ACCIDENT PREVENTION PLAN
PARCEL 3 GROUNDWATER RCRA FACILITY INVESTIGATION

FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

CONTRACT NUMBER W912PP-15-C-0014

Prepared For:

United States Army Corps of Engineers
Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109

Prepared By:

Sundance Consulting, Inc.
8210 Louisiana Boulevard NE, Suite C
Albuquerque, New Mexico 87113

October 2015

ACCIDENT PREVENTION PLAN ACKNOWLEDGEMENT

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

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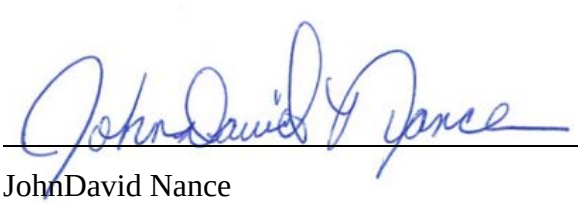
LIST OF ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analysis
AOC	Area of Concern
APP	Accident Prevention Plan
CAMU	Corrective Actions Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Contracting Officer
COR	Contracting Officer's Representative
CPR	Cardiopulmonary Resuscitation
EM	Engineer Manual
FTL	Field Team Leader
FWDA	Fort Wingate Depot Activity
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
IDW	Investigation-Derived Waste
MEC	Munitions and Explosives of Concern
NIOSH	National Institute for Occupational Safety and Health
OB/OD	Open Burn/Open Detonation
OSHA	Occupational Safety and Health Administration
PM	Project Manager
PPE	Personal protective equipment
PWS	Project Work Statement
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SDS	Safety Data Sheet
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
Sundance	Sundance Consulting, Inc.
SWMU	Solid Waste Management Unit
U.S.	United States
USACE	United States Army Corps of Engineers

SIGNATURE SHEET

ACCIDENT PREVENTION PLAN
PARCEL 3 GROUNDWATER RCRA FACILITY INVESTIGATION
FORT WINGATE DEPOT ACTIVITY

McKinley County, New Mexico



October 12, 2015

JohnDavid Nance — Date

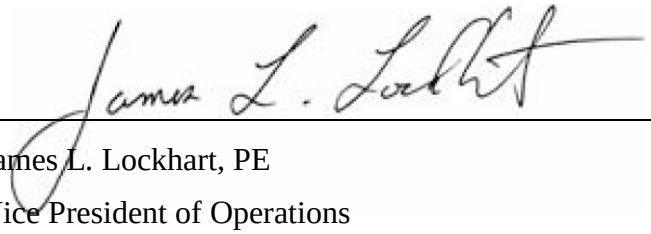
Project Manager

October 12, 2015

Ken Vernon, PG — Date

Program Manager

CERTIFICATION



October 12, 2015

James L. Lockhart, PE — Date

Vice President of Operations

1.0 BACKGROUND INFORMATION

This Accident Prevention Plan (APP) has been prepared for the Parcel 3 Groundwater Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) project at Fort Wingate Depot Activity (FWDA). The purpose of this APP is to establish safety and health procedures and practices, and identify equipment to be implemented to protect affected personnel from the potential hazards associated with the field activities to be performed at the project site.

The APP assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted during the field work for groundwater monitoring activities at the FWDA. This APP has been prepared in accordance with the following:

- Engineer Manual (EM) 385-1-1, Safety and Health Requirements Manual (USACE, 2014).
- 29 Code of Federal Regulations (CFR) 1910.120, Hazardous Waste, Operations and Emergency Response.
- 29 CFR 1926.65, Hazardous Waste Operations and Emergency Response (HAZWOPER).

1.1 CONTRACTOR

Sundance Consulting, Inc. (Sundance)
8210 Louisiana Blvd. NE, Suite C
Albuquerque, New Mexico 87113

1.2 CONTRACT NUMBER

Work is being conducted under Contract No. W912PP-15-C-0014.

1.3 PROJECT NAME

The project title is "Parcel 3 Groundwater RFI, Fort Wingate Depot Activity, McKinley County, New Mexico".

1.4 PROJECT DESCRIPTION AND DESCRIPTION OF WORK

The FWDA currently occupies approximately 24 square miles (15,277 acres) of land in western New Mexico in McKinley County (Figure 1-1). The FWDA is located approximately seven miles east of Gallup and about 130 miles west of Albuquerque. The main entrance to the FWDA is on United States (U.S.) Highway 66, west from Exit 33 off Interstate 40. The Facility is surrounded by federally owned and administered lands, including national forest lands, Zuni tribal lands, and Navajo tribal lands. North and west of the Facility are Navajo trust and Native American allotted lands, to the east are lands that are administered by the Bureau of Indian Affairs, and to the south and southeast is the undeveloped Cibola National Forest.

Parcel 3 is located in the southern portion of FWDA and consists of the following areas:

- Solid Waste Management Unit (SWMU) 15 – Old Demolition Area
- SWMU 33 – Waste Pile KP1

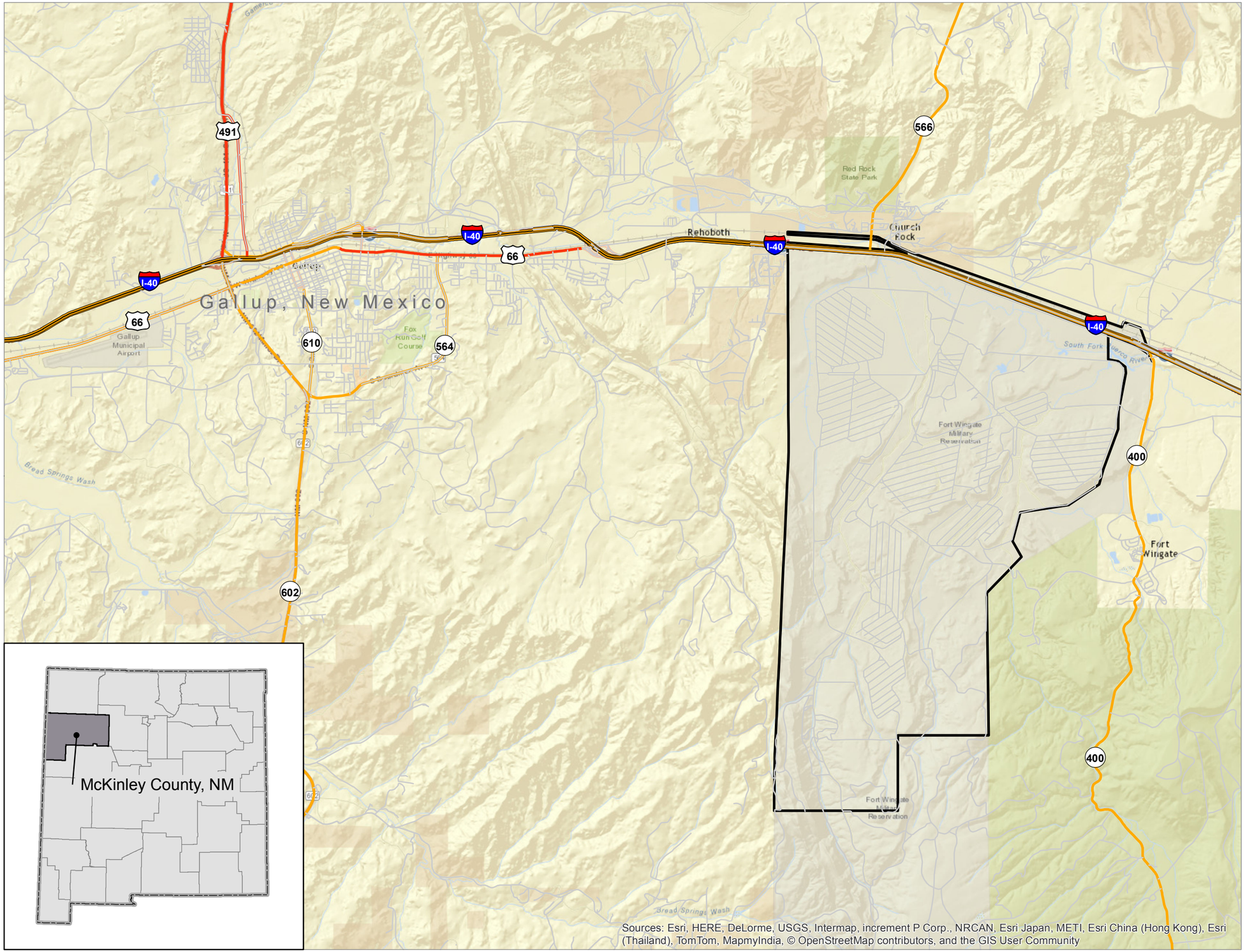
- SWMU 74 – Area 16 or Site 16 (proposed burning ground)
- Area of Concern (AOC) 89
- AOC 90
- AOC 91
- AOC 92
- Open Burn/Open Detonation (OB/OD) Unit – inactive OB/OD unit includes the Burning Ground Area, twelve Current Detonation Craters, and ten Current Residue Piles
- Corrective Actions Management Unit (CAMU) – active OB/OD treatment unit

