspections done and documented as needed throughout the work shift?				
WATER CONDITIONS				
Is dewatering equipment being used on the site?				
If yes is the competent person monitoring the equipment and it's proper operation?				
Are employees prevented from working in excavations which has accumulated water? (25.A.06b)				
Has the excavation been subject to water accumulation?				
Has the soil in the trench been adversely affected?				
If yes has the competent person inspected the excavation and taken action?				

TRENCHING AND EXCAVATION COMPETENT PERSON CHECKLIST (cont.)			
GENERAL (con.)	**Yes**	**No**	**N/A**
Were inspections done and documented after rainstorms or other hazard-increasing occurrence?			
Is the excavation deeper than 4 feet?			
Has protection to prevent personnel, vehicles, and equipment from falling into excavations? (25.A.01)			
If excavation is exposed to members of the public is Class I perimeter protection provided? (25.A.01a)			
If excavation does not meet Class I requirements but is routinely exposed to employees and is either deeper then 6 foot or contains impalements hazards, hazardous substances, is Class II perimeter protection provided? (25.B.01b)			
When workers are between the Class II zone warning barricades or flagging are they provided fall protection? (25.B.01b)			
If excavation does not meet Class I or Class II perimeter protection is Class III perimeter protection provided? (25.B.01c)			
Oxygen deficiency or gases conditions tested daily prior to each shift or more often if needed? (25.A.02c)			
EGRESS			
When excavation is over 4 foot in depth has a means of egress been provided every 25 feet of lateral travel? (25.B.05)			
Have at least two means of exit been provided for personnel working in excavations? (25.B.05a)			
If width is exceeds 100 foot has two or more means of exit on each side been provided? 25.B.02a)			
Is a ramp used for access or egress to the excavation? (if no skip to the next section).			
Is the ramp used solely for employee access?			
If yes was it designed by competent person for safe access and egress?			
If yes, is the competent person who designed the ramp qualified?			
Does the ramp meet specifications?			
CONFINED SPACES			
Is there a potential for a hazardous atmosphere in the trench? If not, why?			
Is air monitoring equipment on site?			
Has a qualified person been assigned to assess the hazards of confined space? *(EM-385 APPENDIX Q Definition): A Qualified Person is designated by the employer in writing. "One who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.")* **This person shall be capable of specifying necessary control and/or protective measures to ensure safety.**			
Is emergency rescue equipment as outlined in 29 CFR 1926.651(g)(2)(i) readily accessible to employees?			

_____ _____

Signature of Competent person (contractor) Date

_____

Printed Name of Competent person

Vehicle Accident Report

Prime Contractor's Vehicle	
Date / Time / Location:	
Driver Name:	**Accident Date:**
Drivers License #:	**State:**
Driver Address:	**Project Location:**
Vehicle Year/Make /Model:	
License Plate #:	**State:**
Vehicle Owner (Circle): Owned Leased Rented Private	
Vehicle Owner Address:	**Telephone:**
Vehicle Damage:	**Est. Repair Cost:**
Other Vehicles	
Driver Name / Telephone:	
Drivers License #:	**State**
Drivers Address:	
Vehicle Owner Name / Telephone:	
Vehicle Owner Address:	
Insurance Co. / Telephone:	**Policy #:**
Address:	**Agents Name:**
Vehicle Year / Make / Model:	
License Plate #:	**State:**
Vehicle Damage:	
Passengers (list on back): Yes / No	**Injuries (list on back): Yes / No**
Accident Description	
Sketch Attached: Yes / No	**Photos Attached: Yes / No**
Description:	
Witness Information	
Witness Name:	**Telephone:**
Address:	
Statement Attached: Yes / No	
Police Report	
Police Department:	**Date / Time Reported:**
Telephone:	**Police Report #:**
Police Officer Name:	
Investigation and Review	
Report Prepared By / Date:	
Supervisor Name / Signature / Date:	

Revised 05/11

Tool Box Safety Meeting Record

Job Name / Job Number:	Date / Day:		Print Name	Initial
Job Location:	Time:	1		
Project Manager:	Number Employees:	2		
Site Superintendent:	Number Subcontractors:	3		
Site Safety and Health Officer:	Number Others:	4		
I. SCOPE OF WORK		5		
		6		
		7		
		8		
		9		
II. CHEMICAL HAZARDS		10		

Chemical	Exposure Limit	Health Effects			
			11		
			12		
			13		
			14		
			15		

III. PHYSICAL / BIOLOGICAL HAZARDS	16		
[ ] Fire Protection and Hot Work [ ] Underground/Overhead Lines [ ] Heavy Equipment [ ] Excavation and Trenching [ ] Vehicle and Equipment Traffic [ ] Driver Safety	17		
[ ] Material Handling [ ] Tools, Machinery and Equipment [ ] Electrical Safety and Lockout/Tagout [ ]Noise Exposure [ ] Heat/Cold Stress [ ]Confined Space Entry	18		
[ ] Ladders [ ] Elevated Work Locations and Fall Protection [ ] Drum Handling [ ] Compressed gas cylinders [ ] Vacuum trucks [ ] Pressure Washer [ ] Aerial Lift	19		
[ ] Hoisting and Rigging [ ] Cranes [ ] Aerial Lift [ ] Power saw [ ] Slip/Trip/Fall; Uneven/Sloped/Slippery Ground [ ] Housekeeping [ ] Biological Hazards	20		
[ ] Inclement Weather and Adverse Environmental Conditions [ ] Other:	21		
IV. WORK TASK / PROTECTION LEVEL	22		

Work Task	PPE Description					
	Level C [ ]	Modified-Level D [ ]	Level D [ ]	23		
	Level C [ ]	Modified-Level D [ ]	Level D [ ]	24		
	Level C [ ]	Modified-Level D [ ]	Level D [ ]	25		
	Level C [ ]	Modified-Level D [ ]	Level D [ ]	26		
	Level C [ ]	Modified-Level D [ ]	Level D [ ]	27		

PPE DESCRIPTION: Level D is Hardhat; Safety glasses; S/T boots; Work gloves; Ear plugs. Mod-D is Level D+ protective clothing; Level C is Mod-D + APR	28		
V. ACTIVITY HAZARD ANALYSES REVIEWS			
VI. COMMENTS / SUGGESTIONS			
Meeting Conducted By: **Report Prepared By:**			

ATTACHMENT 3
Accident Reporting Forms

(For Safety Staff only)	REPORT NO.	EROC CODE	**UNITED STATES ARMY CORPS OF ENGINEERS ACCIDENT INVESTIGATION REPORT** *(For Use of this Form See Attached Instructions and USACE Suppl to AR 385-40)*	**REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)**
		G6		

1. ACCIDENT CLASSIFICATION

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT ☐ CIVILIAN ☐ MILITARY	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ CONTRACTOR	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ PUBLIC	☐ FATAL ☐ OTHER		☐	

2. PERSONAL DATA

a. Name *(Last, First, MI)*	b. AGE	c. SEX ☐ MALE ☐ FEMALE	d. SOCIAL SECURITY NUMBER	e. GRADE

f. JOB SERIES/TITLE	g. DUTY STATUS AT TIME OF ACCIDENT	h. EMPLOYMENT STATUS AT TIME OF ACCIDENT
	☐ ON DUTY ☐ TDY ☐ OFF DUTY	☐ ARMY ACTIVE ☐ ARMY RESERVE ☐ VOLUNTEER ☐ PERMANENT ☐ FOREIGN NATIONAL ☐ SEASONAL ☐ TEMPORARY ☐ STUDENT ☐ OTHER *(Specify)*

3. GENERAL INFORMATION

a. DATE OF ACCIDENT *(month/day/year)*	b. TIME OF ACCIDENT *(Military time)*	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR'S NAME
	hrs		(1) PRIME: (2) SUBCONTRACTOR:

e. CONTRACT NUMBER	f. TYPE OF CONTRACT	g. HAZARDOUS/TOXIC WASTE ACTIVITY
☐ CIVIL WORKS ☐ MILITARY ☐ OTHER *(SPECIFY)*	☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER *(SPECIFY)*	☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER *(Specify)*

4. CONSTRUCTION ACTIVITIES ONLY *(Fill in line and corresponding code number in box from list - see instructions)*

a. CONSTRUCTION ACTIVITY	(CODE)	b. TYPE OF CONSTRUCTION EQUIPMENT	(CODE)
	#		#

5. INJURY/ILLNESS INFORMATION *(Include name on line and corresponding code number in box for items e, f & g - see instructions)*

a. SEVERITY OF ILLNESS/INJURY	(CODE)	B. ESTIMATED DAYS LOST	C. ESTIMATED DAYS HOSPITALIZED	D. ESTIMATED DAYS RESTRICTED DUTY
	#			

e. BODY PART AFFECTED	(CODE)	g. TYPE AND SOURCE OF INJURY/ILLNESS	(CODE)
PRIMARY	#	TYPE	#
SECONDARY	#	SOURCE	#
f. NATURE OF ILLNESS / INJURY	#		

6. PUBLIC FATALITY *(Fill in line and correspondence code number in box - see instructions)*

a. ACTIVITY AT TIME OF ACCIDENT	(CODE)	b. PERSONAL FLOATATION DEVICE USED?
	#	☐ YES ☐ NO ☐ N/A

7. MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE	b. TYPE OF COLLISION	c. SEAT BELTS	USED	NOT USED	NOT AVAILABLE
☐☐ PICKUP/VAN ☐☐ AUTOMOBILE ☐☐ TRUCK ☐☐ OTHER *(Specify)*	☐ SIDE SWIPE ☐ HEAD ON ☐ REAR END ☐ BROADSIDE ☐ ROLL OVER ☐ BACKING ☐ OTHER *(Specify)*	(1) FRONT SEAT			
		(2) REAR SEAT			

8. PROPERTY/MATERIAL INVOLVED

a. NAME OF ITEM	B. OWNERSHIP	C. $ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

9. VESSEL/FLOATING PLANT ACCIDENT *(Fill in line and correspondence code number in box from list - see instructions)*

a. TYPE OF VESSEI/FLOATING PLANT	(CODE)	b. TYPE OF COLLISION/MISHAP	(CODE)
	#		#

10. ACCIDENT DESCRIPTION *(Use additional paper, if necessary)*

See attached page.

11. **CAUSAL FACTOR(S)** *(Read Instruction Before Completing)*

a. (Explain YES answers in item 13)	YES	NO
DESIGN: Was design of facility, workplace or equipment a factor?	☐	☐
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUMAN FACTORS: Did any human factors such as, size or strength of person, etc., contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc., contribute to the accident?	☐	☐

a. *(CONTINUED)*	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors or physical agents, such as, noise, radiation, etc., contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc., contribute to the accident?	☐	☐
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQUIPMENT: Did the improper selection, use or maintenance of personal protective equipment contribute to the accident?	☐	☐
DRUGS/ALCOHOL: In your opinion, was drugs or alcohol a factor to the accident	☐	☐

b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?

☐ YES *(If yes, attach a copy.)* ☐ NO

12. **TRAINING**

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?	b. TYPE OF TRAINING.	c. DATE OF MOST RECENT FORMAL TRAINING.
☐ YES ☐ NO	☐ CLASSROOM ☐ ON JOB	(Month) (Day) (Year)

13. **FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT; INCLUDE DIRECT AND INDIRECT CAUSES** *(See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)*

a. DIRECT CAUSE

See attached page.

b. INDIRECT CAUSE(S)

See attached page.

14. **ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S).**

DESCRIBE FULLY:

See attached page.

15. **DATES FOR ACTIONS IDENTIFIED IN BLOCK 14.**

a. BEGINNING (Month/Day/Year)	b. ANTICIPATED COMPLETION (Month/Day/Year)		
c. SIGNATURE AND TITLE OF SUPERVISOR COMPLETING REPORT CORPS _____ CONTRACTOR _____	d. DATE *(Mo/Da/Yr)*	e. ORGANIZATION IDENTIFIER *(Div, Br, Sect)* CENWO-	f. OFFICE SYMBOL

16. **MANAGEMENT REVIEW** *(1st)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

17. **MANAGEMENT REVIEW** *(2nd - Chief Operations, Construction, Engineering, etc.)*

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE
	Chief,	

18. **SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW**

a. ☐ CONCUR b. ☐ NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS

SIGNATURE	TITLE	DATE
	Chief, Division Safety & Occupational Health Office	

19. **COMMAND APPROVAL**

COMMENTS

COMMANDER SIGNATURE	DATE
JEFFREY A. BEDEY Colonel, EN Commanding	

(Reverse of ENG Form 3394)

*U.S. GOVERNMENT PRINTING OFFICE: 1993-0-791-757

10. ACCIDENT DESCRIPTION *(Continuation)*

13a. DIRECT CAUSE *(Continuation)*

13b.	INDIRECT CAUSES *(Continuation)*

14.	ACTION(S) TAKEN, ANTICIPATED, OR RECOMMENDED TO ELIMINATE CAUSE(S) *(Continuation)*

Summary Guide for Completing USACE Contractor Monthly Summary Record of Injuries/Illnesses & Work Hour Exposure

In accordance with the provisions of EM 385-1-1, Section 01 Program Management, Paragraph 01.D Accident Reporting and Recording, sub-paragraphs 01.D.05, you (the Prime Contractor) shall provide a monthly record of all exposure and accident experience incidental to the work (this includes exposure and accident experience of the Prime Contractor and its sub-contractor(s)). At a minimum, these records shall include exposure work hours and a record of occupational injuries and illnesses that include the data elements listed below. Definitional criteria for each data element are found in 29 CFR Part 1904. Most of this information can be obtained from the Contractor's OSHA 300 Log.

If the Contractor injuries/illnesses and/or work hour exposure changes after the record is submitted to USACE, Contractor shall provide a revised report to the GDA. In addition, the contractor must complete the USACE ENG Form 3394, Report of Accident Investigation for all recordable accidents. Definitions for recordable accidents are the same as found in 29 CFR Part 1904 and provided below. This monthly report shall be submitted to the GDA within the time limit and in a manner (electronic, hardcopy) established by the GDA. Unless otherwise specified by the GDA, this form shall be submitted by close of business on the 10th day of the following month.

How do I determine the Standard Industrial Classification (SIC) or North American Industry Classification System (NAICS) code for the prime, sub, and supply contractors?

You determine the SIC code by using the Standard Industrial Classification Manual and the the NAIC code by using the North American Industry Classification System Manual. Both codes are products of the Executive Office of the President, Office of Management and Budget. You may contact your nearest OSHA office or State agency for help in determining your SIC or NAIC code.

Recordable Injuries/Illness which must be included in the Record

Contractor must keep records of fatalities, injuries, and illnesses that are:

- Work related
- New case
- Meet 1 or more of the recording requirements listed below:

    - Death
    - Days away from Work after the date of injury
    - Restricted work or transfer to another job
    - Medical Treatment beyond first aid
    - Loss of consciousness

Needlestick injuries and cuts from sharps that are contaminated with another person's blood or other potentially infectious material.

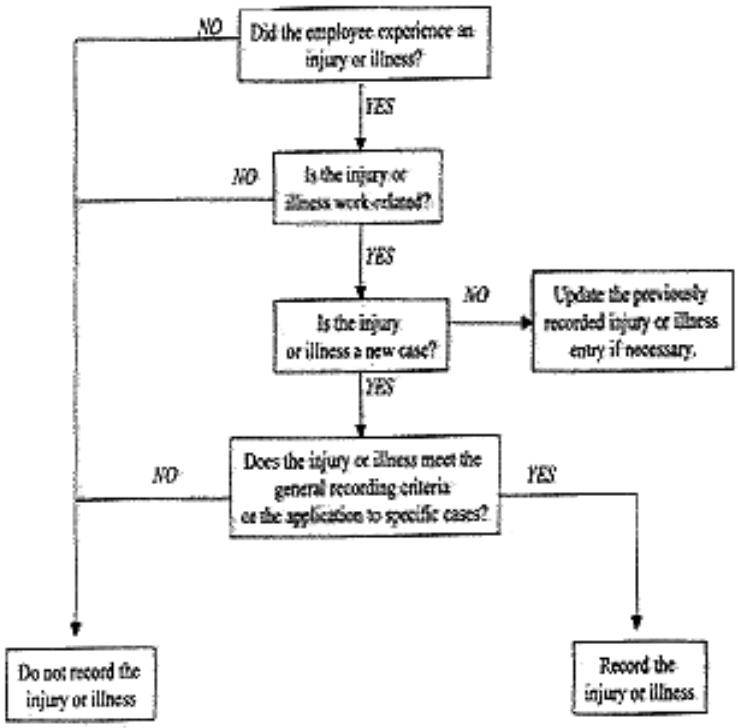
Medical removal under medical surveillance requirements of an OSHA Standard

Occupational hearing loss if the employee has experienced a work-related STS in hearing in one or both ears and the employee's total hearing level is 25 dB or more above audiometric zero in same ear(s) as the STS.