The objective of this APP is to present a comprehensive plan to control safety and health hazards that may be associated with the performance of the Groundwater RFI at Parcel 3.

The purpose of this project is to assess groundwater quality in the OB/OD area SWMUs, AOCs, and the CAMU at the installation, implementation of the field investigation to achieve this objective, and preparation of an RFI report.

Field activities covered by this APP include the following:

- Munitions and Explosives of Concern (MEC) avoidance.
- Drilling temporary and permanent wells.
- Sampling groundwater.
- Sampling subsurface soil.
- Managing investigation-derived waste (IDW).



Legend

- FWDA Site Boundary
- Interstate
- US Highway
- State Highway
- County, Arterial Road

Notes

FWDA = Fort Wingate Depot Activity
US = United States
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation

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WGS 1984

Updated:
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Sundance Consulting Inc.

Figure 1-1

SITE LOCATION MAP

FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Author: Document Path: C:\Users\bdavis\Documents\ArcGIS\FortWingate\August2015Work\SiteLoc.mxd Document Name: SiteLoc

1.5 PHASES OF WORK AND ASSOCIATED HAZARDOUS ACTIVITIES REQUIRING ACTIVITY HAZARD ANALYSES

During each phase of work, Sundance personnel and subcontractor personnel will be involved with activities that could potentially expose them to chemical, physical, and biological hazards. Sundance will analyze these hazardous activities to identify controls that will protect the safety and health of all personnel entering the project site. Sundance will prepare Activity Hazard Analyses (AHAs) before beginning each work activity, as required by EM 385-1-1. The field tasks associated with the RFI activities include:

1. Mobilization and demobilization
2. MEC avoidance using a magnetometer
3. Drilling
4. Groundwater sampling
5. Subsurface soil sampling
6. Disposal of IDW

AHAs will be prepared for the following activities:

1. Mobilization and demobilization
2. MEC avoidance using a magnetometer
3. Use of vehicles
4. Fueling operations
5. IDW handling
6. Groundwater sampling
7. Soil sampling

Additional information on each activity can be found in Section 2.0 of Attachment 1, Site Safety and Health Plan (SSHP).

2.0 STATEMENT OF SAFETY AND HEALTH POLICY

Sundance is committed to a safe, healthy, and productive work environment for all its employees, clients, subcontractors, and site visitors. Sundance embraces and practices the principles of the United States Army Corps of Engineers (USACE)–Albuquerque District's "Zero Accident, Zero Tolerance" policy and these are implemented in this APP. Sundance's Senior Management, including President and Founder, September Myres, takes a personal and active interest in maintaining safety as a top priority. Sundance understands that a proactive and systematic Safety and Health Program is essential to the success of every project.

The objectives of Sundance's Safety and Health Program are to ensure:

- Sound safety and health practices and conditions necessary for the protection of the health and welfare of employees, clients, and visitors.
- Compliance with federal, state, and USACE safety and health regulations and standards.

- Effective safety work practices necessary for protection of property.

This APP and supplemental plans (SSHP, Attachment 1) have been developed to meet these objectives.

3.0 RESPONSIBILITIES AND LINES OF AUTHORITY

3.1 STATEMENT OF EMPLOYER RESPONSIBILITY

Sundance is ultimately responsible for the implementation of the Safety and Health Program, for its effectiveness and improvement, and for providing the safeguards required for ensuring safe jobsite conditions.

3.2 IDENTIFICATION AND ACCOUNTABILITY OF PERSONNEL RESPONSIBLE FOR SAFETY AT THE CORPORATE LEVEL

All personnel are responsible for continuous adherence to this APP and safety and health procedures during the performance of their work. No person may work in a manner that conflicts with the intent of or the inherent safety and environmental precautions expressed in these procedures. All onsite personnel will be trained in accordance with this document.

Safety responsibilities, accountability, and lines of authority are discussed in Section 13.0 of the SSHP (Attachment 1). The Sundance Vice President of Operations, Project Manager (PM), Field Team Leader (FTL), Site Safety and Health Officer (SSHO), and the Health and Safety Manager (HSM) are responsible for formulating and enforcing health and safety requirements and implementing the SSHP. Figure 3-1 shows the lines of authority organizational matrix.

3.2.1 Vice President of Operations

The Sundance Vice President of Operations is responsible for the Corporate Health and Safety Program. The Vice President of Operations will provide strong leadership and a commitment to safety throughout all phases of the project and will ensure the following:

- That a company-wide Safety and Health Program is established and administered, and is designed to ensure compliance with Occupational Safety and Health Administration (OSHA) regulations, federal and state regulations, client-specific requirements, and safe work practices.
- That the Safety and Health Program progress is reviewed and significant problems and accomplishments are periodically reported to management.
- That annual evaluations of the effectiveness of the Safety and Health Program are conducted, and recommended changes are submitted to the President for review and comment.
- That the policies and objectives presented in the APP remain the foremost company priority and that these requirements are communicated to all employees.
- That systems, procedures, and allocation of resources meet the demands expected to fully implement the APP.

- That each PM is held accountable for a safe and healthy work environment on their assigned projects.

3.2.2 Project Manager

The PM is responsible for:

- Ensuring all team members (including subcontractors) have received the required safety and health training and medical examinations, and are fit for duty.
- Ensuring all team members (including subcontractors) understand that compliance with the APP requirements is mandatory.
- Ensuring the implementation of any job or site-specific safety or health requirements specified by clients.
- Promoting "Safety First" for all activities associated with the project.
- Monitoring and auditing field operations related to accident prevention performance.
- Establishing adequate safety interface between the employees on the project, thus enabling them to individually and collectively function in a safe, productive, and harmonious manner.
- Auditing environment, health, and safety on their projects including auditing employee and subcontractor safety performance for compliance with requirements of this APP.