Work-related tuberculosis Cases

How do I decide whether a particular injury or illness is recordable?

The decision tree for recording work-related injuries and illnesses below shows the steps involved in making this determination.



When is an injury/illness considered work-related?

An injury/illness is considered work-related if an event or exposure in the work environment caused or contributed to the condition or significantly aggravated a preexisting condition. Work relatedness is presumed for injuries and illnesses resulting from events or exposures occurring in the workplace, unless an exception specifically applies. See 29 CFR Part 1904.5(b)(2) for exceptions.

Land Based Activities

The work environment for USACE contractors is defined as the physical location of the project site(s).

Marine Activities

For marine activity accident reporting only, the contractor's responsibility for reporting work-related accidents extends to the following personnel and equipment:

1. Prime Contractor and subcontractor personnel and equipment (P&E) performing work in direct support of the contracted activity. This includes:
    a. Contractor P&E that have reported on-station in a contract-defined work area to begin work under project-funded pay or subcontract status.
    b. Contractor P&E at all sites leased or used during contract work for storage, staging, anchorage, transiting, or deposit of materials.
    c. Contractor P&E during mobilization or demobilization under terms of the contract.
2. Service and supply vendors when they come under the direct operational control of a prime or subcontractor vessel master or project superintendent, such as:
    a. When making final approach to make up to Contractor vessels/plant
    b. While their vessels are made up to Contractor vessels, structures, or equipment.
    c. During delivery of materials or on-board a vessel.
    d. When casting off and navigating away from Contractor vessels/plant.

What is medical treatment?

Medical treatment includes managing and caring for a patient for the purpose of combating disease or disorder. The following are not considered medical treatments and are NOT recordable:

Visits to a doctor or health care professional solely for observation or counseling;
Diagnosis procedures, including administering prescription medications that are used solely for diagnostic purposes; and
Any procedure that can be labeled first aid.

What is First Aid?

First aid means only those treatments specifically listed in 1904.7. They are:

Using non-prescription medication at non-prescription strength (for medications available in both prescription and non-prescription form, a recommendation by a physician or other licensed health care professional to use a non-prescription medication at prescription strength is considered medical treatment for recordkeeping purposes);

Administering tetanus immunizations (other immunizations, such as Hepatitis B vaccine or rabies vaccine, are considered medical treatment);

Cleaning, flushing or soaking wounds on the surface of the skin;

Using wound coverings such as bandages, Band-Aids™, gauze pads, etc.; or using butterfly bandages or Steri-Strips™ (other wound closing devices such as sutures, staples, etc., are considered medical treatment);

Using hot or cold therapy;

Using any non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc. (devices with rigid stays or other systems designed to immobilize parts of the body are considered medical treatment for recordkeeping purposes);

Using temporary immobilization devices while transporting an accident victim (*e.g.*, splints, slings, neck collars, back boards, etc.).

Drilling of a fingernail or toenail to relieve pressure, or draining fluid from a blister;

Using eye patches;

Removing foreign bodies from the eye using only irrigation or a cotton swab;

Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means;

Using finger guards;

Using massages (physical therapy or chiropractic treatment are considered medical treatment for recordkeeping purposes); or

Drinking fluids for relief of heat stress.

How do you decide if the case involved restricted work?

Restricted work activity occurs when, as the result of a work-related injury/illness, an employer or health care professional keeps, or recommends keeping, an employee from doing the routine functions of his or her job or from working the full workday that the employee would have been scheduled to work before the injury or illness occurred.

How do you count the number of days of restricted work activity on the number of days away from work?

Count the number of CALENDAR days the employee was on restricted work activity or was away from work as a result of the recordable injury/illness. Do not count the day on which the injury/illness occurred in this number. Begin counting days from the day after the incident occurs. If a single injury/illness involving both days away from work and days of restricted work activity, enter the total number of days for each. You may stop counting days of restricted work activity or days away from work once the total of either or the combination of both reaches 180 days.

What if the outcome changes after the record is submitted to the GDA?

If the outcome or extent of injury/illness changes after the record has been submitted to the GDA, the record should be revised and resubmitted to the GDA on or before the date the subsequent monthly record is to be submitted.

What is an Injury?

An injury is any wound or damage to the body resulting from an event in the work environment.

Examples: Cuts, puncture, laceration, abrasion, fracture, bruise, contusion, chipped tooth, amputation, insect bite, electrocution, or a thermal, chemical, electrical, or radiation burn. Sprain and strain injuries to muscles, joints, and connective tissues are classified as injuries when they result from a slip, trip, fall or other similar accidents.

What is an Illness?

Skin diseases or disorders

Skin diseases or disorders are illnesses involving the worker's skin that are caused by work exposure to chemicals, plants, or other substances.

Examples: Contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants; oil acne; fraction blisters, chrome ulcers; inflammation of the skin.

Respiratory conditions

Respiratory conditions are illnesses associated with breathing hazardous biological agents, chemicals, dust, gases, vapors, or fumes at work.

Examples: Silicosis, asbestosis, pneumonitis, pharyngitis, rhinitis, or acute congestion; farmer's lung, beryllium disease, tuberculosis, occupational asthma, reactive airways dysfunction syndrome (RADS), chronic obstructive pulmonary disease (COPD), hypersensitivity pneumonitis, toxic inhalation injury, such as metal fume fever, chronic obstructive bronchitis, and other pneumoconiosis.

Poisoning

Poisoning includes disorders evidenced by abnormal concentrations of toxic substances in blood, other tissues, other bodily fluids, or the breath that are caused by the ingestion or absorption of toxic substances into the body.

Examples: Poisoning by lead, mercury, cadmium, arsenic, or other metals; poisoning by carbon monoxide, hydrogen sulfide, or other gases; poisoning by benzene, benzol, carbon tetrachloride, or other organic solvents; poisoning by insecticide sprays, such as parathion or lead arsenate; poisoning by other chemicals, such as formaldehyde.

Hearing loss

Noise-induced hearing loss is defined for recordkeeping purposes as a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more in either ear at 2,000, 3,000, and 4,000 hertz, and the employee's totally hearing level is 25 decibels (dB) or more above audiometric zero (also averaged at 2,000, 3,000, and 4,000 hertz) in the same ear(s).

All other illnesses

All other occupational illnesses.

Examples: Heatstroke, sunstroke, heat exhaustion, heat stress and other effects of environmental heat; freezing, frostbite, and other effects of exposure to low temperatures; decompression sickness; effects of ionizing radiation (isotopes, x-rays, radium); effects of nonionizing radiation (welding flash, ultra-violet rays, lasers); anthrax; bloodborne pathogenic diseases, such as AIDS, HIV, hepatitis B or hepatitis C; brucellosis; malignant or benign tumors; histoplasmosis; coccidioidomycosis.

How do you determine the total hours worked by all employees?

Land Based Activities

Include hours prime and sub-contractor employees worked on the project work site by salaried, hourly, part-time, and seasonal workers, as well as hours worked by other workers subject to the day-to-day supervision by prime and sub-contractor employees (example: temporary help services workers). Also include the hours worked by supply contractor employees associated with materials, services, or equipment provided by suppliers (example: concrete supply drivers and helpers delivering concrete for placement on the work site, dump truck drivers while on site delivering or removing materials, other supply contractor employees who are performing an on-site service) while on the project work site.

Marine Activities

For marine activity reporting only, the contractor's responsibility for reporting work-related hours of exposure extends to the following personnel and equipment:

1. Prime Contractor and subcontractor personnel and equipment (P&E) performing work in direct support of the contracted activity. This includes:
    a. Contractor P&E that have reported on-station in a contract-defined work area to begin work under project-funded pay or subcontract status.
    b. Contractor P&E at all sites leased or used during contract work for storage, staging, anchorage, transiting, or deposit of materials.
    c. Contractor P&E during mobilization or demobilization under terms of the contract.

2. Service and supply vendors when they come under the direct operational control of a prime or subcontractor vessel master or project superintendent, such as:

a. When making final approach to make up to Contractor vessels/plant.
b. While their vessels are made up to Contractor vessels, structures, or equipment.
c. During delivery of materials or on-board a vessel.
d. When casting off and navigating away from Contractor vessels/plant.

Do not include vacation, sick leave, holidays, or any other non-work time, even if employees were paid for it. If the contractor keeps records of only hours paid or if the contractor has employees who are not paid by the hour (salaried employees), estimate the hours that the employees actually worked on the project.

If this number isn't available, you can use this optional worksheet to estimate it.

Optional Worksheet

_____	**Find** the number of all prime and sub-contractor full-time employees on the project site as defined above for both land based and marine activities for the month.
X_____	**Multiply** by the number of work hours for a full-time employee in a month.
_____	This is the number of full-time hours worked.
+_____	**Add** the number of any overtime hours as well as the hours worked by other employees (part-time, temporary, seasonal, supply contractors, etc.)
_____	**Round** the answer to the next highest whole number. Write the rounded number in the Monthly Exposure Hours blank.

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

Summary of Work-Related Injuries and Illnesses

Year _____

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

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(K)	(L)

Injury and Illness Types

Total number of…	(M)		
(1) Injury	0	(4) Poisoning	0
(2) Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Establishment information

Your establishment name _____

Street _____

City _____ State _____ Zip _____

Industry description (e.g., Manufacture of motor truck trailers)

_____

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

____ ____ ____ ____

OR North American Industrial Classification (NAICS), if known (e.g., 336212)

____ ____ ____ ____ ____ ____

Employment information

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____
Company executive Title

_____ _____
Phone Date

OSHA
Forms for Recording
Work-Related Injuries and Illnesses

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

Dear Employer:

This booklet includes the forms needed for maintaining occupational injury and illness records for 2004. These new forms have changed in several important ways from the 2003 recordkeeping forms.

In the December 17, 2002 Federal Register (67 FR 77165-77170), OSHA announced its decision to add an occupational hearing loss column to OSHA's Form 300, Log of Work-Related Injuries and Illnesses. This forms package contains modified Forms 300 and 300A which incorporate the additional column M(5) Hearing Loss. Employers required to complete the injury and illness forms must begin to use these forms on January 1, 2004.

In response to public suggestions, OSHA also has made several changes to the forms package to make the recordkeeping materials clearer and easier to use:

- On Form 300, we've switched the positions of the day count columns. The days "away from work" column now comes before the days "on job transfer or restriction."
- We've clarified the formulas for calculating incidence rates.
- We've added new recording criteria for occupational hearing loss to the "Overview" section.
- On Form 300, we've made the column heading "Classify the Case" more prominent to make it clear that employers should mark only one selection among the four columns offered.

The Occupational Safety and Health Administration shares with you the goal of preventing injuries and illnesses in our nation's workplaces. Accurate injury and illness records will help us achieve that goal.

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

What's Inside...

In this package, you'll find everything you need to complete OSHA's *Log* and the *Summary of Work-Related Injuries and Illnesses* for the next several years. On the following pages, you'll find:

- ***An Overview: Recording Work-Related Injuries and Illnesses —*** General instructions for filling out the forms in this package and definitions of terms you should use when you classify your cases as injuries or illnesses.

- ***How to Fill Out the Log —*** An example to guide you in filling out the *Log* properly.

- ***Log of Work-Related Injuries and Illnesses —*** Several pages of the *Log* (but you may make as many copies of the *Log* as you need.) Notice that the *Log* is separate from the *Summary*.

- ***Summary of Work-Related Injuries and Illnesses —*** Removable *Summary* pages for easy posting at the end of the year. Note that you post the *Summary* only, not the *Log*.

- ***Worksheet to Help You Fill Out the Summary —*** A worksheet for figuring the average number of employees who worked for your establishment and the total number of hours worked.

- ***OSHA's 301: Injury and Illness Incident Report —*** A copy of the OSHA 301 to provide details about the incident. You may make as many copies as you need or use an equivalent form.

Take a few minutes to review this package. If you have any questions, ***visit us online at www.osha. gov*** **or** ***call your local OSHA office.*** We'll be happy to help you.

An Overview: Recording Work-Related Injuries and Illnesses

The Occupational Safety and Health (OSH) Act of 1970 requires certain employers to prepare and maintain records of work-related injuries and illnesses. Use these definitions when you classify cases on the Log. OSHA's recordkeeping regulation (see 29 CFR Part 1904) provides more information about the definitions below.

The *Log of Work-Related Injuries and Illnesses* (Form 300) is used to classify work-related injuries and illnesses and to note the extent and severity of each case. When an incident occurs, use the *Log* to record specific details about what happened and how it happened. The *Summary* — a separate form (Form 300A) — shows the totals for the year in each category. At the end of the year, post the *Summary* in a visible location so that your employees are aware of the injuries and illnesses occurring in their workplace.

Employers must keep a *Log* for each establishment or site. If you have more than one establishment, you must keep a separate *Log* and *Summary* for each physical location that is expected to be in operation for one year or longer.

Note that your employees have the right to review your injury and illness records. For more information, see 29 Code of Federal Regulations Part 1904.35, *Employee Involvement*.

Cases listed on the *Log of Work-Related Injuries and Illnesses* are not necessarily eligible for workers' compensation or other insurance benefits. Listing a case on the *Log* does not mean that the employer or worker was at fault or that an OSHA standard was violated.

When is an injury or illness considered work-related?

An injury or illness is considered work-related if an event or exposure in the work environment caused or contributed to the condition or significantly aggravated a preexisting condition. Work-relatedness is presumed for injuries and illnesses resulting from events or exposures occurring in the workplace, unless an exception specifically applies. See 29 CFR Part 1904.5(b)(2) for the exceptions. The work environment includes the establishment and other locations where one or more employees are working or are present as a condition of their employment. See 29 CFR Part 1904.5(b)(1).

Which work-related injuries and illnesses should you record?

Record those work-related injuries and illnesses that result in:

- death,
- loss of consciousness,
- days away from work,
- restricted work activity or job transfer, or
- medical treatment beyond first aid.

You must also record work-related injuries and illnesses that are significant (as defined below) or meet any of the additional criteria listed below.

You must record any significant work-related injury or illness that is diagnosed by a physician or other licensed health care professional. You must record any work-related case involving cancer, chronic irreversible disease, a fractured or cracked bone, or a punctured eardrum. See 29 CFR 1904.7.

What are the additional criteria?

You must record the following conditions when they are work-related:

- any needlestick injury or cut from a sharp object that is contaminated with another person's blood or other potentially infectious material;
- any case requiring an employee to be medically removed under the requirements of an OSHA health standard;
- tuberculosis infection as evidenced by a positive skin test or diagnosis by a physician or other licensed health care professional after exposure to a known case of active tuberculosis.
- an employee's hearing test (audiogram) reveals 1) that the employee has experienced a Standard Threshold Shift (STS) in hearing in one or both ears (averaged at 2000, 3000, and 4000 Hz) and 2) the employee's total hearing level is 25 decibels (dB) or more above audiometric zero (also averaged at 2000, 3000, and 4000 Hz) in the same ear(s) as the STS.

What is medical treatment?

Medical treatment includes managing and caring for a patient for the purpose of combating disease or disorder. The following are not considered medical treatments and are NOT recordable:

- visits to a doctor or health care professional solely for observation or counseling;

What do you need to do?

1. Within 7 calendar days after you receive information about a case, decide if the case is recordable under the OSHA recordkeeping requirements.
2. Determine whether the incident is a new case or a recurrence of an existing one.
3. Establish whether the case was work-related.
4. If the case is recordable, decide which form you will fill out as the injury and illness incident report.