3.2.3 Site Health and Safety Officer

The SSHO will perform safety and occupational health management, surveillance, inspections, and safety enforcement for the contractor. In addition to duties required in EM 385-1-1, the SSHO will perform the following:

- Conduct regular inspections of the work area, identify hazards or areas of environmental non-compliance, and take the appropriate action to correct the identified hazards.
- Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution and post a list of safety and health deficiencies on the safety bulletin board.
- Maintain applicable safety reference material on the job site.
- Ensure that planning has been accomplished for the work to be performed in a safe manner prior to starting a work activity.
- Assure that each AHA is completed accurately and communicated to the workers for each activity.
- Implement and enforce approved APP and AHAs.
- Stop any operations that threaten the safety or health of the team or surrounding populace, or that may cause significant adverse impact to the environment.

- Maintain a list of hazardous chemicals onsite along with their Safety Data Sheets (SDSs).
- Ensure that the correct tools and equipment are provided for the job. Tools and equipment must be free of defects and must carry current certifications as required.
- Set priorities to promote safe work activities and emphasize, communicate, and recognize improving safety.
- Provide leadership to improve all processes and achieve a safe and healthy workplace.
- Encourage improvement of safety each day in every work activity.
- Lead by example.

3.2.4 Field Team Leader/Alternate Person in Charge

The FTL/Alternate Person in Charge is responsible for:

- Ensuring all team members (including subcontractors) have received the required safety and health training and medical examinations, and are fit for duty.
- Ensuring all team members (including subcontractors) understand that compliance with the APP requirements is mandatory.
- Ensuring the implementation of any job or site-specific safety or health requirements specified by clients.
- Promoting a “Safety First” policy for all activities associated with the project.
- Monitoring and auditing field operations related to accident prevention performance
- Establishing an adequate safety interface between the employees on the project, thus enabling them to individually and collectively function in a safe, productive, and harmonious manner.
- Auditing health and safety on their projects including auditing employee and subcontractor safety performance for compliance with requirements of this APP.

3.2.5 Health and Safety Manager

The HSM is responsible for:

- Coordinating Sundance’s Safety and Health Program with the Vice President of Operations.
- Arranging the required safety and health training for all workers.
- Providing safety and health training to employees, as necessary.
- Ensuring that assigned safety and monitoring equipment is properly used, calibrated, and maintained.
- Assisting PMs, FTLs, and SSHOs with the investigation of accidents and near misses, and providing copies of reports to the Vice President of Operations.

- Ensuring that employees identified as requiring medical surveillance per OSHA regulations (hazardous waste operations, lead, asbestos, benzene, etc.) are examined annually or biennially, as required by the Sundance Medical Monitoring Program.
- Ensuring that air sampling or air monitoring is properly conducted for all appropriate field operations.
- Writing or reviewing site-specific safety, health, and emergency response plans.

3.2.6 All Employees

Employees are accountable for:

- Working in a safe manner at all times.
- Learning and abiding by safety rules and procedures that are applicable to their work tasks and reporting substandard practices or conditions to their supervisor.
    - Team members must participate in the elimination of hazards.
- Reporting near-misses, accidents, and injuries to their supervisor, as quickly as possible.
    - Team members must be made aware of the location of medical equipment and other emergency equipment and their proper use.
- Assuming responsibility for correcting unsafe acts and conditions within their area of responsibility.
- Knowing that any employee who jeopardizes their safety and health and/or the safety and health of others will be subject to disciplinary action, including termination or removal from the project.

3.3 LINES OF AUTHORITY

Table 3-1 and Figure 3-1 contain the project personnel, their involvement on the project, the organization these individuals represent, and contact information for these individuals.

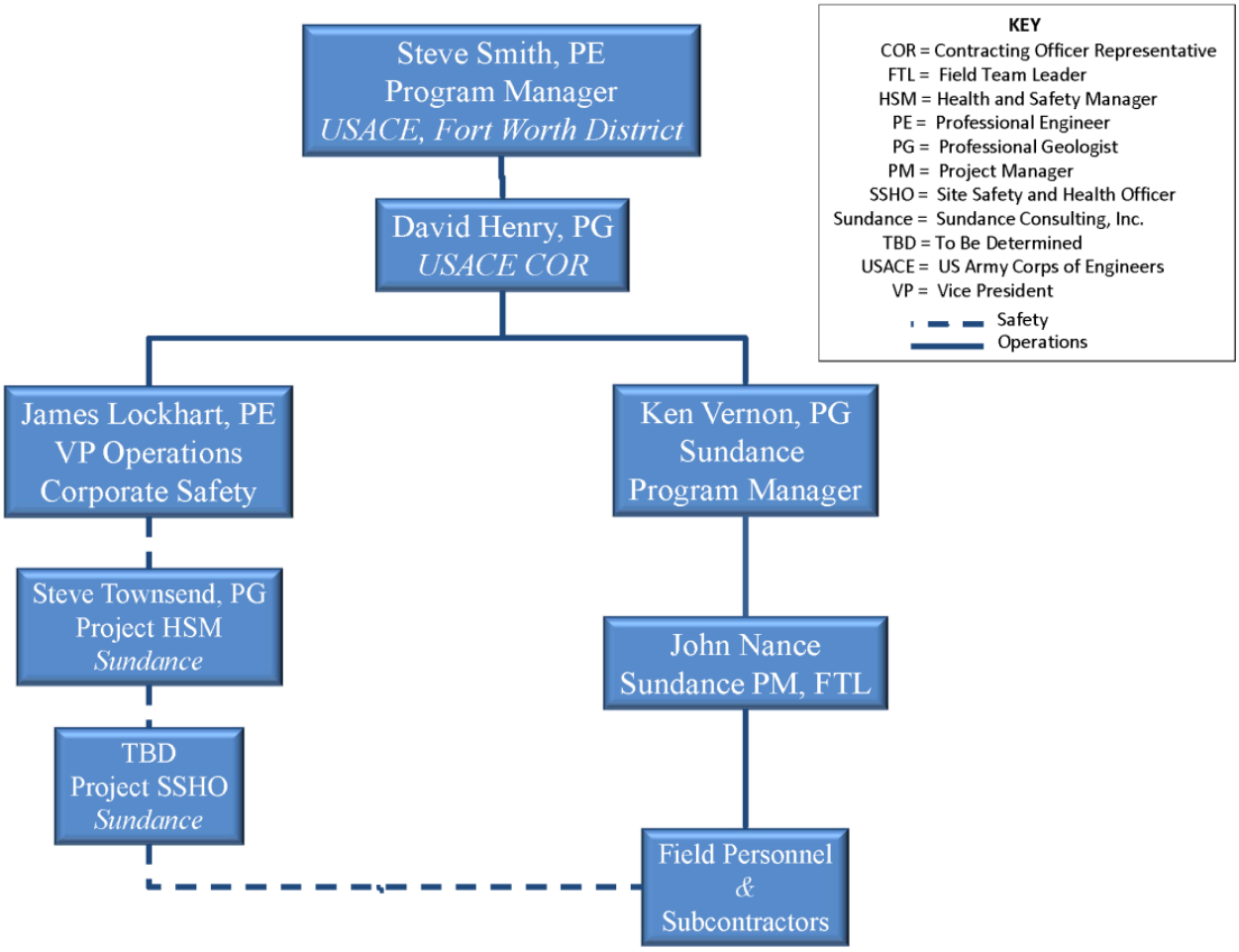
3.4 ONSITE COMPETENT PERSON REQUIREMENTS

At no time will site operations be conducted without the presence of a designated "Competent Person" as defined in Appendix Q of USACE EM 385-1-1 (USACE, 2014), nor will any task be performed without that Competent Person's presence or written approval. The competent and qualified persons to oversee all tasks being performed during this project include the PM, FTL, and SSHO.