   You may use *OSHA's 301: Injury and Illness Incident Report* or an equivalent form. Some state workers compensation, insurance, or other reports may be acceptable substitutes, as long as they provide the same information as the OSHA 301.

How to work with the Log

1. Identify the employee involved unless it is a privacy concern case as described below.
2. Identify when and where the case occurred.
3. Describe the case, as specifically as you can.
4. Classify the seriousness of the case by recording the **most serious outcome** associated with the case, with column G (Death) being the most serious and column J (Other recordable cases) being the least serious.
5. Identify whether the case is an injury or illness. If the case is an injury, check the injury category. If the case is an illness, check the appropriate illness category.

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

- diagnostic procedures, including administering prescription medications that are used solely for diagnostic purposes; and
- any procedure that can be labeled first aid. (*See below for more information about first aid.*)

What is first aid?

If the incident required only the following types of treatment, consider it first aid. Do NOT record the case if it involves only:

- using non-prescription medications at non-prescription strength;
- administering tetanus immunizations;
- cleaning, flushing, or soaking wounds on the skin surface;
- using wound coverings, such as bandages, BandAids™, gauze pads, etc., or using SteriStrips™ or butterfly bandages.
- using hot or cold therapy;
- using any totally non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc.;
- using temporary immobilization devices while transporting an accident victim (splints, slings, neck collars, or back boards).
- drilling a fingernail or toenail to relieve pressure, or draining fluids from blisters;
- using eye patches;
- using simple irrigation or a cotton swab to remove foreign bodies not embedded in or adhered to the eye;
- using irrigation, tweezers, cotton swab or other simple means to remove splinters or foreign material from areas other than the eye;
- using finger guards;
- using massages;
- drinking fluids to relieve heat stress

How do you decide if the case involved restricted work?

Restricted work activity occurs when, as the result of a work-related injury or illness, an employer or health care professional keeps, or recommends keeping, an employee from doing the routine functions of his or her job or from working the full workday that the employee would have been scheduled to work before the injury or illness occurred.

How do you count the number of days of restricted work activity or the number of days away from work?

Count the number of calendar days the employee was on restricted work activity or was away from work as a result of the recordable injury or illness. Do not count the day on which the injury or illness occurred in this number. Begin counting days from the day after the incident occurs. If a single injury or illness involved both days away from work and days of restricted work activity, enter the total number of days for each. You may stop counting days of restricted work activity or days away from work once the total of either or the combination of both reaches 180 days.

Under what circumstances should you NOT enter the employee's name on the OSHA Form 300?

You must consider the following types of injuries or illnesses to be privacy concern cases:

- an injury or illness to an intimate body part or to the reproductive system,
- an injury or illness resulting from a sexual assault,
- a mental illness,
- a case of HIV infection, hepatitis, or tuberculosis,
- a needlestick injury or cut from a sharp object that is contaminated with blood or other potentially infectious material (see 29 CFR Part 1904.8 for definition), and
- other illnesses, if the employee independently and voluntarily requests that his or her name not be entered on the log.

You must not enter the employee's name on the OSHA 300 *Log* for these cases. Instead, enter "privacy case" in the space normally used for the employee's name. You must keep a separate, confidential list of the case numbers and employee names for the establishment's privacy concern cases so that you can update the cases and provide information to the government if asked to do so.

If you have a reasonable basis to believe that information describing the privacy concern case may be personally identifiable even though the employee's name has been omitted, you may use discretion in describing the injury or illness on both the OSHA 300 and 301 forms. You must enter enough information to identify the cause of the incident and the general severity of the injury or illness, but you do not need to include details of an intimate or private nature.

What if the outcome changes after you record the case?

If the outcome or extent of an injury or illness changes after you have recorded the case, simply draw a line through the original entry or, if you wish, delete or white-out the original entry. Then write the new entry where it belongs. Remember, you need to record the most serious outcome for each case.

Classifying injuries

An injury is any wound or damage to the body resulting from an event in the work environment.

Examples: Cut, puncture, laceration, abrasion, fracture, bruise, contusion, chipped tooth, amputation, insect bite, electrocution, or a thermal, chemical, electrical, or radiation burn. Sprain and strain injuries to muscles, joints, and connective tissues are classified as injuries when they result from a slip, trip, fall or other similar accidents.

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

Classifying illnesses

Skin diseases or disorders

Skin diseases or disorders are illnesses involving the worker's skin that are caused by work exposure to chemicals, plants, or other substances.

Examples: Contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants; oil acne; friction blisters, chrome ulcers; inflammation of the skin.

Respiratory conditions

Respiratory conditions are illnesses associated with breathing hazardous biological agents, chemicals, dust, gases, vapors, or fumes at work.

Examples: Silicosis, asbestosis, pneumonitis, pharyngitis, rhinitis or acute congestion; farmer's lung, beryllium disease, tuberculosis, occupational asthma, reactive airways dysfunction syndrome (RADS), chronic obstructive pulmonary disease (COPD), hypersensitivity pneumonitis, toxic inhalation injury, such as metal fume fever, chronic obstructive bronchitis, and other pneumoconioses.

Poisoning

Poisoning includes disorders evidenced by abnormal concentrations of toxic substances in blood, other tissues, other bodily fluids, or the breath that are caused by the ingestion or absorption of toxic substances into the body.

Examples: Poisoning by lead, mercury, cadmium, arsenic, or other metals; poisoning by carbon monoxide, hydrogen sulfide, or other gases; poisoning by benzene, benzol, carbon tetrachloride, or other organic solvents; poisoning by insecticide sprays, such as parathion or lead arsenate; poisoning by other chemicals, such as formaldehyde.

Hearing Loss

Noise-induced hearing loss is defined for recordkeeping purposes as a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more in either ear at 2000, 3000 and 4000 hertz, and the employee's total hearing level is 25 decibels (dB) or more above audiometric zero (also averaged at 2000, 3000, and 4000 hertz) in the same ear(s).

All other illnesses

All other occupational illnesses.

Examples: Heatstroke, sunstroke, heat exhaustion, heat stress and other effects of environmental heat; freezing, frostbite, and other effects of exposure to low temperatures; decompression sickness; effects of ionizing radiation (isotopes, x-rays, radium); effects of nonionizing radiation (welding flash, ultra-violet rays, lasers); anthrax; bloodborne pathogenic diseases, such as AIDS, HIV, hepatitis B or hepatitis C; brucellosis; malignant or benign tumors; histoplasmosis; coccidioidomycosis.

When must you post the Summary?

You must post the *Summary* only — not the *Log* — by February 1 of the year following the year covered by the form and keep it posted until April 30 of that year.

How long must you keep the Log and Summary on file?

You must keep the *Log* and *Summary* for 5 years following the year to which they pertain.

Do you have to send these forms to OSHA at the end of the year?

No. You do not have to send the completed forms to OSHA unless specifically asked to do so.

How can we help you?

If you have a question about how to fill out the *Log*,

- ❑ ***visit us online at www.osha.gov*** or
- ❑ ***call your local OSHA office.***

Optional

Calculating Injury and Illness Incidence Rates

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

What is an incidence rate?

An incidence rate is the number of recordable injuries and illnesses occurring among a given number of full-time workers (usually 100 full-time workers) over a given period of time (usually one year). To evaluate your firm's injury and illness experience over time or to compare your firm's experience with that of your industry as a whole, you need to compute your incidence rate. Because a specific number of workers and a specific period of time are involved, these rates can help you identify problems in your workplace and/or progress you may have made in preventing work-related injuries and illnesses.

How do you calculate an incidence rate?

You can compute an occupational injury and illness incidence rate for all recordable cases or for cases that involved days away from work for your firm quickly and easily. The formula requires that you follow instructions in paragraph (a) below for the total recordable cases or those in paragraph (b) for cases that involved days away from work, *and* for both rates the instructions in paragraph (c).

(a) *To find out the total number of recordable injuries and illnesses that occurred during the year,* count the number of line entries on your OSHA Form 300, or refer to the OSHA Form 300A and sum the entries for columns (G), (H), (I), and (J).

(b) *To find out the number of injuries and illnesses that involved days away from work,* count the number of line entries on your OSHA Form 300 that received a check mark in column (H), or refer to the entry for column (H) on the OSHA Form 300A.

(c) *The number of hours all employees actually worked during the year*. Refer to OSHA Form 300A and optional worksheet to calculate this number.

You can compute the incidence rate for all recordable cases of injuries and illnesses using the following formula:

Total number of injuries and illnesses x *200,000* ÷ *Number of hours worked by all employees* = *Total recordable case rate*

(The 200,000 figure in the formula represents the number of hours 100 employees working 40 hours per week, 50 weeks per year would work, and provides the standard base for calculating incidence rates.)

You can compute the incidence rate for recordable cases involving days away from work, days of restricted work activity or job transfer (DART) using the following formula:

(Number of entries in column H + Number of entries in column I) x *200,000* ÷ *Number of hours worked by all employees* = *DART incidence rate*

You can use the same formula to calculate incidence rates for other variables such as cases involving restricted work activity (column (I) on Form 300A), cases involving skin disorders (column (M-2) on Form 300A), etc. Just substitute the appropriate total for these cases, from Form 300A, into the formula in place of the total number of injuries and illnesses.

What can I compare my incidence rate to?

The Bureau of Labor Statistics (BLS) conducts a survey of occupational injuries and illnesses each year and publishes incidence rate data by various classifications (e.g., by industry, by employer size, etc.). You can obtain these published data at www.bls.gov/iif or by calling a BLS Regional Office.

Worksheet

Total number of injuries and illnesses			Number of hours worked by all employees		Total recordable case rate
	X 200,000	÷		=	

Number of entries in Column H + Column I			Number of hours worked by all employees		DART incidence rate
	X 200,000	÷		=	

How to Fill Out the Log

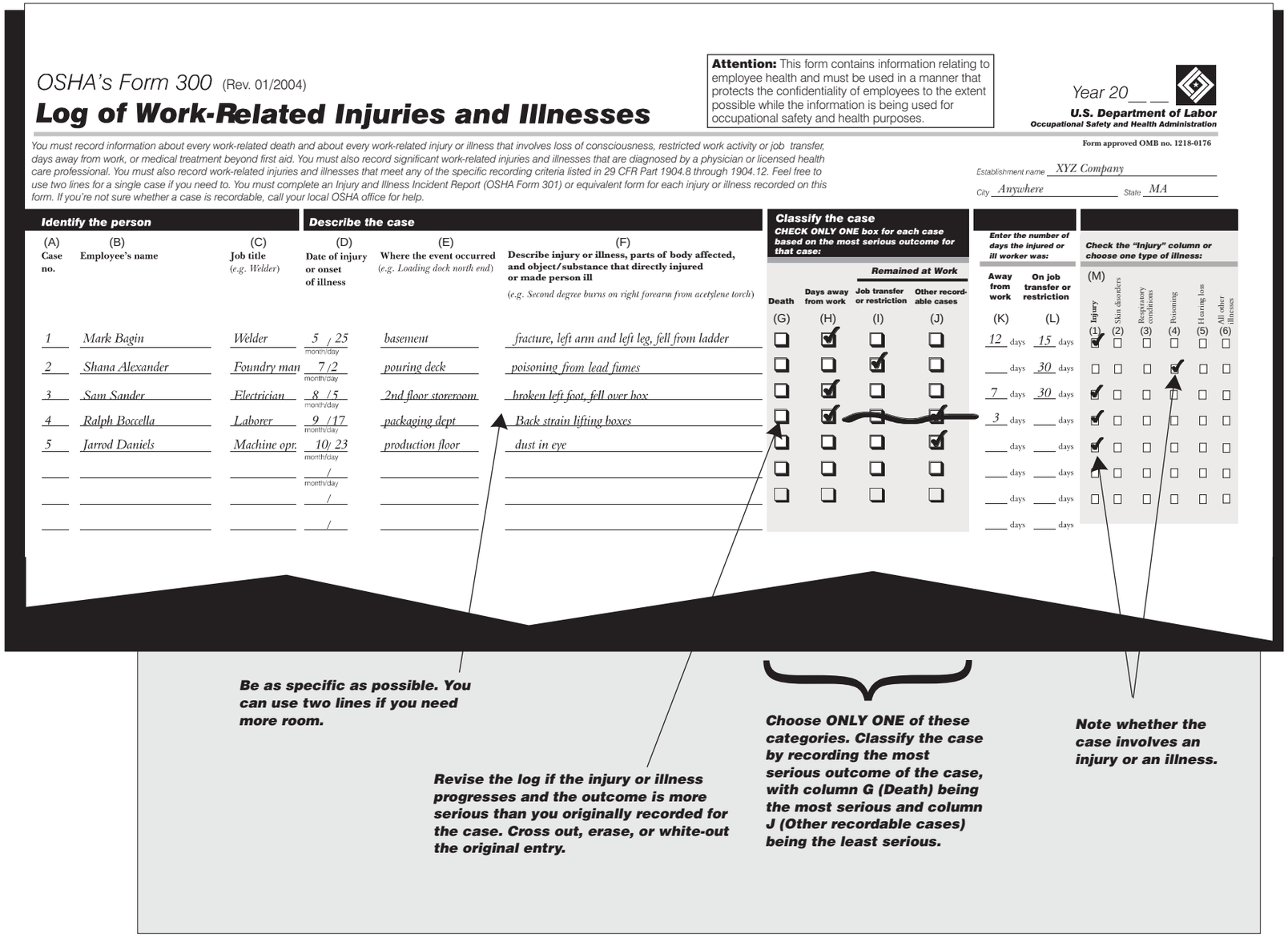
The *Log of Work-Related Injuries and Illnesses* is used to classify work-related injuries and illnesses and to note the extent and severity of each case. When an incident occurs, use the *Log* to record specific details about what happened and how it happened.

If your company has more than one establishment or site, you must keep separate records for each physical location that is expected to remain in operation for one year or longer.

We have given you several copies of the *Log* in this package. If you need more than we provided, you may photocopy and use as many as you need.

The *Summary* — a separate form — shows the work-related injury and illness totals for the year in each category. At the end of the year, count the number of incidents in each category and transfer the totals from the *Log* to the *Summary*. Then post the *Summary* in a visible location so that your employees are aware of injuries and illnesses occurring in their workplace.

You don't post the Log. You post only the Summary at the end of the year.



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 20__ __

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

Form approved OMB no. 1218-0176

You must record information about every work-related death and 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 Part 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.

Establishment name: XYZ Company
City: Anywhere State: MA

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:					
							Remained at Work					(M)					
(A) Case no.	(B) Employee's name	(C) Job title (e.g. Welder)	(D) Date of injury or onset of illness	(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 (G)	Days away from work (H)	Job transfer or restriction (I)	Other recordable cases (J)	Away from work (K)	On job transfer or restriction (L)	Injury (1)	Skin disorders (2)	Respiratory conditions (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)
1	Mark Bagin	Welder	5/25	basement	fracture, left arm and left leg, fell from ladder	☐	☑	☐	☐	12 days	15 days	☑	☐	☐	☐	☐	☐
2	Shana Alexander	Foundry man	7/2	pouring deck	poisoning from lead fumes	☐	☐	☑	☐	___ days	30 days	☐	☐	☐	☑	☐	☐
3	Sam Sander	Electrician	8/5	2nd floor storeroom	broken left foot, fell over box	☐	☑	☐	☐	7 days	30 days	☑	☐	☐	☐	☐	☐
4	Ralph Boccella	Laborer	9/17	packaging dept	Back strain lifting boxes	☐	☑	☐	☐	3 days	___ days	☑	☐	☐	☐	☐	☐
5	Jarrod Daniels	Machine opr.	10/23	production floor	dust in eye	☐	☐	☐	☑	___ days	___ days	☑	☐	☐	☐	☐	☐
			/			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/			☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
			/			☐	☐	☐	☐	___ days	___ days						

Be as specific as possible. You can use two lines if you need more room.

Revise the log if the injury or illness progresses and the outcome is more serious than you originally recorded for the case. Cross out, erase, or white-out the original entry.

Choose ONLY ONE of these categories. Classify the case by recording the most serious outcome of the case, with column G (Death) being the most serious and column J (Other recordable cases) being the least serious.

Note whether the case involves an injury or an illness.

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 20__ __

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

Form approved OMB no. 1218-0176

You must record information about every work-related death and 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 Part 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.

Establishment name ______________________

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: (M)					
								Remained at Work									
(A) Case no.	(B) Employee's name	(C) Job title (e.g., Welder)	(D) Date of injury or onset of illness	(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 (G)	Days away from work (H)	Job transfer or restriction (I)	Other record-able cases (J)	Away from work (K)	On job transfer or restriction (L)	Injury (1)	Skin disorder (2)	Respiratory condition (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
____	____	____	___/___ month/day	____	____	☐	☐	☐	☐	___ days	___ days	☐	☐	☐	☐	☐	☐
					Page totals ➤	____	____	____	____	____	____	____ Injury (1)	____ Skin disorder (2)	____ Respiratory condition (3)	____ Poisoning (4)	____ Hearing loss (5)	____ All other illnesses (6)

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

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

Summary of Work-Related Injuries and Illnesses

Year 20__ __

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

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
_____	_____	_____	_____
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
_____	_____
(K)	(L)

Injury and Illness Types

Total number of . . .

(M)

(1) Injuries _____

(2) Skin disorders _____

(3) Respiratory conditions _____

(4) Poisonings _____

(5) Hearing loss _____

(6) All other illnesses _____

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Establishment information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (*e.g., Manufacture of motor truck trailers*)

_____

Standard Industrial Classification (SIC), if known (*e.g., 3715*)

____ ____ ____ ____

OR

North American Industrial Classification (NAICS), if known (e.g., 336212)

____ ____ ____ ____ ____ ____

Employment information *(If you don't have these figures, see the Worksheet on the back of this page to estimate.)*

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____
Company executive Title

( ) - / /
Phone Date

Optional

Worksheet to Help You Fill Out the Summary

At the end of the year, OSHA requires you to enter the average number of employees and the total hours worked by your employees on the summary. If you don't have these figures, you can use the information on this page to estimate the numbers you will need to enter on the Summary page at the end of the year.

How to figure the average number of employees who worked for your establishment during the year:

❶ ***Add*** the total number of employees your establishment paid in all pay periods during the year. Include all employees: full-time, part-time, temporary, seasonal, salaried, and hourly.

The number of employees paid in all pay periods = ❶ _____

❷ ***Count*** the number of pay periods your establishment had during the year. Be sure to include any pay periods when you had no employees.

The number of pay periods during the year = ❷ _____

❸ ***Divide*** the number of employees by the number of pay periods.

❶ / ❷ _____ = ❸ _____

❹ ***Round the answer*** to the next highest whole number. Write the rounded number in the blank marked *Annual average number of employees*.

The number rounded = ❹ _____

For example, Acme Construction figured its average employment this way:

For pay period...	Acme paid this number of employees...
1	10
2	0
3	15
4	30
5	40
▼	▼
24	20
25	15
26	+10
	830

Number of employees paid = 830 ❶

Number of pay periods = 26 ❷

830 / 26 = 31.92 ❸

31.92 rounds to 32 ❹

32 is the annual average number of employees

How to figure the total hours worked by all employees:

Include hours worked by salaried, hourly, part-time and seasonal workers, as well as hours worked by other workers subject to day to day supervision by your establishment (e.g., temporary help services workers).

Do not include vacation, sick leave, holidays, or any other non-work time, even if employees were paid for it. If your establishment keeps records of only the hours paid or if you have employees who are not paid by the hour, please estimate the hours that the employees actually worked.

If this number isn't available, you can use this optional worksheet to estimate it.

Optional Worksheet

_____ ***Find*** the number of full-time employees in your establishment for the year.

X _____ ***Multiply*** by the number of work hours for a full-time employee in a year.

_____ This is the number of full-time hours worked.

\+ _____ ***Add*** the number of any overtime hours as well as the hours worked by other employees (part-time, temporary, seasonal)

_____ ***Round*** the answer to the next highest whole number. Write the rounded number in the blank marked *Total hours worked by all employees last year.*

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

OSHA's Form 301
Injury and Illness Incident Report

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.

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

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary,* these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (_____)_____--_____ **Date** ____/ ____/ ____

Information about the employee

1) **Full name** _____

2) **Street** _____

City _____ **State** _____ **ZIP** _____

3) **Date of birth** _____ / _____ / _____

4) **Date hired** _____ / _____ / _____

5) ❒ **Male**
❒ **Female**

Information about the physician or other health care professional

6) **Name of physician or other health care professional** _____

_____

7) **If treatment was given away from the worksite, where was it given?**

Facility _____

Street _____

City _____ **State** _____ **ZIP** _____

8) **Was employee treated in an emergency room?**
❒ **Yes**
❒ **No**

9) **Was employee hospitalized overnight as an in-patient?**
❒ **Yes**
❒ **No**

Information about the case

10) **Case number from the *Log*** _____ *(Transfer the case number from the Log after you record the case.)*

11) **Date of injury or illness** _____ / _____ / _____

12) **Time employee began work** _____ **AM / PM**

13) **Time of event** _____ **AM / PM** ☐ **Check if time cannot be determined**

14) ***What was the employee doing just before the incident occurred?*** **Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific.** ***Examples:*** **"climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."**

15) ***What happened?*** **Tell us how the injury occurred.** ***Examples:*** **"When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."**

16) ***What was the injury or illness?*** **Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or sore."** ***Examples:*** **"strained back"; "chemical burn, hand"; "carpal tunnel syndrome."**

17) ***What object or substance directly harmed the employee?*** ***Examples:*** **"concrete floor"; "chlorine"; "radial arm saw."** ***If this question does not apply to the incident, leave it blank.***

18) ***If the employee died, when did death occur?*** **Date of death** _____ / _____ / _____

If You Need Help...

If you need help deciding whether a case is recordable, or if you have questions about the information in this package, feel free to contact us. We'll gladly answer any questions you have.

- **Visit us online at www.osha.gov**
- **Call your OSHA Regional office and ask for the recordkeeping coordinator**

  or

- **Call your State Plan office**

Federal Jurisdiction

Region 1 - 617 / 565-9860
Connecticut; Massachusetts; Maine; New Hampshire; Rhode Island

Region 2 - 212 / 337-2378
New York; New Jersey

Region 3 - 215 / 861-4900
DC; Delaware; Pennsylvania; West Virginia

Region 4 - 404 / 562-2300
Alabama; Florida; Georgia; Mississippi

Region 5 - 312 / 353-2220
Illinois; Ohio; Wisconsin

Region 6 - 214 / 767-4731
Arkansas; Louisiana; Oklahoma; Texas

Region 7 - 816 / 426-5861
Kansas; Missouri; Nebraska

Region 8 - 303 / 844-1600
Colorado; Montana; North Dakota; South Dakota

Region 9 - 415 / 975-4310

Region 10 - 206 / 553-5930
Idaho

State Plan States

Alaska - 907 / 269-4957

Arizona - 602 / 542-5795

California - 415 / 703-5100

*Connecticut - 860 / 566-4380

Hawaii - 808 / 586-9100

Indiana - 317 / 232-2688

Iowa - 515 / 281-3661

Kentucky - 502 / 564-3070

Maryland - 410 / 767-2371

Michigan - 517 / 322-1848

Minnesota - 651 / 284-5050

Nevada - 702 / 486-9020

*New Jersey - 609 / 984-1389

New Mexico - 505 / 827-4230

*New York - 518 / 457-2574

North Carolina - 919 / 807-2875

Oregon - 503 / 378-3272

Puerto Rico - 787 / 754-2172

South Carolina - 803 / 734-9669

Tennessee - 615 / 741-2793

Utah - 801 / 530-6901

Vermont - 802 / 828-2765

Virginia - 804 / 786-6613

Virgin Islands - 340 / 772-1315

Washington - 360 / 902-5601

Wyoming - 307 / 777-7786

*Public Sector only

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

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

Have questions?

If you need help in filling out the *Log* or *Summary,* or if you have questions about whether a case is recordable, contact us. We'll be happy to help you. You can:

- Visit us online at: **www.osha.gov**
- Call your regional or state plan office. You'll find the phone number listed inside this cover.

ATTACHMENT 4
Material Safety Data Sheets

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Material name **PUREGOLD® MEDIUM CHIPS**

Version No. 13

Revision date 16-March-2012

CAS # 1302-78-9

Synonym(s) SMECTITE * BENTONITE * MONTMORILLONITE

Manufacturer information

CETCO
Drilling Products Group
2870 Forbs Avenue
Hoffman Estates, IL 60192 United States
safetydata@amcol.com
http://www.cetco.com/
General Information (800) 527-9948
CHEMTREC® (800) 424-9300

2. Hazards Identification

Potential health effects

Eyes Dust or powder may irritate eye tissue. Mild irritant to eyes (according to the modified Kay & Calandra criteria)

Inhalation Inhalation of dusts may cause respiratory irritation.

Ingestion No significant adverse effects are expected upon ingestion of the product.

Signs and Symptoms None known.

3. Composition/Information on Ingredients

Components	CAS #	Percent
Bentonite	1302-78-9	100

Constituents	CAS #	Percent
SMECTITE GROUP MINERALS	1318-93-0	
Calcium carbonate	471-34-1	
Quartz	14808-60-7	<= 8
Cristobalite	14464-46-1	<= 2

Composition comments Bentonite is composed mainly of smectite group minerals but the composition is varied, as expected for a UVCB substance, and other mineral constituents will be present in small and varying amounts. These minor constituents are not relevant for classification and labelling. The purity of the product is 100% w/w. Impurities are not applicable for a UVCB substance.

4. FIRST-AID MEASURES

First aid procedures

Eye contact No specific first aid measures noted. Flush thoroughly with water. If irritation occurs, get medical assistance.

Skin contact No specific first aid measures noted. Wash skin with soap and water. Get medical attention if irritation develops and persists.

Inhalation No specific first aid measures noted. Move to fresh air. Call a physician if symptoms develop or persist.

Ingestion No specific first aid measures noted. Rinse mouth thoroughly. Get medical attention if any discomfort occurs.

Notes to physician Provide general supportive measures and treat symptomatically.

General advice No hazards which require special first aid measures. Provide general supportive measures and treat symptomatically.

5. Fire-fighting measures

Flammable properties The product is not flammable.

Extinguishing media

Suitable extinguishing media Use any media suitable for the surrounding fires.

Unsuitable extinguishing media Not applicable, non-combustible.

Protection of firefighters

Specific hazards arising from the chemical None known. The product itself does not burn.

Protective equipment for firefighters None known.

Fire fighting equipment/instructions Material can be slippery when wet.

Explosion data

Sensitivity to static discharge Not available.

Sensitivity to mechanical impact Not available.

6. ACCIDENTAL RELEASE MEASURES

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

Environmental precautions No special environmental precautions required. Prevent further leakage or spillage if safe to do so.

7. HANDLING AND STORAGE

Handling Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. In case of insufficient ventilation, wear suitable respiratory equipment.

Storage Store in a dry area. Keep the container dry. No special restrictions on storage with other products.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	TWA	3 mg/m3	Respirable particles.
		10 mg/m3	Inhalable particles.

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	TWA	3 mg/m3	Respirable particles.
		10 mg/m3	Total particulate.

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	TWA	3 mg/m3	Respirable fraction.
		10 mg/m3	Total dust.

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	TWA	3 mg/m3	Respirable particles.
		10 mg/m3	Inhalable

Canada. Quebec OELS. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	TWA	10 mg/m3	Total dust.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.

US. OSHA Table Z-3 (29 CFR 1910.1000)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 Mppcf	Total dust.
		15 Mppcf	Respirable fraction.

Engineering controls Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn.

Personal protective equipment

Eye / face protection Wear dust-resistant safety goggles where there is danger of eye contact.

Skin protection No special protective equipment required. Normal work clothing (long sleeved shirts and long pants) is recommended.

Respiratory protection Use a particulate filter respirator for particulate concentrations exceeding the Occupational Exposure Limit.

9. Physical & Chemical Properties

Appearance	Tablet. Pellets.
Physical state	Solid.
Form	Various.
Colour	Various.
Odour	None.
Odour threshold	Not applicable.
pH	8.5 - 11
Vapour pressure	Not applicable.
Vapour density	Not applicable.
Boiling point	Not applicable.
Melting point/freezing point	> 450 °C (> 842 °F) / Not applicable.
Solubility (water)	< 0.9 mg/l
Specific gravity	Not applicable.
Relative density	2.6 g/cm³
Flash point	Not applicable.
Flammability limits in air, upper, % by volume	Not applicable.
Flammability limits in air, lower, % by volume	Not applicable.
Auto-ignition temperature	Not applicable.
VOC	0 %
Viscosity	Not applicable.
Viscosity temperature	Not applicable.
Percent volatile	0 %
Partition coefficient (n-octanol/water)	Not applicable. Not applicable.
Flammability (Train fire)	Not applicable.

Bulk density	0.9 - 1.4 g/cm³
Molecular weight	Not applicable.
Molecular formula	UVCB Substance
Other data	
Decomposition temperature	> 500 °C (> 932 °F)
Explosive limit	Not applicable.
Explosive properties	Not explosive
Explosivity	Not applicable.
Flame extension	Not applicable.
Flammability	Not applicable.
Flammability (flash back)	Not applicable.
Flammability (Heat of combustion)	Not applicable.
Flammability (solid, gas)	This product is not flammable.
Flammability class	Not applicable.
Flash point class	Not flammable
Oxidizing properties	None.
pH in aqueous solution	8.5 - 11

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions.
Conditions to avoid	Moisture.
Incompatible materials	None known.
Hazardous decomposition products	None.
Possibility of hazardous reactions	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological data

Product	Species	Test results
Bentonite (1302-78-9)		
Acute		
Inhalation		
LC50	Rat	> 5.27 mg/l, 4 hr, OECD 436
Oral		
LD50	Rat	> 2000 mg/kg, OECD 425

Acute effects	Not classified.
Sensitisation	Not classified.
Carcinogenicity	This product contains <10% total crystalline silica. The respirable crystalline silica as determinec by the SWeRF method is <1% w/w.
Mutagenicity	Not classified.
Reproductive effects	Not classified.
Symptoms and target organs	None known.

12. ECOLOGICAL INFORMATION

Ecotoxicological data

Product		Species	Test results
Bentonite (1302-78-9)			
Crustacea	EC50	Daphnia	> 100 mg/l, 48 hours
Other	EC50	Freshwater algae	> 100 mg/l, 72 hours

Product		Species	Test results
	LC50	Freshwater fish	16000 mg/l, 96 hours
		Marine water fish	2800 - 3200 mg/l, 24 hours
Aquatic			
Crustacea	EC50	Coon stripe shrimp (Pandalus danae)	24.8 mg/l, 96 hours
		Dungeness or edible crab (Cancer magister)	81.6 mg/l, 96 hours
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	19000 mg/l, 96 hours

Persistence and degradability Not relevant for inorganic substances

Bioaccumulation / Accumulation Will not bio-accumulate.

Mobility in environmental media Low water solubility, expected to sink and migrate into the sediment. Expected to partition to sediment and wastewater solids.

13. DISPOSAL CONSIDERATIONS

Disposal instructions Dispose in accordance with all applicable regulations.

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Store containers and offer for recycling of material when in accordance with the local regulations.

14. Transport information

TDG

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. REGULATORY INFORMATION

WHMIS status Controlled

WHMIS Classification D2A - Other Toxic Effects-VERY TOXIC

WHMIS labeling

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

16. OTHER INFORMATION

Recommended restrictions

None known.

Further information

UVCB = a substance of Unknown or Variable composition, Complex reaction products or Biological materials SWERF = Size Weighted Respirable Fraction methodology is a scientific method developed to quantify the content of respirable particles within a bulk product. All details about the SWERF method are available at www.crystallinesilica.eu.