Table 3-1: Project Contact Information

Name	Organization/Role	Telephone	Cell Number	E-mail
Steve Smith, PE	USACE–Fort Worth District, Program Manager	817.886.1879	---	steve.w.smith@usace.army.mil
David Henry	USACE–Albuquerque District PM/COR	505.342.3139	505.200.1075	david.w.henry@usace.army.mil
Angela Lane	USACE–Fort Worth District, District Project Chemist	817.886.1824	---	angela.m.lane@usace.army.mil
Ken Vernon, PG	Sundance–FWDA Program Manager	505.835.7660	951.317.5236	kvernon@sundance-inc.net
John Nance	Sundance–Project Manager and Field Team Leader	505.835.7660	505.321.7260	jnance@sundance-inc.net
James Lockhart, PE	Sundance–Vice President of Operations	208.233.2929	208.241.7805	jlockhart@sundance-inc.net
Steve Townsend, PG	Sundance–Senior Program Manager, and Health and Safety Manager	505.835.7660	616.560.0295	stownsend@sundance-inc.net

Figure 3-1: Lines of Authority – Sundance Corporate and Site Activities



4.0 SUBCONTRACTORS AND SUPPLIERS

4.1 IDENTIFICATION OF SUBCONTRACTORS

Subcontractors currently identified to assist in implementation of the project include:

- Cascade Drilling, L.P. (Drilling)
- CH2M Hill (Data Validation)
- TestAmerica (Lab Analysis)
- Silent Hawk Environmental, LLC (UXO Support)

4.2 MEASURES OF CONTROLLING AND COORDINATING SUBCONTRACTORS

The Sundance PM is responsibile for overseeing the contract, including overseeing work performed by the identified subcontractors, as well as other subcontractors required during project execution. Day-to-day management of subcontractors will be performed by the appropriate level of management—whether the PM or the FTL for a particular field activity.

All subcontractors are expected to perform to the USACE Albuquerque District and Sundance standards. Subcontract agreements will contain appropriate "flow-downs" from Sundance's contract with USACE Albuquerque District. Identified subcontractors and other subcontractors will be required to have quality control and safety programs that meet or exceed the requirements of the project. Subcontractors who do not produce quality technical products or do not comply with safety and health, budgetary, or schedule requirements will be required to promptly develop, submit, and adhere to a corrective action plan. Sundance will monitor and aid the subcontractor in getting back on track, but will not jeopardize the project's success with non-performing or adversarial subcontractors.

4.3 SAFETY RESPONSIBILITIES OF SUBCONTRACTORS

Subcontractors providing onsite services are required to review and abide by this APP and any applicable supplemental plans. Subcontractors providing offsite support, such as laboratory services, will abide by their own corporate safety program(s).

Onsite subcontractor personnel are required to attend a Sundance daily safety meeting to discuss operations and safety issues. Subcontractors will submit AHAs for their work activities to the PM or FTL prior to the commencement of these activities. Any incidents involving subcontractor employees will be immediately reported to the PM and SSHO. A copy of the subcontractor's injury/illness report will be submitted to the Sundance PM for submittal to the USACE Contracting Officer/Contracting Officer's Representative (CO/COR) within 24 hours of the incident.

Subcontractors are required to read and sign the SSHP and comply with all requirements of this APP. Contractors not in compliance are at risk of immediate removal from the project site.

5.0 SAFETY INDOCTRINATION TRAINING

Sundance or subcontractor employees performing work at the project site will receive site-specific safety indoctrination training prior to the commencement of any field activities. The PM, FTL, or SSHO will provide this training, as applicable.

Sundance will accomplish this by ensuring that all personnel entering the site have received the appropriate OSHA and site-specific training prior to participation in site activities. Any OSHA-required training will be conducted prior to site mobilization. Site-specific training will be held at the time of site mobilization and will be reinforced during the daily safety briefings, to which site workers are required to attend.

5.1 LIST OF SUBJECTS TO BE DISCUSSED DURING THE SITE SAFETY INDOCTRINATION TRAINING

The following topics will be included within the site-specific training:

- Scope of work.
- Site conditions.
- Details of APP/SSHP.
- Employee rights and responsibilities.
- Sequence of work events.
- Safe use of field equipment.
- Potential safety issues for the site.
- Safety staff and lines of authority.
- Safe work practices.
- Required personal protective equipment (PPE).
- Known contaminants.
- Proper lifting techniques.
- Site communications.
- Chemical, physical, and biological hazards that may be encountered onsite.
- Measures and procedures for controlling site hazards.
- Handling, transportation, and storage of hazardous materials.
- Emergency response and contingency plan.
- Emergency procedures for cleanup of chemical spills.
- Evacuation routes.
- Rules and regulations for vehicle use.
- Hazard Communication per 29 CFR 1910.1200.
- Emergency notifications.

- Directions to the nearest hospital or medical facility.

5.2 LIST OF MANDATORY TRAINING AND CERTIFICATION APPLICABLE TO THIS PROJECT

In accordance with HAZWOPER and USACE EM 385-1-1 Section 28, HAZWOPER mandatory training and certifications applicable to this project include at a minimum:

- 40-hour HAZWOPER training in accordance with 29 CFR 1910.120 (e).
- 8-hour annual HAZWOPER refresher training in accordance with 29 CFR 1910.120 (e).
- Three (3) days of field experience under the direct supervision of a trained, experienced supervisor 29 CFR 1910.120 (e) (completed after the initial 40-hour training course).
- First aid/cardiopulmonary resuscitation (CPR) (minimum of two personnel onsite).

Sundance will make current certifications for Sundance personnel accessible via a file kept onsite for the project duration; in addition, Sundance will maintain this file at the corporate office. Sundance will not permit individuals without the appropriate training and certifications to work onsite.

Hazard Communication

Sundance employees and subcontractors who are performing work involving the handling of hazardous materials will receive Hazard Communication training. It is important that employees have access to and understand the technical information regarding the chemical hazards in their workplace. At a minimum, training materials will include information regarding:

- OSHA Hazard Communication requirements.
- Any operations in the work area where hazardous chemicals are present or are potentially present.
- Location and availability of the written Hazard Communication Program, including the lists of hazardous chemicals and each SDS.
- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area.
- Physical and health hazards of the chemicals in the work area.
- Protection measures such as work practices, emergency procedures, and the appropriate PPE.
- Details of Sundance's Hazard Communication Program, including an explanation of the labeling system and each SDS and how employees can obtain and use the appropriate hazard information.

5.3 REQUIREMENTS FOR EMERGENCY RESPONSE TRAINING

Prior to commencement of the project field activities, Sundance site personnel will review and discuss the posted emergency telephone numbers, the routes to the nearest hospital, identify the persons certified in first aid and CPR, and review emergency procedures and proper use of fire

extinguishers, as well as identify the locations of all site fire extinguishers, the location of first aid kits and bloodborne pathogens kits, and the location of spill kit materials as applicable.