HMIS® ratings

Health: 1*
Flammability: 0
Physical Hazard: 0

NFPA ratings

Health: 1
Flammability: 0
Instability: 0

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The manufacturer expressly does not make any representations, warranties, or guarantees as to its accuracy, reliability or completeness nor assumes any liability, for its use. It is the user's responsibility to verify the suitability and completeness of such information for each particular use. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Prepared by

EHS Department

Issue date

25-September-2011

Revision date

16-March-2012

This data sheet contains changes from the previous version in section(s):

IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING: Synonyms
Physical & Chemical Properties: Appearance
TOXICOLOGICAL INFORMATION: Carcinogenicity
REGULATORY INFORMATION: United States
OTHER INFORMATION: Further information

QUIKRETE®
CEMENT & CONCRETE PRODUCTS™

Portland Cement Based Concrete Products

MATERIAL SAFETY DATA SHEET
(Complies with OSHA 29 CFR 1910.1200)

SECTION I: PRODUCT IDENTIFICATION

The QUIKRETE® Companies
One Securities Centre
3490 Piedmont Road, Suite 1300
Atlanta, GA 30329

Emergency Telephone Number
(770) 216-9580

Information Telephone Number
(770) 216-9580

MSDS J1
Revision: Aug-13

QUIKRETE® Product Name	Code #
CONCRETE MIX	1101
FENCE POST MIX	1005
FIBER-REINFORCED CONCRETE MIX	1006
CRACK RESISTANT CONCRETE MIX	1006-80
QUIKRETE 5000 CONCRETE MIX	1007
QUIKRETE 6000 CONCRETE MIX	1007
LIGHTWEIGHT CONCRETE MIX	1008
HANDICRETE CONCRETE MIX	1141-59, -60, -80
MAXIMUM YIELD CONCRETE MIX	1100-80
B-CRETE	1101-81
PRO-FINISH QUIKRETE 5000	1007-85
BASIC CONCRETE MIX	1015
RIP RAP	1129
ALL-STAR CONCRETE MIX	1121
ALL-STAR CRACK RESISTANT CONCRETE MIX	1470-03
ALL-STAR 5000 CONCRETE MIX	1470-01
RED-E-CRETE CONCRETE MIX	1101-91, -87; 1141-62, -63, -92, -93
RIP RAP SCRIM	1134-80
FIBER REINFORCED DECK MIX	1251-80, -81
PRO-FINISH CRACK RESISTANT CONCRETE MIX	1006-68
COUNTERTOP MIX	1106-80
RITEMIX CONCRETE	1171-60
GREEN CONCRETE MIX	1101-63, -73
FLOWCRETE 5000 (MIX 801)	8080026/NR80026

Product Use: Portland cement-based, aggregated products for general construction

SECTION II - HAZARD IDENTIFICATION

Route(s) of Entry: Inhalation, Skin, Ingestion

Acute Exposure: Product becomes alkaline when exposed to moisture. Exposure can dry the skin, cause alkali burns and affect the mucous membranes. Dust can irritate the eyes and upper respiratory system. Toxic effects noted in animals include, for acute exposures, alveolar damage with pulmonary edema.
Chronic Exposure: Dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis.
Carcinogenicity: Since Portland cement and blended cements are manufactured from raw materials mined from the earth (limestone, marl, sand, shale, etc.) and process heat is provided by burning fossil fuels, trace, but detectable, amounts of naturally occurring, and possibly harmful, elements may be found during chemical analysis. Under ASTM standards, Portland cement may contain 0.75 % insoluble residue. A fraction of these residues may be free crystalline silica. Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs and possibly cancer. There is evidence that exposure to respirable silica or the disease silicosis is associated with an increased incidence of Scleroderma, tuberculosis and kidney disorders.

Carcinogenicity Listings:		
	NTP:	Known carcinogen
	OSHA:	Not listed as a carcinogen
	IARC Monographs:	Group 1 Carcinogen
	California Proposition 65:	Known carcinogen

NTP: The National Toxicology Program, in its "Ninth Report on Carcinogens" (released May 15, 2000) concluded that "Respirable crystalline silica (RCS), primarily quartz dusts occurring in industrial and occupational settings, is *known to be a human carcinogen*, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to RCS and increased lung cancer rates in workers exposed to crystalline silica dust (reviewed in IAC, 1997; Brown *et al*., 1997; Hind *et al*., 1997)

IARC: The International Agency for Research on Cancer ("IARC") concluded that there was "*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources", and that there is "*sufficient evidence* in experimental animals for the carcinogenicity of quartz or cristobalite." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is *carcinogenic to humans (*Group 1)." The IARC evaluation noted that "carcinogenicity was not detected in all industrial circumstances or studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of carcinogenic Risks to Humans, Volume 68, "Silica, Some Silicates." (1997)

Signs and Symptoms of Exposure: Symptoms of excessive exposure to the dust include shortness of breath and reduced pulmonary function. Excessive exposure to skin and eyes especially when mixed with water can cause caustic burns as severe as third degree.

Medical Conditions Generally Aggravated by Exposure: Individuals with sensitive skin and with pulmonary and/or respiratory disease, including, but not limited to, asthma and bronchitis, or subject to eye irritation, should be precluded from exposure. Exposure to crystalline silica or the disease silicosis is associated with increased incidence of scleroderma, Tuberculosis and possibly increased incidence of kidney lesions.
Chronic Exposure: Dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis. (May contain trace (<0.05 %) amounts of chromium salts or compounds including hexavalent chromium, or other metals found to be hazardous or toxic in some chemical forms. These metals are mostly present as trace substitutions within the principal minerals)

Medical Conditions Generally Aggravated by Exposure: Individuals with sensitive skin and with pulmonary and/or respiratory disease, including, but not limited to, asthma and bronchitis, or subject to eye irritation, should be precluded from exposure.

SECTION III - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components	CAS No.	%	PEL (OSHA) mg/M^3	TLV (ACGIH) mg/M^3
Portland Cement	65997-15-1	10-30	5	5
Lime	01305-62-0	0-5	5	5
Silica Sand, crystalline	14808-60-7	70-90	$\frac{10}{\%SiO_2+2}$	0.025 (respirable)
May contain one or more of the following ingredients:				
Amorphous Silica (From fly Ash)	07631-86-9	$\frac{80}{\%SiO_2+2}$	10	
Alumina (From Fly Ash)	01344-28-1	5	5	
Limestone Dust	01317-65-3	5	5	
Calcium Sulfate	10101-41-4 or 13397-24-5	5	5	

Other Limits: National Institute for Occupational Safety and Health (NIOSH). Recommended standard maximum permissible concentration=0.05 mg/M^3 (respirable free silica) as determined by a full-shift sample up to 10-hour working day, 40-hour work week. See NIOSH Criteria for a Recommended Standard Occupational Exposure to Crystalline Silica.

SECTION IV – First Aid Measures

Eyes: Immediately flush eye thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.
Skin: Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment if irritation or inflammation develops or persists. Seek immediate medical treatment in the event of burns.
Inhalation: Remove person to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration. Seek medical help if coughing and other symptoms do not subside. Inhalations of large amounts of Portland cement require immediate medical attention.
Ingestion: Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

SECTION V - FIRE AND EXPLOSION HAZARD DATA

Flammability: Noncombustible and not explosive.
Auto-ignition Temperature: Not Applicable
Flash Points: Not Applicable

SECTION VI – ACCIDENTAL RELEASE MEASURES

If spilled, use dustless methods (vacuum) and place into covered container for disposal (if not contaminated or wet). Use adequate ventilation to keep exposure to airborne contaminants below the exposure limit.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND STORAGE

Do not allow water to contact the product until time of use. DO NOT BREATHE DUST. In dusty environments, the use of an OSHA, MSHA or NIOSH approved respirator and tight fitting goggles is recommended.

SECTION VIII – EXPOSURE CONTROL MEASURES

Engineering Controls: Local exhaust can be used, if necessary, to control airborne dust levels.

Personal Protection: The use of barrier creams or impervious gloves, boots and clothing to protect the skin from contact is recommended. Following work, workers should shower with soap and water. Precautions must be observed because burns occur with little warning -- little heat is sensed.

WARN EMPLOYEES AND/OR CUSTOMERS OF THE HAZARDS AND REQUIRED OSHA PRECAUTIONS ASSOCIATED WITH THE USE OF THIS PRODUCT.

Exposure Limits: Consult local authorities for acceptable exposure limits

SECTION IX - PHYSICAL/CHEMICAL CHARACTERISTICS

Appearance: Gray to gray-brown colored powder; Some products contain coarse aggregates.

Specific Gravity:	2.6 to 3.15	**Melting Point:**	>2700°F
Boiling Point:	>2700°F	**Vapor Pressure:**	Not Available
Vapor Density:	Not Available	**Evaporation Rate:**	Not Available
Solubility in Water:	Slight	**Odor:**	Not Available
pH:	13 (10%)	**Volatile Organic Content (VOC):**	0 g/L

SECTION X - REACTIVITY DATA

Stability: Stable.
Incompatibility (Materials to Avoid): Contact of silica with powerful oxidizing agents such as fluorine, chlorine trifluoride, manganese trioxide, or oxygen difluoride may cause fires
Hazardous Decomposition or By-products: Silica will dissolve in Hydrofluoric Acid and produce a corrosive gas – silicon tetrafluoride.
Hazardous Polymerization: Will Not Occur.
Condition to Avoid: Keep dry until used to preserve product utility.

SECTION XI – TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, Ingestion
Toxicity to Animals:
LD50: Not Available
LC50: Not Available
Chronic Effects on Humans: Conditions aggravated by exposure include eye disease, skin disorders and Chronic Respiratory conditions.
Special Remarks on Toxicity: Not Available

SECTION XII – ECOLOGICAL INFORMATION

Ecotoxicity: Not Available
BOD5 and COD: Not Available
Products of Biodegradation: Not available
Toxicity of the Products of Biodegradation: Not available
Special Remarks on the Products of Biodegradation: Not available

SECTION XIII – DISPOSAL CONSIDERATIONS

Waste Disposal Method: The packaging and material may be land filled; however, material should be covered to minimize generation of airborne dust. This product is not classified as a hazardous waste under the authority of the RCRA (40CFR 261) or CERCLA (40CFR 117&302).

SECTION XIV – TRANSPORT INFORMATION

Not hazardous under U.S. DOT and TDG regulations.

SECTION XV – OTHER REGULATORY INFORMATION

US OSHA 29CFR 1910.1200: Considered hazardous under this regulation and should be included in the employers' hazard communication program
SARA (Title III) Sections 311 & 312: Qualifies as a hazardous substance with delayed health effects
SARA (Title III) Section 313: Not subject to reporting requirements
TSCA (May 1997): Some substances are on the TSCA inventory list
Federal Hazardous Substances Act: Is a hazardous substance subject to statues promulgated under the subject act
California Regulation: WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.
Canadian Environmental Protection Act: Not listed
Canadian WHMIS Classification: Considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class D2A, E- Corrosive Material) and subject to the requirements of Health Canada's Workplace Hazardous Material Information (WHMIS). This product has been classified according to the hazard criteria of the Controlled Products Regulation (CPR). This document complies with the WHMIS requirements of the Hazardous Products Act (HPA) and the CPR.

SECTION XVI – OTHER INFORMATION

HMIS-III:

Health –
0 = No significant health risk
1 = Irritation or minor reversible injury possible
2 = Temporary or minor injury possible
3 = Major injury possible unless prompt action is taken
4 = Life threatening, major or permanent damage possible

Flammability-
0 = Material will not burn
1 = Material must be preheated before ignition will occur
2 = Material must be exposed to high temperatures before ignition

	3 = Material capable of ignition under normal temperatures
	4 = Flammable gases or very volatile liquids; may ignite spontaneously
Physical Hazard-	0 = Material is normally stable, even under fire conditions
	1 = Material normally stable but may become unstable at high temps
	2 = Materials that are unstable and may undergo react at room temp
	3 = Materials that may form explosive mixtures with water
	4 = Materials that are readily capable of explosive water reaction

Abbreviations:

ACGIH	American Conference of Government Industrial Hygienists
CAS	Chemical Abstract Service
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CPR	Controlled Products Regulations (Canada)
DOT	Department of Transportation
IARC	International Agency for Research
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicity Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TWA	Time-weighted Average
WHMIS	Workplace Hazardous Material Information System

Last Updated: August 23, 2013

NOTE: The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to silica contained in our products. END OF MSDS.

Section 1: PRODUCT AND COMPANY INFORMATION

COMMON NAME:	PVC Pipe and Fittings	
CHEMICAL NAME:	Not Applicable. Formulation. See Section 3.	
FORMULA:	Mixture	
PRODUCT CAS NO.:	Mixture. See Section 3	
RECOMMENDED USE:	PVC Pipe	
SUPPLIER:	Sanderson Pipe Corporation	Sanderson Pipe Corporation
ADDRESS:	One Enterprise West	875 International Blvd.
CITY, STATE, ZIP:	Sanderson, Florida 32087	Clarksville, Tennessee 37040
PHONE:	(904) 275-3289 (regular and emergency phone)	(931) 221-4800 (regular and emergency phone)

Section 2: HAZARDS IDENTIFICATION

All ingredients are bound in the manufacturing process and are not expected to create any hazard in handling or in use under normal conditions.

Hazard Statement
May emit fumes/vapors during extreme heating conditions such as fire. When burned, decomposition occurs and fumes may cause irritation to eyes and respiratory system.

Classification of Mixture
Eye and respiratory system irritation.

Signal Word
Warning

Precautionary Statement
Avoiding breathing fumes during high heating and decomposition conditions.

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Boiling Point	N/A	Appearance & Odor	Rigid / No Odor

Melting Point	N/A	% Volatile by Weight	N/A
Specific Gravity (H_2O=1)	1.35-1.55	pH	N/A
Solubility in Water	Insoluble	Particle Size	N/A
Vapor Pressure	N/A	Vapor Density (Air + 1)	N/A

Section 4: FIRST AID MEASURES	
If irritation persists from exposure to decomposition products, remove the affected individual from the area. Provide protection before re-entry.	
Section 5: FIRE FIGHTING MEASURES	
Flash Point	Not applicable to solid products
Ignition Temperature	>730°F (>388°C)
Flammable Limits in Air (% by volume)	Lower: N/A Upper: N/A
Extinguishing Media	Water ABC dry chemical Protein-type air foams Carbon dioxide may be ineffective on larger fires due to a lack of cooling capacity which may result in re-ignition.
Special Fire Fighting Procedures	Wear positive pressure self-contained breathing apparatus (SCBA). Personnel not having suitable respiratory protection must leave the area to prevent significant exposure to toxic combustive gases from any source. In enclosed or poorly-ventilated areas, wear SCBA during cleanup immediately after a fire as well as during the attack phase of fire-fighting operation.
Unusual Fire and Explosion Hazards	None known.
Section 6: ACCIDENTAL RELEASE MEASURES	
Threshold Limit Value	None established.
Efforts of Overexposure	There are no significant health hazards from vinyl compound at ambient temperatures. Inhalation of decomposition or combustion products, especially hydrogen chloride, will cause irritation of the respiratory tract, eyes, and skin. Depending on the severity of exposure, physiological response will be coughing, pain, and inflammation. Individuals with bronchial asthma and other types of chronic obstruction respiratory diseases may develop bronchial spasms if exposure is prolonged.

Section 7: HANDLING AND STORAGE	
Environmental Precautions	
Steps to be taken in case material is released or spilled.	Material is inert. Place into container for reuse or disposal.
Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION	
Special Protection Information	
Ventilation	Provide efficient exhaust at all operations creating fumes or vapor (cutting, or sawing, machining, heat welding, thermofolding, and other operations involving heat sufficient to result in degradation should be examined to ensure adequate ventilation.
Respiratory Protection	Not normally required. If overheating results in decomposition resulting in smoke or fumes, NIOSH/MSHA approved combination high efficiency particulate filter with organic vapor cartridge can be used. Gross decomposition may require the use of a positive pressure self-contained breathing apparatus.
Protective Equipment	Wear safety glasses.
Section 9: PHYSICAL AND CHEMICAL PROPERTIES	
Special Precautions	Certain operations, such as the installation of piping systems, may require the use of solvent cements. The user must obtain and comply with all safety precautions recommended by solvent cement manufacturers. Avoid continued or prolonged breathing vapors produced by overheating.
Section 10: STABILITY AND REACTIVITY	
Stability	Stable
Hazardous Decomposition Products	CO, CO_2, Hydrogen chloride, and small amounts of benzene, and aromatic and aliphatic hydrocarbons.

Hazardous Polymerization	Will not occur

Section 11: TOXICOLOGICAL INFORMATION

No toxicological data is available for the finished product.

Section 12: ECOLOGICAL INFORMATION

Material is inert. No known significant or critical hazards.

Section 13: DISPOSAL CONSIDERATIONS

For waste disposal, dispose of in accordance with federal, state, and local regulations. For waste disposal purposed, these products are not defined or designated as hazardous by current provision of the Federal Conservation and Recovery Act (RCRA) 40CFR261.

Section 14: TRANSPORT INFORMATION

Proper Shipping Name	N/A
Hazard Class	Non-hazardous
Shipping Label	None required
UN/NA Hazard Number	Not required

Section 15: REGULATORY INFORMATION

In compliance with TSCA 8(b) that all ingredients are listed on the US Toxic Substances Control Act inventory.

Section 16: OTHER INFORMATION

Users Responsibility

A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if or where precautions, in addition to those described herein, should be passed on to your customers or employees, as the case may be. Sanderson Pipe Corporation must rely on the user to utilize the information we have supplied to develop work practice guidelines and employee instructional programs for the individual operation.

Disclaimer of Liability

As the conditions or methods of users are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this material. Information contained herein is believed to be true and accurate, but all statements or suggestions are made without warranty, expressed or implied, regarding accuracy of the information, the hazards connected with the use of the material or the responsibility of the user. The information used in this letter was compiled from other SDS letters with similar products.

U.S. SILICA COMPANY
SAFETY DATA SHEET

1. IDENTIFICATION

Product identifier: Silica Sand or Ground Silica; crystalline silica (quartz)

Product Name/Trade Names:
Sand and Ground Silica Sand (sold under various names: ASTM TESTING SANDS • GLASS SAND • FILPRO® · FLINT SILICA • DM-SERIES • F-SERIES • FOUNDRY SANDS • FJ-SERIES H-SERIES • L-SERIES • N-SERIES • NJ SERIES • OK-SERIES • P-SERIES • T-SERIES • hydraulic fracturing sand, all sizes • frac sand, all sizes • MIN-U-SIL® Fine Ground Silica • MYSTIC WHITE® • #1 DRY • #1 SPECIAL • PENN SAND® • PRO WHITE® · SILURIAN® · Q-ROK® • SIL-CO-SIL® Ground Silica • MICROSIL® • SUPERSIL® • MASON SAND • GS SERIES • PERSPEC • proppant, all sizes • SHALE FRAC® - SERIES • KOSSE WHITE® • OTTAWA WHITE® • OPTIJUMP® • LIGHTHOUSE ™

Chemical Name or Synonym:
Crystalline Silica (Quartz), Sand, Silica Sand, Flint, Ground Silica, Fine Ground Silica, Silica Flour.

Recommended use of the chemical and restrictions on use: (non-exhaustive list): brick, ceramics, foundry castings, glass, grout, hydraulic fracturing sand, frac sand, proppant, mortar, paint and coatings, silicate chemistry, silicone rubber, thermoset plastics.

DO NOT USE U.S. SILICA COMPANY SAND OR GROUND SILICA FOR SAND BLASTING

Manufacturer:
U.S. Silica Company
8490 Progress Drive, Suite 300
Frederick, MD 21701
U.S.A.

Phone: 800-243-7500
Emergency Phone: 301-682-0600
Fax: 301-682-0690

2. HAZARD(S) IDENTIFICATION

Classification:

Physical	Health
Not Hazardous	Carcinogen Category 1A Specific Target Organ Toxicity – Repeated Exposure Category 1

DANGER
May cause cancer by inhalation.
Causes damage to lungs through prolonged or repeated exposure by inhalation.
Response:
If exposed or concerned: Get medical advice.
Disposal:
Dispose of contents/containers in accordance with local regulation

Prevention
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust.
Do not eat, drink or smoke when using this product.
Wear protective gloves and safety glasses or goggles.
In case of inadequate ventilation wear respiratory protection.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS No.	Percent
Crystalline Silica (quartz)	14808-60-7	95-99.9

4. FIRST-AID MEASURES

Inhalation: First aid is not generally required. If irritation develops from breathing dust, move the person from the overexposure and seek medical attention if needed.
Skin contact: First aid is not required.
Eye contact: Wash immediately with plenty of water. Do not rub eyes. If irritation persists, seek medical attention.
Ingestion: First aid is not required.
Most important symptoms/effects, acute and delayed: Particulates may cause abrasive eye injury. Inhalation of dust may cause respiratory tract irritation. Symptoms of exposure may include cough, sore throat, nasal congestion, sneezing, wheezing and shortness of breath. Prolonged inhalation of respirable crystalline silica above certain concentrations may cause lung diseases, including silicosis and lung cancer.
Indication of immediate medical attention and special treatment, if necessary: Immediate medical attention is not required.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media: Use extinguishing media appropriate for surrounding fire.

Specific hazards arising from the chemical: Product is not flammable, combustible or explosive.

Special protective equipment and precautions for fire-fighters: None required.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures: Wear appropriate protective clothing and respiratory protection (see Section 8). Avoid generating airborne dust during clean-up.

Environmental precautions: No specific precautions. Report releases to regulatory authorities if required by local, state and federal regulations.

Methods and materials for containment and cleaning up: Avoid dry sweeping. Do not use compressed air to clean spilled sand or ground silica. Use water spraying/flushing or ventilated or HEPA filtered vacuum cleaning system, or wet before sweeping. Dispose of in closed containers.

7. HANDLING AND STORAGE

Precautions for safe handling:
Avoid generating dust. Do not breathe dust. Do not rely on your sight to determine if dust is in the air. Respirable crystalline silica dust may be in the air without a visible dust cloud. Use adequate exhaust

ventilation and dust collection to reduce respirable crystalline silica dust levels to below the permissible exposure limit ("PEL"). Maintain and test ventilation and dust collection equipment. Use all available work practices to control dust exposures, such as water sprays. Practice good housekeeping. Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Keep airborne dust concentrations below permissible exposure limits.

Where necessary to reduce exposures below the PEL or other applicable limit (if lower than the PEL), wear a respirator approved for silica containing dust when using, handling, storing or disposing of this product or bag. See Section 8, for further information on respirators. Do not alter the respirator. Do not wear a tight-fitting respirator with facial hair such as a beard or mustache that prevents a good face to face piece seal between the respirator and face. Maintain, clean, and fit test respirators in accordance with applicable standards. Wash or vacuum clothing that has become dusty.

Participate in training, exposure monitoring, and health surveillance programs to monitor any potential adverse health effects that may be caused by breathing respirable crystalline silica. The OSHA Hazard Communication Standard, 29 CFR Sections 1910.1200, 1915.1200, 1917.28, 1918.90, 1926.59 and 1928.21, and state and local worker or community "right-to-know" laws and regulations should be strictly followed.

DO NOT USE U.S. SILICA COMPANY SAND OR GROUND SILICA FOR SAND BLASTING

Conditions for safe storage, including any incompatibilities: Use dust collection to trap dust produced during loading and unloading. Keep containers closed and store bags to avoid accidental tearing, breaking, or bursting.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure guidelines:

Component	OSHA PEL	ACGIH TLV	NIOSH REL
Crystalline Silica (quartz)	10 mg/m3 $\%SiO_2 + 2$ TWA (respirable dust) 30 mg/m3 $\%SiO_2 + 2$ TWA (total dust)	0.025 mg/m3 TWA (respirable dust)	0.05 mg/m3 TWA (respirable dust)

If crystalline silica (quartz) is heated to more than 870°C, quartz can change to a form of crystalline silica known as tridymite; if crystalline silica (quartz) is heated to more than 1470°C, quartz can change to a form of crystalline silica known as cristobalite. The OSHA PEL for crystalline silica as tridymite or cristobalite is one-half of the OSHA PEL for crystalline silica (quartz).

Appropriate engineering controls: Use adequate general or local exhaust ventilation to maintain concentrations in the workplace below the applicable exposure limits listed above.

Respiratory protection: If it is not possible to reduce airborne exposure levels to below the OSHA PEL or other applicable limit with ventilation, use the table below to assist you in selecting respirators that will reduce personal exposures to below the OSHA PEL. This table is part of the NIOSH Respirator Selection Logic, 2004, Chapter III, Table 1, "Particulate Respirators". The full document can be found at www.cdc.gov/niosh/npptl/topics/respirators; the user of this MSDS is directed to that site for information concerning respirator selection and use. The assigned protection factor (APF) is the maximum anticipated level

of protection provided by each type of respirator worn in accordance with an adequate respiratory protection program. For example, an APF of 10 means that the respirator should reduce the airborne concentration of a particulate by a factor of 10, so that if the workplace concentration of a particulate was 150 ug/m3, then a respirator with an APF of 10 should reduce the concentration of particulate to 15 ug/m3. In using chemical cartridges, consideration must be given to selection of the correct cartridge for the chemical exposure and the maximum use concentration for the cartridge. In additional a cartridge change-out schedule must be developed based on the concentrations in the workplace.

Assigned protection factor [1]	**Type of Respirator** (Use only NIOSH-certified respirators)
10	Any air-purifying elastomeric half-mask respirator equipped with appropriate type of particulate filter. [2] Appropriate filtering facepiece respirator. [2,3] Any air-purifying full facepiece respirator equipped with appropriate type of particulate filter. [2] Any negative pressure (demand) supplied-air respirator equipped with a half-mask.
25	Any powered air-purifying respirator equipped with a hood or helmet and a high efficiency (HEPA) filter. Any continuous flow supplied-air respirator equipped with a hood or helmet.
50	Any air-purifying full facepiece respirator equipped with N-100, R-100, or P-100 filter(s). Any powered air-purifying respirator equipped with a tight-fitting facepiece (half or full facepiece) and a high-efficiency filter. Any negative pressure (demand) supplied-air respirator equipped with a full facepiece. Any continuous flow supplied-air respirator equipped with a tight-fitting facepiece (half or full facepiece). Any negative pressure (demand) self-contained respirator equipped with a full facepiece.
1,000	pressure-demand supplied-air respirator equipped with a half-mask.

1. The protection offered by a given respirator is contingent upon (1) the respirator user adhering to complete program requirements (such as the ones required by OSHA in 29CFR1910.134), (2) the use of NIOSH-certified respirators in their approved configuration, and (3) individual fit testing to rule out those respirators that cannot achieve a good fit on individual workers.
2. Appropriate means that the filter medium will provide protection against the particulate in question.
3. An APF of 10 can only be achieved if the respirator is qualitatively or quantitatively fit tested on individual workers.

Skin protection: Maintain good industrial hygiene. Protection recommended for workers suffering from dermatitis or sensitive skin.

Eye protection: Safety glasses with side shields or goggles recommended if eye contact is anticipated.

Other: None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.): White or tan sand: granular, crushed or ground to a powder.
Odor: None.

Odor threshold: Not determined	**pH:** 6-8
Melting point/freezing point: 3110°F/1710°C	**Boiling point/range:** 4046°F/2230°C
Flash point: Not applicable	**Evaporation rate:** Not applicable
Flammable limits: LEL: Not applicable	**UEL:** Not applicable
Vapor pressure: Not applicable	**Vapor density:** Not applicable
Relative density: 2.65	**Solubility(ies):** Insoluble in water

Partition coefficient: n-octanol/water: Not applicable	**Auto-ignition temperature:** Not determined
Decomposition temperature: Not determined	**Viscosity:** Not applicable
Flammability (solid, gas): Not applicable	

10. STABILITY AND REACTIVITY

Reactivity: Not reactive under normal conditions of use.
Chemical stability: Stable
Possibility of hazardous reactions: Contact with powerful oxidizing agents, such as fluorine, chlorine trifluoride and oxygen difluoride, may cause fires.
Conditions to avoid: Avoid generation of dust in handling and use.
Incompatible materials: Powerful oxidizers such as fluorine, chlorine trifluoride, and oxygen difluoride and hydrofluoric acid.
Hazardous decomposition products: Silica will dissolve in hydrofluoric acid and produce a corrosive gas, silicon tetrafluoride.

11. TOXICOLOGICAL INFORMATION

Acute effects of exposure:
Inhalation: Inhalation of dust may cause respiratory tract irritation. Symptoms of exposure may include cough, sore throat, nasal congestion, sneezing, wheezing and shortness of breath.
Ingestion: Ingestion in an unlikely route of exposure. If dust is swallowed, it may irritate the mouth and throat.
Skin contact: No adverse effects are expected.
Eye contact: Particulates may cause abrasive injury.

Chronic effects: Prolonged **i**nhalation of respirable crystalline silica may cause lung disease, silicosis, lung cancer and other effects as indicated below.

The method of exposure that can lead to the adverse health effects described below is inhalation.

A. SILICOSIS
Silicosis can exist in several forms, chronic (or ordinary), accelerated, or acute:

Chronic or Ordinary Silicosis is the most common form of silicosis, and can occur after many years (10 to 20 or more) of prolonged repeated inhalation of relatively low levels of airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis. Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Complicated silicosis or PMF symptoms, if present, are shortness of breath and cough. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (cor pumonale).

Accelerated Silicosis can occur with prolonged repeated inhalation of high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of initial exposure. Progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except

that lung lesions appear earlier and progression is more rapid.

Acute Silicosis can occur after the repeated inhalation of very high concentrations of respirable crystalline silica over a short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough, weakness and weight loss. Acute silicosis is fatal.

B. CANCER
IARC - The International Agency for Research on Cancer ("IARC") concluded that "crystalline silica in the form of quartz or cristobalite dust is *carcinogenic to humans (Group 1)".* For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C,"A Review of Human Carcinogens: Arsenic, Metals, Fibres and Dusts " (2011).

NTP classifies "Silica, Crystalline (respirable size)" as Known to be a human carcinogen.

C. AUTOIMMUNE DISEASES
Several studies have reported excess cases of several autoimmune disorders -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis -- among silica-exposed workers.

D. TUBERCULOSIS
Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to tuberculosis bacteria. Individuals with chronic silicosis have a three-fold higher risk of contracting tuberculosis than similar individuals without silicosis.

E. KIDNEY DISEASE
Several studies have reported excess cases of kidney diseases, including end stage renal disease, among silica-exposed workers. For additional information on the subject, the following may be consulted: "Kidney Disease and Silicosis", Nephron, Volume 85, pp. 14-19 (2000).

F. NON-MALIGNANT RESPIRATORY DISEASES
The reader is referred to Section 3.5 of the NIOSH Special Hazard Review cited below for information concerning the association between exposure to crystalline silica and chronic bronchitis, emphysema and small airways disease. There are studies that disclose an association between dusts found in various mining occupations and non-malignant respiratory diseases, particularly among smokers. It is unclear whether the observed associations exist only with underlying silicosis, only among smokers, or result from exposure to mineral dusts generally (independent of the presence or absence of crystalline silica, or the level of crystalline silica in the dust).

Sources of information:
The ***NIOSH Hazard Review - Occupational Effects of Occupational Exposure to Respirable Crystalline Silica*** published in April 2002 summarizes and discusses the medical and epidemiological literature on the health risks and diseases associated with occupational exposures to respirable crystalline silica. The *NIOSH Hazard Review* is available from NIOSH - Publications Dissemination, 4676 Columbia Parkway, Cincinnati, OH 45226, or through the NIOSH web site, www.cdc.gov/niosh/topics/silica, then click on the link "NIOSH Hazard Review: Health Effects of Occupational Exposure to Respirable Crystalline Silica".

For a more recent review of the health effects of respirable crystalline silica, the reader may consult *Fishman's Pulmonary Diseases and Disorders*, Fourth Edition, Chapter 57. "Coal Workers' Lung Diseases and Silicosis".