5.4 SAFETY MEETINGS AND TRAINING

5.4.1 Daily Tailgate Safety Meetings

Tailgate Safety Meetings consist of short training sessions in various subjects that give the site worker knowledge and confidence in performing daily duties in a potentially hazardous environment. These meetings are used as an opportunity to address site-specific safety issues, to refresh workers on specific procedures, and to address new hazards and controls as they are identified. The Tailgate Safety Meeting is given prior to the commencement of field work each day, and may consist of topics such as:

- Expected weather conditions.
- Changes to existing procedures or tasks.
- Safety and health considerations for the day's/week's activities.
- General site hazards.
- Environmental conditions encountered.
- New operations or activities.
- Ingress and egress to the work site.
- Exclusion and Support Zones.
- Biological hazards onsite.
- PPE requirements at each site.
- Emergency evacuation procedures.
- Emergency notification and response procedures.
- AHAs for site operations.
- Extreme temperature (heat and cold) precautions.
- Buddy system procedures.
- A review of any safety violations from the previous day.
- Any other significant events involving safety.

Additional briefings will be provided as needed. Sundance will maintain attendance records and meeting notes within the project files.

5.4.2 Daily Debriefing

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

5.4.3 Site-Specific Training and Pre-Entry Briefing

Sundance employees and visitors at the site who may be exposed to safety or health hazards will receive site-specific training before they are permitted to engage in site operations. Sundance will not permit personnel to participate in or supervise site activities until they have been trained to the level required by their specific job function and responsibility. Signatures of those attending and the type of briefing will be entered in the APP acknowledgement form (front page of this APP) or a briefing form before site access is granted. Sundance will use two versions of this training:

- The site worker version will contain full information on site hazards, hazard controls, and emergency procedures.
- The abbreviated version will be used for visitors who are onsite for short times and who will not do hands-on work (observers) and are under safety escort at all times.

5.4.4 Site Worker's Basic Safety Briefing

The PM, SSHO, and/or FTL will conduct a site worker's basic safety briefing at the beginning of the project or whenever new employees arrive at the project site once the job has commenced. The following is a general list of what will be discussed:

- The provisions of this APP.
- Names and titles of key personnel responsible for site safety and health.
- Components of the Site Safety and Health Program.
- General site safety.
- Hazards and symptoms of contaminant exposure (chemical), as applicable.
- Routes of exposure from onsite contaminants (as applicable).
- Physical hazards (fall protection, noise, heat stress, cold stress).
- Biological hazards.
- Location and availability of written Hazard Communication Program.
- Site and activity PPE (including purpose, donning, doffing, and proper use).
- Work practices by which employees can minimize risks for hazards.
- Safe use of engineering controls and equipment.
- Site control measures.
- Personnel decontamination procedures (as applicable).
- Contingency plans (communications, phone numbers, emergency exits, assembly points, etc.).
- Worker Right-to-Know/Hazard Communication.
- Emergency equipment locations and use (fire extinguishers, spill kits, first aid kits, etc.).
- Equipment safety.

Attendance records and meeting notes will be maintained with the project files.

5.4.5 Visitors

Visitors to the site will be escorted and must receive, at a minimum, a briefing of onsite conditions, hazards, and emergency response procedures. Visitors will not be permitted in the restricted work areas while work is being completed unless they have the appropriate level of OSHA training and are medically approved as part of a company-sponsored medical surveillance program. Visitors not complying with the above requirements will not enter the restricted work areas; however, they may observe site conditions from a safe distance in the Support Zone. Visitors will sign a Visitor's Log prior to entering the site.

5.5 TRAINING DOCUMENTATION

Sundance will maintain certificates of completion of offsite training courses and daily safety briefing logs onsite for the duration of the project. Sundance will not permit individuals without proper documentation of required training to work on the project site.

6.0 SAFETY AND HEALTH INSPECTIONS

The purpose of systematically conducting safety and health inspections is to:

- Identify potentially hazardous conditions.
- Provide management with a summary of these conditions.
- Aid management in the establishment of abatement priorities based on potential risk.

Site personnel are expected to inspect their work site or space daily to identify and correct any health and safety deficiencies. The PM, FTL, or SSHO will conduct daily inspections to ensure that site operations and personnel are complying with the APP/SSHP and other regulatory requirements. Sundance will note and correct, as necessary, any operational or environmental deficiencies or issues identified. On a weekly basis, the PM, FTL, or SSHO will conduct an inspection and compliance audit of the work site. This audit will be reported to the SSHO, PM, and/or Program Manager. Attachment 2 of this APP includes the inspection forms necessary for documentation.

6.1 PERIODIC CORPORATE SAFETY AND HEALTH INSPECTIONS

Any Sundance project may be subject to an internal safety inspection to ensure initial and continued compliance of the project with the applicable safety and health regulations. During such inspections, the PM, SSHO, or FTL will escort the auditor, and together these two individuals will comprise a safety inspection team.

6.2 EXTERNAL SAFETY AND HEALTH INSPECTIONS

Sundance does not anticipate, but may consider, the use of outside sources to provide safety inspections as necessary.

7.0 SAFETY AND HEALTH EXPECTATIONS AND COMPLIANCE

Sundance considers the health and safety of its workers to be the highest priority. Personnel are responsible for using safe work practices, for following directives, policies, and procedures, and assisting in maintaining a healthful and safe work environment. Sundance recognizes that open, two-way communication between team members on safety and health issues is essential to an injury-free, productive workplace.

To facilitate a continuous flow of safety and health information between team members, Sundance will accomplish the following:

- Train new team members, during the site-specific training, on the site safety and health policies and procedures including this APP and SSHP (Attachment 1).
- Train new team members on the hazards associated with the job site.
- Conduct daily tailgate safety meetings for team members.
- Distribute safety information.
- Encourage open communications.

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

Sundance has designed this APP to protect safety and health during the course of the project. As part of the job requirements, Sundance employees and subcontractors are required to:

- Read and follow the APP.
- Attend safety training to make them more informed and aware of potential hazards that exist at the site.

7.1 SAFETY PROGRAM NON-COMPLIANCE POLICIES AND PROCEDURES

Sundance management takes employee non-compliance with regards to safety requirements very seriously. Personnel who do not follow procedures are warned and counseled on the proper safety procedures and, if the problem persists, are again counseled with notations made in their permanent records. Continued non-compliance will lead to termination. On Sundance job sites, visitors are briefed about site safety requirements and are provided with the appropriate level of PPE. If visitors refuse to follow these procedures, they will be refused access to the site.

7.2 SUNDANCE'S WRITTEN PROCEDURES FOR HOLDING MANAGERS AND SUPERVISORS ACCOUNTABLE FOR SAFETY

Managers and supervisors are responsible for enforcing safety and health. They are ultimately responsible for protecting the health and welfare of their employees as well as minimizing the potential liability associated with on-the-job or work-related accidents. It is the duty of the PMs and FTLs to motivate employees to adhere to Sundance's safety policy in each work situation.