Finally, the US Occupational Safety and Health Administration (OSHA) published a summary of respirable crystalline silica health effects in connection with OSHA's Proposed Rule regarding occupational exposure to

respirable crystalline silica. The summary was published in the September 12, 2013 Federal Register, which can be found at www.federalregister.gov/articles/2013/09/12/2013-20997/occupational-exposure-to-respirable-crystalline-silica.

.

Numerical measures of toxicity:
Crystalline Silica (quartz): LD50 oral rat >22,500 mg/kg

12. ECOLOGICAL INFORMATION

Ecotoxicity: Crystalline silica (quartz) is not known to be ecotoxic.
Persistence and degradability: Silica is not degradable.
Bioaccumulative potential: Silica is not bioaccumulative.
Mobility in soil: Silica is not mobile in soil.
Other adverse effects: No data available

13. DISPOSAL CONSIDERATIONS

Discard any product, residue, disposable container or liner in full compliance with national regulations.

14. TRANSPORT INFORMATION

UN number: None
UN proper shipping name: Not regulated
Transport hazard classes(es): None
Packing group, if applicable: None
Environmental hazards: None

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code): Not determined
Special precautions: None known.

15. REGULATORY INFORMATION

UNITED STATES (FEDERAL AND STATE)

TSCA Status: Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.

RCRA: This product is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 40 CFR §302.

Emergency Planning and Community Right to Know Act (SARA Title III): This product contains the following chemicals subject to SARA 302 or SARA 313 reporting: None above the de minimus concentrations.

Clean Air Act: Crystalline silica (quartz) mined and processed by U.S. Silica Company is not processed with or does not contain any Class I or Class II ozone depleting substances.

FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3)(xxvi).

California Proposition 65: Crystalline silica (airborne particles of respirable size) is classified as a substance known to the State of California to be a carcinogen.

California Inhalation Reference Exposure Level (REL): California established a chronic non-cancer effect REL of 3 µg for silica (crystalline, respirable). A chronic REL is an airborne level of a substance at or below which no non-cancer health effects are anticipated in individuals indefinitely exposed to the substance at that level.

Massachusetts Toxic Use Reduction Act: Silica, crystalline (respirable size, <10 microns) is "toxic" for purposes of the Massachusetts Toxic Use Reduction Act.

Pennsylvania Worker and Community Right to Know Act: Quartz is a hazardous substance under the Act, but it is not a special hazardous substance or an environmental hazardous substance.

Texas Commission on Environmental Quality: The Texas CEQ has established chronic and acute Reference Values and short term and long term Effects Screening Levels for crystalline silica (quartz). The information can be accessed through www.tceq.texas.gov.

CANADA

Domestic Substances List: U. S. Silica Company products, as naturally occurring substances, are on the Canadian DSL.

WHMIS Classification: D2A

OTHER NATIONAL INVENTORIES

Australian Inventory of Chemical Substances (AICS): All of the components of this product are listed on the AICS inventory or exempt from notification requirements.

China: Silica is listed on the IECSC inventory or exempt from notification requirements.

Japan Ministry of International Trade and Industry (MITI): All of the components of this product are existing chemical substances as defined in the Chemical Substance Control Law Registry Number 1-548.

Korea Existing Chemicals Inventory (KECI) (set up under the Toxic Chemical Control Law): Listed on the ECL with registry number 9212-5667.

New Zealand: Silica is listed on the HSNO inventory or exempt from notification requirements.

Philippines Inventory of Chemicals and Chemical Substances (PICCS): Listed for PICCS.

Taiwan: Silica is listed on the CSNN inventory or exempt from notification requirements.

16. OTHER INFORMATION

Date of preparation/revision: February 10, 2015

Hazardous Material Information System (HMIS):

Health *
Flammability 0
Physical Hazard 0
Protective Equipment E
* For further information on health effects, see Sections 2, 8 and 11 of this MSDS.

National Fire Protection Association (NFPA):

Health 0
Flammability 0
Instability 0

Web Sites with Information about Effects of Crystalline Silica Exposure:

The U. S. Silica Company web site will provide updated links to OSHA and NIOSH web sites addressing crystalline silica issues: www.ussilica.com, click on "Info Center", then click on "Health & Safety".

The U.S. National Institute for Occupational Safety and Health (NIOSH) and Occupational Safety and Health Administration (OSHA) maintain sites with information about crystalline silica and its potential health effects. For NIOSH, http://www.cdc.gov/niosh/topics/silica; for OSHA, http://www.osha.gov/dsg/topics/silicacrystalline/index.

The IARC Monograph that includes crystalline silica, Volume 100C, can be accessed in PDF form at the IARC web site, http://monographs.iarc.fr/ENG/Monographs/PDFs/index.php.

U. S. Silica Company Disclaimer

The information and recommendations contained herein are based upon data believed to be up to-date and correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects that may be caused by purchase, resale, use or exposure to our silica. Customers and users of silica must comply with all applicable health and safety laws, regulations, and orders. In particular, they are under an obligation to carry out a risk assessment for the particular work places and to take adequate risk management measures in accordance with the national implementation legislation of EU Directives 89/391 and 98/24.

Material Safety Data Sheet

1. Chemical product and company identification

Product name	DIESEL FUEL NO. 2
MSDS #	11155
Historic MSDS #:	None.
Code	11155
Product use	Fuel.
Synonyms	Ultra Low Sulfur No.2 Diesel Fuel, Low Sulfur No.2 Diesel Fuel, High Sulfur No.2 Diesel Fuel, Amoco Diesel Fuel No. 2
Supplier	BP Products North America Inc. 150 West Warrenville Road Naperville, Illinois 60563-8460 USA
EMERGENCY HEALTH INFORMATION:	1 (800) 447-8735 Outside the US: +1 703-527-3887 (CHEMTREC)
EMERGENCY SPILL INFORMATION:	1 (800) 424-9300 CHEMTREC (USA)
OTHER PRODUCT INFORMATION	1 (866) 4 BP - MSDS (866-427-6737 Toll Free - North America) email: bpcares@bp.com

2. Composition/information on ingredients

Ingredient name	CAS #	% by weight
Petroleum distillates	68476-34-6	100
Contains: naphthalene	91-20-3	1 - 3

May also contain small quantities of proprietary performance additives.

3. Hazards identification

Physical state	Liquid.
Color	Colorless. to Various colors. (may be dyed Red., Light Green. ,Yellow.)
Emergency overview	WARNING! COMBUSTIBLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED. ASPIRATION HAZARD. HARMFUL OR FATAL IF LIQUID IS ASPIRATED INTO LUNGS. CAUSES SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION. INHALATION CAUSES HEADACHES, DIZZINESS, DROWSINESS, AND NAUSEA, AND MAY LEAD TO UNCONSCIOUSNESS.

	Do not ingest. If ingested do not induce vomiting. Avoid contact with eyes, skin and clothing. Do not breathe vapor or mist. Keep away from heat, sparks and flame. Keep container closed. Use with adequate ventilation. Use only with adequate ventilation Wash thoroughly after handling.
Routes of entry	Dermal contact. Eye contact. Inhalation. Ingestion.
Potential health effects	
Eyes	Slightly irritating to the eyes.
Skin	Causes skin irritation.
Inhalation	May cause respiratory tract irritation. Inhalation causes headaches, dizziness, drowsiness, and nausea, and may lead to unconsciousness. See toxicological Information (section 11).
Ingestion	Harmful if swallowed. Aspiration hazard if swallowed -- harmful or fatal if liquid is aspirated into lungs. See toxicological Information (section 11).
Medical conditions aggravated by over-exposure	None identified.

See toxicological Information (section 11).

4. First aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
Skin contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion	If swallowed, do NOT induce vomiting. Never give anything by mouth to an unconscious person. Aspiration hazard if swallowed- can enter lungs and cause damage. Get medical attention immediately.

5. Fire-fighting measures

Flammability of the product	Combustible liquid.
Flash point	>38 °C (Closed cup) Pensky-Martens.
Explosion limits	Lower: 0.6 % Upper: 7.5 %
Products of combustion	These products are carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide).
Unusual fire/explosion hazards	Combustible liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. Explosive in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Fire-fighting media and instructions	In case of fire, use water fog, foam, dry chemicals, or carbon dioxide. DO NOT FIGHT FIRE WHEN IT REACHES MATERIAL. Withdraw from fire and let it burn. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. First move people out of line-of-sight of the scene and away from windows.
Protective clothing (fire)	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.
Special remarks on fire hazards	Do not use water jet.

6. Accidental release measures

Personal precautions

Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (See Section: "Exposure controls/personal protection"). Follow all fire fighting procedures (See Section: "Fire-fighting measures"). Do not touch or walk through spilled material.

Environmental precautions and clean-up methods

If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion proof means to transfer material to a sealed, appropriate container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Avoid contact of spilled material with soil and prevent runoff entering surface waterways. See Section 13 for Waste Disposal Information.

Personal protection in case of a large spill

Splash goggles. Chemical resistant protective suit. Vapor respirator. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

CAUTION: The protection provided by air-purifying respirators is limited. Use a positive pressure air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are not known, or if concentrations exceed the protection limits of air-purifying respirator.

7. Handling and storage

Handling

Aspiration hazard if swallowed- can enter lungs and cause damage. Never siphon by mouth. Do not ingest. If ingested do not induce vomiting. When using do not eat, drink or smoke. Avoid contact with skin and clothing. Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Use only with adequate ventilation Avoid breathing vapor or mist. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling. Empty containers may contain harmful, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

Storage

Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Store and use only in equipment/containers designed for use with this product.

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Occupational exposure limits
Petroleum distillates	**ACGIH TLV (United States, 1/2006). Skin** TWA: 100 mg/m^3 8 hour(s). Form: Total hydrocarbons
Contains: naphthalene	**ACGIH TLV (United States, 1/2006).** STEL: 79 mg/m^3 15 minute(s). STEL: 15 ppm 15 minute(s). TWA: 52 mg/m^3 8 hour(s). TWA: 10 ppm 8 hour(s). **OSHA PEL (United States, 8/1997).** TWA: 50 mg/m^3 8 hour(s). TWA: 10 ppm 8 hour(s).

May also contain small quantities of proprietary performance additives.

Control Measures	Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable.
Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
Personal protection	
Eyes	Avoid contact with eyes. Safety glasses with side shields.
Skin and body	Avoid contact with skin and clothing. Wear suitable protective clothing.
Respiratory	Use only with adequate ventilation Do not breathe vapor or mist. If ventilation is inadequate, use a NIOSH certified respirator with an organic vapor cartridge and P95 particulate filter. CAUTION: The protection provided by air-purifying respirators is limited. Use a positive pressure air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are not known, or if concentrations exceed the protection limits of air-purifying respirator.
Hands	Wear gloves that cannot be penetrated by chemicals or oil. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions. Consult your supervisor or S.O.P. for special handling directions

Consult local authorities for acceptable exposure limits.

9. Physical and chemical properties

Physical state	Liquid.
Odor	Petroleum
Color	Colorless. to Various colors. (may be dyed Red., Light Green. ,Yellow.)
Heat of combustion	Not available.
Specific gravity	<1 (Water = 1)
Density	820 to 875 kg/m^3 (0.82 to 0.875 g/cm^3)
Solubility	negligible <0.1%
Viscosity	Kinematic: 1.7 to 4.1 mm^2/s (1.7 to 4.1 cSt) at 40°C

10. Stability and reactivity

Stability and reactivity	Stable under recommended storage and handling conditions (See Section: "Handling and storage").
Conditions to avoid	Keep away from heat, sparks and flame. Avoid all possible sources of ignition (spark or flame).
Incompatibility with various substances	Reactive or incompatible with the following materials: oxidizing materials, acids and alkalis. halogenated compounds.
Hazardous decomposition products	These products are carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)
Hazardous polymerization	Will not occur.

11. Toxicological information

Acute toxicity

Aspiration of this product into the lungs can cause chemical pneumonia and can be fatal. Aspiration into the lungs can occur while vomiting after ingestion of this product. Do not siphon by mouth.

Chronic toxicity

Carcinogenic effects

Contains material which may cause cancer.
Risk of cancer depends on duration and level of exposure.
Classified 2B (Possible for human.) by IARC: [naphthalene]
Classified 2 (Reasonably Anticipated To Be Human Carcinogens.) by NTP: [naphthalene]

Other chronic toxicity data

Middle distillate: From skin-painting studies of petroleum distillates of similar composition and distillate range, it has been shown that these types of materials often possess weak carcinogenic activity in laboratory animals. In these tests, the material is painted on the shaved backs of mice twice a week for their lifetime. The material is not washed off between applications. Therefore, there may be a potential risk of skin cancer from prolonged or repeated skin contact with this product in the absence of good personal hygiene. This particular product has not been tested for carcinogenic activity, but we have chosen to be cautious in light of the findings with other distillate streams.

Occasional skin contact with this product is not expected to have serious effects, but good personal hygiene should be practiced and repeated skin contact avoided. This product can also be expected to produce skin irritation upon prolonged or repeated skin contact. Personal hygiene measures taken to prevent skin irritation are expected to be adequate to prevent risk of skin cancer.

Diesel exhaust particulates have been classified by the National Toxicological Program (NTP) to be a reasonably anticipated human carcinogen. Exposure should be minimized to reduce potential risk.

Naphthalene has been reported to cause developmental toxicity in mice after oral exposure to relatively high dose levels, but developmental toxicity was not observed in NTP (National Toxicology Program) sponsored studies in rats and rabbits. Ingestion or inhalation of naphthalene can result in hemolysis and other blood abnormalities, and individuals (and infants) deficient in glucose-6-phosphate dehydrogenase may be especially susceptible to these effects. Inhalation of naphthalene may cause headache and nausea. Airborne exposure can result in eye irritation. Naphthalene exposure has been associated with cataracts in animals and humans.

12. Ecological information

Ecotoxicity

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

Mobility

Spillages may penetrate the soil causing ground water contamination.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Other ecological information

Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

13. Disposal considerations

Waste information

Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities. Dispose of in accordance with all applicable local and national regulations.

Consult your local or regional authorities.

14. Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	NA1993	Diesel Fuel	Combustible liquid.	III	-----	**Reportable quantity** 100 lbs. (45.36 kg)
TDG Classification	UN1202	Gas oil	3	III		Not determined.
IMDG Classification	UN1202	Gas oil	3	III		Not determined.
IATA Classification	UN1202	Gas oil	3	III		Not determined.

15. Regulatory information

U.S. Federal regulations

US INVENTORY (TSCA): In compliance.

TSCA 12(b) one-time export notification:: naphthalene

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA 311/312 MSDS distribution - chemical inventory - hazard identification: DIESEL FUEL NO. 2: Fire hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

SARA 313

Form R - Reporting requirements

Supplier notification

Product name	CAS number	Concentration
naphthalene	91-20-3	1 - 3
naphthalene	91-20-3	1 - 3

CERCLA Sections 102a/103 Hazardous Substances (40 CFR Part 302.4):: o-Xylene: 1000 lbs. (453.6 kg); naphthalene: 100 lbs. (45.36 kg); xylene: 100 lbs. (45.36 kg); Ethylbenzene: 1000 lbs. (453.6 kg); Xylene: 100 lbs. (45.36 kg); Cumene: 5000 lbs. (2268 kg); xylene: 100 lbs. (45.36 kg);

State regulations

Massachusetts RTK:Straight run kerosine; 1,2,4-Trimethylbenzene
New Jersey:Straight run kerosine; 1,2,4-Trimethylbenzene
Pennsylvania RTK:Straight run kerosine (generic environmental hazard); 1,2,4-Trimethylbenzene (environmental hazard, generic environmental hazard)

WARNING: This product contains a chemical known to the State of California to cause cancer. ; Ethylbenzene; naphthalene

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
Toluene
WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.
Benzene

Prop 65 chemicals will result under certain conditions from the use of this material. For example, burning fuels produces combustion products including diesel exhaust, a Prop 65 carcinogen, and carbon monoxide, a Prop 65 reproductive toxin.

Inventories

AUSTRALIAN INVENTORY (AICS): Not determined.

CANADA INVENTORY (DSL): In compliance.

CHINA INVENTORY (IECS): Not determined.

EC INVENTORY (EINECS/ELINCS): Not determined.