All PMs and FTLs will have complete understanding of the safe procedure for field activities under their supervision, or when in doubt, will seek assistance prior to initiating a task. If there is any concern an activity cannot be completed safely, it will not be attempted. PMs and FTLs will:

- Explain the safety procedure involved with a task to each employee and check frequently to see that the employee understands and works, as instructed.
- Allocate sufficient time for the training and coaching of all employees to insure that everyone knows the correct procedure for safely accomplishing required tasks.
- Prevent new employees from performing any tasks until required training is completed.
- Correct unsafe conditions that involve site employees or contractors immediately.
- Ensure that the employees are outfitted with and wear PPE as specified by this APP and SSHP.
- Set a good safety example.
- Obtain the cooperation of employees and contractors.
- Provide a safe work environment for employees and contractors.
- Confirm contractor safety performance records have been verified prior to contract award and monitor contractor performance during operations.

8.0 ACCIDENT REPORTING

8.1 EXPOSURE DATA

Sundance tracks and maintains incident records for statistical purposes. Personnel man-hours will be defined as hours worked by all persons assigned to the project, including subcontractor employees under direct supervision of Sundance management staff. If requested, data relating to man-hours worked on the project will be provided to USACE by Sundance.

8.2 ACCIDENT INVESTIGATIONS, REPORTS, AND LOGS

The PM, FTL, and/or SSHO will be responsible for conducting accident investigations. An accident investigation will be conducted for the following:

- Job-related injuries and illnesses.
- Accidents resulting in loss or damage to property above $100.
- Accidents involving vehicles and/or vessels, whether or not they result in damage to property or personnel.
- Accidents in which there may have been no injury or property damage, but which have a high probability of recurring with at least a moderate risk to personnel or property (“Near Miss”).

A systematic approach to accident investigation, identification of causal factors, and implementation of corrective actions is essential to an effective safety and health program and management system.

Accident investigation procedures will include the following:

- Identifying, without placing blame, the basic causal factors that contribute directly or indirectly to accidents.
- Suggesting corrective action alternatives for a given accident.
- Identifying deficiencies in the APP or the SSHP.
- Providing information needed to identify trends and problem areas.
- Satisfying Workers' Compensation and OSHA requirements for recordkeeping and reporting.

If an injury or illness occurs onsite, the PM, FTL, and/or SSHO will be responsible for completing a Sundance Accident Report form immediately. The PM will review the respective form to ensure accuracy and consistency. All accidents/incidents must be investigated by the corporate-assigned individual. The purpose of the investigation is to determine the causal factors that led to the accident/incident and to establish corrective actions to prevent a recurrence.

All accidents will be reported to the USACE CO/COR as soon as possible, and a draft copy of the Accident Report Form will be completed and submitted within 24 hours of the incident. Sundance will investigate the accident and submit findings and corrective actions, as necessary, to the CO/COR within five working days of the accident. Corrective actions will be implemented as quickly as possible.

OSHA recordable injuries and/or illnesses will be entered on the OSHA Form 300 by the SSHO, HSM, or PM. This form will be maintained onsite for the duration of the project and will be forwarded to the Sundance corporate offices for inclusion in reports and required filing.

In the event of accidents that result in a fatality or the hospitalization of three or more employees, Sundance will report the accident to the Department of Labor within eight hours of the incident. In the case of accidents involving subcontractors, each company will be responsible for reporting accidents involving their own employees.

8.3 ACCIDENT RESPONSE

The nearest Sundance workers will immediately assist any person showing signs of medical distress, or anyone involved in an accident, if the accident scene is determined to be safe. Personnel certified in CPR and first aid will provide care as necessary (see Section 8.4, Medical Support). All personnel will follow the established emergency procedures outlined in the SSHP, and will notify the PM, FTL, and SSHO to alert them of a medical emergency situation. The following information will be provided:

- Location of the accident and victim(s) within the work site.
- Nature of the emergency.
- Condition of the victim, including whether the victim is conscious.

- Conditions that resulted in or contributed to the injury, if known.

The appropriate medical response and treatment will be arranged for the victim.

8.4 MEDICAL SUPPORT

A minimum of two onsite personnel will be trained in administering first aid and CPR. The personnel with first aid and CPR training will be identified during a pre-entry briefing held prior to initiating site work, and will be known to all site workers.

Basic supplies for administering first aid will be maintained onsite during activities. These supplies will include:

- First aid kits that conform to Red Cross and 29 CFR 1910.151 requirements and consist of a weatherproof container with individually sealed packages for each type of item.
- Eye wash solution.
- Potable water.
- Antibiotic ointment.

Furthermore, written directions, approximate driving time, and a map to, as well as contact phone numbers for, the nearest medical facility will be maintained onsite. This information will be presented in the SSHP and daily safety briefing.

Details on medical support are provided in Section 13.0 of the SSHP for this project.

8.5 ROUTE TO HOSPITAL AND OCCUPATIONAL CLINIC AND EMERGENCY TELEPHONE NUMBERS

Maps showing the route from the project site to the nearest hospital, along with emergency telephone numbers, are provided in the SSHP in Section 13.3. In addition, contact phone numbers, directions to, and the approximate driving time to the nearest medical facility will be maintained onsite. This information is included in the SSHP and will be discussed during the daily safety meetings.

9.0 PERSONAL PROTECTIVE EQUIPMENT

While the elimination of potential on-the-job hazards through engineering controls must be the goal of any safety and health program, it is neither practical nor feasible to do so in all operations. PPE must, therefore, sometimes be worn to prevent injury and illness of personnel from chemical, physical, and biological hazards. If the equipment is to be effective, i.e., protect the individual from harm, it must be properly selected, fitted, used, and maintained.

Workplace hazard assessments are to be conducted to determine if the use of head, eye, face, hand, foot, or respiratory protection is required. It is anticipated that site personnel will be in Level D or modified Level D PPE.

9.1 PPE SELECTION

If PPE is needed, the selection of the appropriate PPE will be performed by the SSHO, with the advice of HSM. Equipment selected must meet the requirements of 29 CFR 1910, Subpart I. Selection will be based on an evaluation of the:

- Performance characteristics of the PPE relative to the requirements and limitations of the site.
- Task-specific condition and duration.
- Hazards and potential hazards identified at the site.

Selection of the appropriate protective ensemble will conform to the levels of protection as described in the National Institute for Occupational Safety and Health (NIOSH)/OSHA/U.S. Coast Guard/U.S. Environmental Protection Agency Occupational Safety and Health Guidance Manual Hazardous Waste Site Activities, October 1985, NIOSH Pub. 85-115. However, the ensemble must be tailored to the specific work conditions in order to provide the appropriate level of protection. Required PPE is site-specific and is described in the SSHP.

The type of equipment and level of protection must be reevaluated periodically by the SSHO in light of any new information about the site. The PPE will be upgraded or downgraded accordingly.

9.2 PPE USE

PPE must be used properly or it will not provide the protection for which it was intended. Use limitations include:

- ***Material***—PPE material must be selected based upon expected site contaminants. Infiltration/degradation rates of PPE material vary depending upon type and duration of chemical exposure.
- ***Size***—PPE must be sized appropriately for the personnel wearing the PPE. Tight PPE will experience faster permeation and degradation rates. PPE that is too loose may present trip or snag hazards.
- ***Work Duration***—May affect material permeability, air supply (for jobs requiring supplied air).
- ***Facial Hair***—Not permitted between the face and the sealing surface of the respirator.
- ***Eyeglasses***—Those with earpiece bars must not be worn with full-face piece respirators. A spectacle kit must be installed in the face piece of workers requiring glasses.

Proper fitting of PPE is essential if it is to provide adequate protection.

9.2.1 Donning and Doffing Procedures

A donning and doffing procedure should be established and practiced periodically. In general, the donning procedure will include:

- Inspecting the PPE.
- Adjusting specific equipment to fit user, e.g., hard hat.
- Stepping into protective coveralls (if required).
- Putting on boots and taping leg to boot top (if required).
- Donning respirator and performing positive/negative fit test (if required).
- Putting on gloves and taping to sleeve (if required).
- Putting on hard hat, if required.
- Raising hood over the head and adjust.
- Having an assistant check all closures.

Doffing procedures must be established to prevent contaminants from the work area from being transferred to the wearer's body. Direct contact with the outside surfaces of the PPE should be avoided.

9.2.2 Inspection and In-Use Monitoring

Inspection of PPE (if needed) will be performed prior to use. During equipment use, employees must be alert to conditions which may indicate that the effectiveness of the PPE has been diminished, including:

- Degradation of the PPE.
- Perception of odors.
- Skin irritation.
- Unusual residues on PPE.
- Discomfort.
- Resistance to breathing.
- Fatigue due to respirator use.
- Interference with vision or communication.
- Restriction of movement.
- Personal responses such as rapid pulse, nausea, dizziness, headaches, and chest pain.
- Heat stress.

9.3 MAINTENANCE AND STORAGE

Since most PPE is disposable, maintenance of PPE is primarily limited to respirators. However, the need for respiratory protection is not anticipated for completion of this project. If PPE

requiring respiratory protection become necessary, the SSHP will address requirements for a respiratory protection program.

Non-disposable PPE, including but not limited to hard hats, safety glasses, and safety boots, will be inspected prior to use to ensure the PPE is in working order. Hard hats will be stored away from direct sunlight to reduce photo-degradation of the hard hat material. Glasses will be stored in such a manner as to reduce scratching.

9.4 DECONTAMINATION

Decontamination procedures will be determined based on the anticipated contaminants for a given project. Wash tubs containing a detergent-water solution or another appropriate decontaminant solution and soft bristle brush will normally be used to decontaminate reusable personal protective clothing and boots.

10.0 PLANS (PROGRAMS, PROCEDURES) REQUIRED BY EM 385-1-1

10.1 LAYOUT PLANS

Laydown areas are not required for this project, so layout plans are not applicable.

10.2 EMERGENCY RESPONSE PLAN

Prior to work startup, all Sundance personnel, including subcontractors, will be familiar with this Emergency Response Plan. The PM, FTL, or SSHO will make this plan available for review and copies will be maintained at the project site and made accessible to all project personnel.

Sundance personnel will become familiar with the routes to the closest Level I Trauma Center (**University of New Mexico Hospital**, in Albuquerque, NM), and nearest medical care facilities, **Rehoboth McKinley Christian Hospital** (hospital for severe or life threatening conditions) and **Rehoboth McKinley Christian Health Care Services** (non-life threatening). Section 13.0 of the SSHP contains the complete Emergency Response Plan for this project.

If necessary, onsite emergencies will ultimately be handled by onsite emergency support personnel such as the local fire department, ambulance squad, or local police/security, depending upon the nature of the emergency. Initial response and first aid treatment, however, will be available through trained onsite personnel.

10.2.1 Procedures and Tests

Emergency procedures and tests are addressed in Section 13.0 of the SSHP.

10.2.2 Spill Plans

A spill plan is not applicable to this project.

10.2.3 Firefighting Plan

Fire prevention is discussed in Section 13.5 of the SSHP.

10.2.4 Posting of Emergency Telephone Numbers

The emergency contact list is provided in Section 13.3 of the SSHP.

10.2.5 Man Overboard/Abandon Ship

A Man Overboard/Abandon Ship plan is not required for this project.

10.3 HAZARD COMMUNICATION PROGRAM

The purpose of this Hazard Communication Program is to ensure that important information regarding hazardous chemicals used, handled, or stored during the conduct of business is transmitted to employees and other affected persons as appropriate.

It is each individual's "Right-to-Know" the chemical identities and chemical hazards with which they are working. When employees have information about the chemicals being used, they can take steps to reduce exposures, substitute less hazardous materials, and establish proper work practices. Access to chemical hazard information as outlined in this program is fundamental to protecting the safety, health, and welfare of our employees and other affected persons.

A hazardous chemical, as defined by OSHA, means any chemical that is either a physical hazard or health hazard and includes hazardous chemicals generated during work operations (e.g., welding fumes). Chemical hazard information will be made available to employees and other affected persons, as appropriate, through the implementation of this comprehensive program which includes container labeling and other forms of warning, the collection and compilation of SDSs, and training. A summary of the hazard communication program, as it pertains to this project, is presented below.

10.3.1 Chemicals Included in the Hazard Communication Program

This program applies to hazardous chemicals that are known to be present in the workplace and used or stored in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

It is the responsibility of the SSHO to ensure that chemical materials meet the provisions of this Hazard Communication Program. If there are any questions regarding the applicability of these program requirements to a particular material or situation, the HSM will be consulted.

10.3.2 Chemicals and Materials Exempt from the Hazard Communication Program

The following materials are exempt from requirements of the program:

- Hazardous waste as defined by the RCRA when subject to regulations issued under the U.S. Environmental Protection Agency.
- Hazardous substances as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) when subject to regulations issued under CERCLA by U.S. Environmental Protection Agency.
- Tobacco or tobacco products.

- Wood or wood products which are not processed; wood treated with a hazardous chemical, and wood which may be sawed or cut, generating dust.
- Articles which are a manufactured item other than a fluid or particle; which are formed to a specific shape or design during manufacture; which have end use functions dependent in whole or in part upon its shape or design during end use; and which, under normal conditions or use, do not release more than minute or trace amounts of a hazardous chemical and do not pose a physical hazard or health risk to employees.
- Any drug when it is in solid, final form for direct administration such as over-the-counter drugs and first aid supplies.
- Cosmetics.
- Any consumer product or hazardous substance where it can be demonstrated that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended.
- Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard.
- Ionizing and non-ionizing radiation.
- Biological hazards.

10.3.3 Lists of Hazardous Chemicals

OSHA requires that lists of hazardous chemicals known to be present be compiled for the workplace as a whole or for individual work areas. The HSM or designated alternate will conduct an inventory as needed, but no less than annually, in order to develop and maintain an accurate list of all covered hazardous chemicals. As per this requirement, a summary of the hazardous chemicals planned to be present in the work area is provided below. The SDSs for hazardous chemicals anticipated to be onsite during project activities are included in the SSHP under Appendix A.

10.3.4 Labels and Other Forms of Warning

It is expected that some chemicals may be used during field activities. Site personnel will rely upon the original product labels to the extent practical. When labels must be applied to a temporary container, they will be printed in English and contain the following information:

- Identity of the hazardous chemical(s).
- Appropriate hazard warnings, i.e., any words, pictures, symbols, or combination thereof, which provide employees with specific information regarding the physical or health hazard(s) including primary target organ effect(s).
- Name of the chemical manufacturer, importer, or other responsible party, if appropriate.

Labels and other forms of warning will be legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift.

If existing labels already contain the required information, new labels are not required.