JAPAN INVENTORY (ENCS): Not determined.

KOREA INVENTORY (ECL): Not determined.

PHILIPPINE INVENTORY (PICCS): Not determined.

16. Other information

Label requirements

WARNING!

COMBUSTIBLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.
HARMFUL IF SWALLOWED.
ASPIRATION HAZARD.
HARMFUL OR FATAL IF LIQUID IS ASPIRATED INTO LUNGS.
CAUSES SKIN IRRITATION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.
INHALATION CAUSES HEADACHES, DIZZINESS, DROWSINESS, AND NAUSEA, AND MAY LEAD TO UNCONSCIOUSNESS.

HMIS® Rating :

Health	**0**
Flammability	**2**
Physical Hazard	**0**
Personal protection	**X**

National Fire Protection Association (U.S.A.)

History

Date of issue 08/29/2006.

Date of previous issue 08/29/2006.

Prepared by Product Stewardship

Notice to reader

NOTICE : This Material Safety Data Sheet is based upon data considered to be accurate at the time of its preparation. Despite our efforts, it may not be up to date or applicable to the circumstances of any particular case. We are not responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product.

ATTACHMENT 5
Site Safety and Health Officer Resume

Robert Janosy, PG

Job Title(s):
Senior Geologist, Site Superintendent/ Site Safety and Health Officer

Education:
- MS, Geological Sciences, The Ohio State University, 1994
- BS, Geological Sciences, The Ohio State University, 1991

Certifications/Training:
- Professional Geologist (CA)
- Qualified SWPPP Developer and Practitioner (CA)
- OSHA 40 hr HAZWOPER
- OSHA 8 hr HAZWOPER Refresher
- OSHA 30 hr Construction
- OSHA 10 hr Construction
- Trenching and Excavation
- OSHA 8 hr Supervisor
- First Aid/CPR/AED
- Bloodborne Pathogens

Qualifications:
- Over 25 years of experience conducting geologic and hydrogeologic research and field investigations
- Over 20 years experience performing remedial investigations and corrective/remedial actions
- Over 15 years of project management experience on US Navy contracts
- Extensive history of working on US DOD sites, including former Alameda NAS, former Hamilton Army Airfield, former Hunters Point Naval Shipyard, Moffett Field, MCB Camp Pendleton, MCAGCC Twentynine Palms, NAS Fallon, Dover AFB, Aberdeen Proving Grounds

Selected Experience:

Project Manager, Resource and Conservation and Recovery Act (RCRA) Facility Assessment (RFA) Program Cleanup, Marine Corps Base (MCB) Camp Pendleton, CA (2008 –Present)
Project Manager and Technical Lead for MCB Camp Pendleton RFA program consisting of 101 sites. Responsible for closure of 97 RFA sites since 2008. Developed a screening process to determine appropriate course of action for each site. Negotiated with regulatory agency on behalf of U.S. Navy clients to administratively close 59 RFA sites and transfer 10 sites to other cleanup programs without performing field investigations, resulting in a $10M savings to the U.S. Navy. As Lead Geologist, led field investigations at remaining 38 RFA sites that resulted in site closure.

Project Manager, Installation Restoration (IR) Program Cleanup, MCB Camp Pendleton, CA (2008 – Present)
Project Manager and Technical Lead for various IR sites. Projects included producing a Remedial Action Completion Report (RACR) which resulted in a No Further Action (NFA) determination at a former burn ash site, an Explanation of Significant Difference (ESD) to change land use restrictions of a landfill cap, development of an RI work plan, and feasibility study. Led or assisted in field activities consisting of comprehensive soil and groundwater investigations, soil removal actions, and installation of remediation systems. Interacted with Federal Facilities Agreement (FFA) team through presentation of project results and responding to regulatory comments on prepared documents.

Project Manager, IR Program Cleanup, Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, CA (2008 – 2015)
Implemented remedial actions and site closure at multiple IR sites at MCAGCC Twentynine Palms on behalf of the Natural Resources and Environmental Affairs (NREA) office. Included technical lead on soil vapor extraction and groundwater monitoring activities, field lead on soil and soil gas sampling efforts, writing closure report documents, performing screening level risk assessments, addressing Federal and State regulatory agency comments on submitted reports.

Task Manager/Site Superintendent, Midwest Regional Carbon Sequestration Partnership (MRCSP) (2005-2008)
Task manager for evaluating the feasibility of subsurface injection of carbon dioxide (carbon sequestration) at three coal-burning power plant sites located in WV, OH, and MI funded by the U.S. Department of Energy's (DOE) National Energy Technology Laboratory (NETL), American Electric Power (AEP), British Petroleum (BP), Ohio Coal Development Office (OCDC), and Schlumberger. Planned and oversaw the implementation of an 11-mile 2-dimensional seismic survey in OH and WV. The survey was essential for characterization of the candidate test well site to determine overall site geology, structure features, and reservoirs properties. As site superintendent, oversaw the drilling of a 2,800 m. deep test well at the site. Also assisted with the design and permitting of the well.

Ben Headington, PMP

Job Title(s):
Site Superintendent/ Alt. Site Safety and Health Offiicer

Education:
- BA, Business Communications, Ohio State University, 2003

Certifications/Training:
- Project Management Professional (PMP) certification
- OSHA 40 hr HAZWOPER
- OSHA 30 hr Construction
- OSHA 10 hr Construction
- OSHA 8 hr Supervisor
- First Aid/CPR

Qualifications:
- Over 15 years of experience with remedial investigation, remedial system design and construction, system operation and optimization
- Over 10 years of experience involving the management and execution of environmental projects, specifically at National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL) Pasadena at JPL, supporting NASA
- 5 years of drinking water treatment system construction, operation, and testing experience
- Extensive US Navy environmental restoration experience, specifically MCB Camp Pendleton, NASA-JPL, Former MCAS Tustin, Former Long Beach Naval Shipyard and MCB Twenty Nine Palms

Selected Experience:

Project Manager/Site Superintendent, JPL CERCLA Cleanup, NASA (2006 – 2013) OU-3 Monk Hill Treatment System (MHTS)
Project Manager/Site Superintendent providing onsite technical leadership, management, and support during the construction, startup and testing, and California Department of Public Health (CDPH) permitting of a 7,000 gpm drinking water treatment system (ion exchange and granular activated carbon). Provided oversight of the rehabilitation of four City of Pasadena drinking-water supply wells with flow rates between 1,400 to 2,200 gpm. Responsible for schedules, budgets, safety, permit compliance, and deliverables. Proactively managed staff and subcontractors. The project addresses elevated perchlorate and VOC groundwater contamination within the four MHTS wells which is considered by the CDPH to be an "extremely impaired" drinking water source.

Project Manager, JPL CERCLA Cleanup, NASA (2002 –2015) OU-1 Source Area Treatment System
Project Manager providing technical support and leadership for the operation of the 300 gpm groundwater bioremediation treatment system (fluidized bed reactor) which includes three extraction and three injection wells. Provided system design and construction oversight support. Provided support of 12 rehabilitation events, and designed one of the newest injection well at the NASA-JPL facility. Successful operation and maintenance of the OU-1 treatment facility has resulted in further reduction in source area contamination. The project addresses perchlorate and VOC groundwater contamination.

Project Manager, JPL CERCLA Cleanup, NASA (2006 -2015) Lincoln Avenue Water Company (LAWC) Drinking Water Treatment System
Project Manager supporting Annual CERCLA reporting requirements for the LAWC treatment facility. Supported LAWC staff during the backwash of virgin granular activated carbon (GAC) media used for NASA funded drinking water treatment system (ion exchange and GAC). Included the installation of temporary pipeline, containment tanks, re-configuration of filtration system, field water parameter monitoring during backwash, and the collection of samples for laboratory analyses. Laboratory results used to support water purveyor's application and issuance of National Pollutant Discharge Elimination System (NPDES) permit.

Project Manager/Site Superintendent, JPL CERCLA Cleanup, NASA (2007) OU-1 Source Area Treatment System Expansion (Conveyance Pipeline Installation)
Project Manager/Site Superintendent providing oversight during installation of two new treatment wells and hundreds of feet of conveyance pipelines. Mr. Headington assisted with designing the injection/extraction well and all associated conveyance pipelines. The wells are components of the Phase II expanded treatability study system designed to address source area chemicals of interest (perchlorate and VOCs) in the on-facility groundwater and increase the treatment rate to 300 gpm.

ATTACHMENT 6
Personnel Certifications

EMILCOTT/DGA

HEALTH, SAFETY AND ENVIRONMENTAL TRAINING PROGRAM

THIS CERTIFIES THAT

Robert Janosy

HAS SUCCESSFULLY COMPLETED

8-Hour Supervisor Training Course for Hazardous Waste Operations CFR 1910.120

DATE April 19, 2000 LOCATION Battelle Memorial Institute

Dianne Grote Adams

Dianne Grote Adams, CIH, CSP *Course Director*

EMILCOTT ASSOCIATES, INC.
EMILCOTT - DGA, Inc.

HEALTH, SAFETY AND ENVIRONMENTAL TRAINING PROGRAM

This Certifies That

Robert J. Janosy

Has Successfully Completed

40 Hour Health and Safety Training Course for Hazardous Waste Operations

Date **June 15, 1995** Location **Westerville, Ohio**

5.0 ABIH CM Point
4.0 CEU Point

Dianne Grote Adams

Dianne Grote Adams, CIH Course Director

OSHA Occupational Safety and Health Administration

36-600707675

This card acknowledges that the recipient has successfully completed a 30-hour Occupational Safety and Health Training Course in

Construction Safety and Health

ROBERT JANOSY

Rick C. Knight

(Trainer name – print or type)

3/1/2010

(Course end date)

Certificate of Completion

Robert Janosy
has completed requirements for

Adult First Aid/CPR/AED

conducted by
American Red Cross

Date completed: 03/20/2015
Validity Period: 2 Years

Certificate ID: 0WM82F

Scan code or visit:
redcross.org/confirm

OSHA 001687144

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

Robert Janosy

has successfully completed a 10-hour Occupational Safety and Health Training Course in

Construction Safety & Health

R N Culpepper — 2/08

(Trainer) (Date)

Certificate of Completion

Presented to

Robert Janosy

of

Battelle Memorial Institute

for successful completion of

OSHA 10-Hour Online Course for Construction

on

February 10, 2008

Supervisor

Date

Safex

Health, Safety and Environmental Training Program

This Certifies That

Robert Janosy

Has Successfully Completed

Trenching and Excavation Training

Date Oct 22 2007 **Location** Westerville, OH

Dianne Grote Adams

Dianne Grote Adams, CIH, Course Director

Certificate of Completion

This is to certify that

Robert Janosy

Has completed

HAZWOPER 8 hr Annual Refresher

360training.com, Inc. is authorized by IACET to offer 0.8 **CEUs for this program.**

Completion Date: 02/16/2016

Course Duration: 8.0

ISHM Institute for Safety and Health Management

ASU Arizona State University

ACCREDITED IACET PROVIDER

360training.com

360training.com ♦ 13801 Burnet Rd., Suite 100 ♦ Austin, TX 78727 ♦ 800-442-1149 ♦ www.360trainingsupport.com

(CUT HERE)

This is your pocket card which may be used for proof of completion of your training. This training is intended to provide supervisor awareness for recognizing and preventing hazards on a construction site. Workers must receive additional training as required for the specific hazards of their job or federal, state, and local requirements.

360training.com, Inc. is accredited by the International Association for Continuing Education and Training (IACET) and is authorized to issue the IACET CEU.

OSHAcampus.com is a trademark of 360training.com, Inc.

Questions? Visit www.oshacampus.com

ISHM

ASU Arizona State University

safety@oshacampus.com
1-800-442-1149

(FOLD)

360training.com

ASU Arizona State University

ISHM

This certifies that the person named below successfully completed a

Robert Janosy

HAZWOPER 8 hr Annual Refresher

02/16/2016
Completed

=. Marie Athey, OHST
Trainer Name

Certificate of Completion

This is to certify that

Robert Janosy

has completed

Bloodborne Pathogens (GI)

Completion Date 02/16/2016

Course Duration 1.0

360training.com™

360training.com ♦ 13801 Burnet Rd., Suite 100 ♦ Austin, TX 78727 ♦ 800-442-1149 ♦ www.360trainingsupport.com

COLUMBUS STATE COMMUNITY COLLEGE

ENVIRONMENTAL TECHNOLOGY

acknowledges the participation of

BENJAMIN J. HEADINGTON

in the

OSHA 40-Hour

Hazardous Waste Site Worker

Health & Safety Training

held in Columbus, OH, January 8 through March 12, 1999

Certificate #: 1024

Date of Certificate: 3/12/99

James Stratton, Chairperson
Construction Sciences Department

COLUMBUS STATE Community College

Jeff Bates, Instructor
Environmental Technology

DG Safety Services

PO Box 721245 Pinon Hills, CA 92372 Phone: 760-475-3163

This is to certify that

Ben Headington

Has satisfactorily completed

Hazardous Waste Operation & Emergency Response (8 Hour)

Hazwoper

[29CFR1910.120]

OSHA Required 8 Hour Refresher

Certified Instructor: Danielle Gregg

Date: January 16, 2015

Instructors Signature: Danielle Gregg

DG Safety Services

PO Box 721245 Pinon Hills, CA 92372 Phone: 760-475-3163

This is to certify that

Ben Headington

Has satisfactorily completed

Permit Required Confined Space (8 Hour)

Entrant &Attendant Program

[29CFR1910.146]

OSHA Required 8 Hour Course

Certified Instructor: Danielle Gregg

Date: January 15, 2015

Instructors Signature: Danielle Gregg

EFR Environmental Safety Training

PO Box 2669 Alpine, CA 91901

This is to certify that

Ben Headington

Has satisfactorily completed

Hazwoper Supervisor Training Initial (8 Hour)

Hazwoper

[29 CFR 1910.120.]

OSHA Required 8 Hour Initial

Certified Instructor: Sam Serpa

Date: October 21, 2013

Instructors Signature: Sam S. Serpa

Certificate No. 2010317

OSHA Occupational Safety and Health Administration

36-600709859

This card acknowledges that the recipient has successfully completed a 30-hour Occupational Safety and Health Training Course in

Construction Safety and Health

BEN HEADINGTON

Michael Millsap — 7/7/2010

(Trainer name – print or type) — (Course end date)

HEARTSAVER CPR AED

Heartsaver® CPR AED

American Heart Association®

Ben Headington

This card certifies that the above individual has successfully completed the objectives and skills evaluations in accordance with the curriculum of the AHA Heartsaver CPR AED Program. Optional completed modules are those **NOT** marked out:

~~Child CPR AED~~ ~~Infant CPR~~ ~~Written test~~

8/21/15 — Issue Date

8/21/17 — Recommended Renewal Date

OSHA recommends Outreach Training Courses as an orientation to occupational safety and health for workers. Participation is voluntary. Workers must receive additional training on specific hazards of their job. This course completion card does not expire.

Use or distribution of this card for fraudulent purposes, including false claims of having received training, may result in prosecution under 18 U.S.C. 1001. Potential penalties include substantial criminal fines, imprisonment up to five years, or both.

For OSHA Outreach Training Program go to "Training" at www.osha.gov

Rev. 12/2009

HEARTSAVER CPR AED

Training Center Name **INTERNATIONAL SOS** TC ID # **ZZ20605**

TC Info **JOHANNESBURG, SOUTH AFRICA** City, State ZIP TC Phone **+27 11 541 1000**

Course Location **MEDAIRE**

Instructor Name Steve Chesshir Inst. ID # 04110015695

Holder's Signature Ben Headington

 Tampering with this card will alter its appearance. 90-1813

American Heart Association

Learn and Live

Participation Certificate

Ben Headington

Has successfully participated in the general portion of the Heartsaver® Bloodborne Pathogens Online Course by the American Heart Association.

To meet OSHA regulations, you must also receive training in your employer's site-specific exposure control plan.

Ask your employer for more information about this part of your training.

SCIHUBRNFGSY	February 05, 2015
Key Number	Date Completed

2/09 KJ0663

15:54:03 GMT-0500 (EST)