10.3.5 Alternatives to Labeling, Tagging, or Marking Requirements

Alternatives to the above-referenced labeling, tagging, or marking requirements are described below:

- Signs, placards, process sheets, batch tickets, operating procedures, or other such written materials may be used in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the marking information required above. The written materials will be readily accessible to employees in their work area throughout each work shift.
- Portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer, are not required to be labeled.

10.3.6 Shipping Hazardous Chemicals

OSHA requires that chemical manufacturers, importers, and distributors ensure that each container of hazardous chemicals leaving their workplace is labeled, tagged, or marked with specific information, including:

- Identity of the hazardous chemical(s) (i.e., chemical name or common name as listed on the SDS).
- Appropriate hazard warnings (i.e., any words, pictures, symbols, or combination thereof which provide employees with specific information regarding the specific physical or health hazard(s), including primary target organ effect[s]).
- Name and address of the chemical manufacturer, importer, or other responsible party, if appropriate.

In addition to the above, the SSHO or the PM will ensure that containers of hazardous chemicals being shipped are marked in a manner which does not conflict with the requirements of the U.S. Department of Transportation.

For the shipment of environmental samples (e.g., soil, groundwater, air, soil vapor, etc.), labeling and SDS requirements outlined herein are not required under this Hazard Communication Program. Personnel should follow proper packaging and shipping requirements as established by the U.S. Department of Transportation and/or International Air Transport Association/ International Civil Aviation Organization.

If the hazardous chemical being shipped is regulated by OSHA in a substance-specific health standard, the HSM will ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

10.3.7 Safety Data Sheets

Chemical manufacturers and importers are required to obtain or develop an SDS for each hazardous chemical they produce or import.

The PM and/or SSHO will maintain a copy of the SDS for each hazardous chemical brought onsite, and will ensure that they are readily accessible during each work shift to employees when they are in their work area(s). SDSs for chemicals expected to be used to complete the project are included in Appendix A of the SSHP.

During the conduct of site-specific field operations, the list of hazardous chemicals and the SDS must be readily available onsite. Their location will be accessible and made known by the SSHO to all affected persons on a per-project basis.

10.3.8 Employee Information and Training

Training and education are ongoing essential parts of this Hazard Communication Program. It is important that employees not only have access to the technical information regarding the chemical hazards in their workplace but they must understand what it says. Training, information, and education are intended to give employees the skills they need to do their jobs in a way that protects their safety, health, and welfare. Training requirements are described in Section 5.0 of this APP.

10.4 RESPIRATORY PROTECTION PLAN

Respiratory protection is not anticipated for this project based on the Project Work Statement (PWS). A respiratory protection plan is therefore not required for this project. However, should respiratory protection becomes necessary; a respiratory protection program will be presented as part of the SSHP.

10.5 HEALTH HAZARD CONTROL PROGRAM

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. AHAs will be used for these evaluations. The analyses will identify all substances, agents, and environments that present a potential hazard and will recommend hazard control measures. The required AHAs will be completed in the field before beginning each work activity. Engineering and administrative controls will be used, when possible, to control hazards; in cases where engineering or administrative controls are not feasible, PPE will be used.

10.6 LEAD ABATEMENT PLAN

A lead abatement plan is not required based on the PWS.

10.7 ASBESTOS ABATEMENT PLAN

An asbestos abatement plan is not required based on the PWS.

10.8 ABRASIVE BLASTING PLAN

An abrasive blasting plan is not required based on the PWS.

10.9 CONFINED SPACE PLAN

A confined space program is not required based on the PWS.

10.10 HAZARDOUS ENERGY CONTROL PLAN

A lockout/tagout site-specific plan is not required for this project.

10.11 CRITICAL LIFT PROCEDURES

Critical lifting is not required for the completion of this project.

10.12 CONTINGENCY PLAN FOR SEVERE WEATHER

Procedures for dealing with severe weather are described in Section 2.4.8 of the SSHP (Attachment 1).

10.13 ACCESS AND HAUL ROAD PLAN

An access and haul road plan is not required for this project.

10.14 DEMOLITION PLAN

A demolition plan is not required based on the PWS.

10.15 EMERGENCY RESCUE PLAN (TUNNELING)

The need for tunneling is not anticipated based on the PWS.

10.16 UNDERGROUND CONSTRUCTION FIRE PREVENTION AND PROTECTION PLAN

An underground construction fire prevention and protection plan is not required based on the PWS.

10.17 COMPRESSED AIR PLAN

A compressed air plan is not required based on the PWS.

10.18 FORMWORK AND SHORING ERECTION AND REMOVAL PLANS

Formwork and shoring erection and removal plans are not required for this project.

10.19 PRECAST CONCRETE PLAN

A precast concrete plan is not required based on the PWS.

10.20 JACKING PLAN (LIFT) SLAB PLAN

A jacking plan (lift) slab plan is not required for this project based on the PWS.

10.21 SITE SAFETY AND HEALTH PLAN

An SSHP has been developed to describe the specific safety and health procedures to be followed when working on the project work site. The SSHP has been added as an attachment to this APP (Attachment 1).

10.22 BLASTING SAFETY PLAN

A blasting plan is not required for this project.

10.23 PLAN FOR PREVENTION OF ALCOHOL AND DRUG ABUSE

A Corporate Program for prevention of alcohol and drug abuse will be provided upon request.

10.24 DIVING PLAN

A diving plan is not required based on the PWS.

10.25 STEEL ERECTION PLAN

Steel superstructures will not be required based on the PWS.

10.26 NIGHT OPERATIONS LIGHTING PLAN

Work is not expected to be completed at night. Therefore, a lighting plan is not required for the completion of this project.

10.27 SITE SANITATION PLAN

During project operations, personnel will utilize existing or nearby sanitation services or a portable bathroom will be mobilized to the site.

10.28 FIRE PREVENTION PLAN

These procedures establish the basic requirements for fire prevention and protection equipment, and provides for the development of an emergency action plan. Fire prevention is discussed under Section 13.5 of the SSHP.

11.0 CONTRACTOR INFORMATION

Sundance is the prime contractor on this project; this APP and attached SSHP are based on Sundance procedures. Sundance will provide personnel with the necessary training and experience to safely execute this project. Sundance employees will be competent in the respective areas of site work for which they will be involved.

Subcontractors will be required to comply with site requirements and will attend the initial mobilization training, which will describe the work to be performed and the safety and health requirements regarding that work. They will also be required to attend the daily tailgate safety briefings, which will go over the operations expected to take place that day. Subcontractors will also attend any special safety meetings that are taking place for the duration of their operations on the site. They will be required to abide by the safety and health requirements of this APP and the attached SSHP for all work performed on the project site.

12.0 REFERENCES

U.S. Army Corps of Engineers (USACE), 2014. *Safety and Health Requirements Manual* (EM-385-1-1).

Code of Federal Regulations (CFR). 29 CFR 1904 Recording and Reporting Occupational Injuries and Illnesses;

------ 29 CFR 1904 Recording and Reporting Occupational Injuries and Illnesses.

------ 29 CFR 1910 Occupational Safety and Health Standards for General Industry.

------ 29 CFR 1926 OSHA Construction Standards.

ATTACHMENT 1:
SITE SAFETY AND HEALTH PLAN

SITE SAFETY AND HEALTH PLAN

FOR

Parcel 3 Groundwater RCRA Facility Investigation
Fort Wingate Depot Activity
McKinley County, New Mexico

Contract Number W912PP-15-C-0014

Prepared For:
United States Army Corps of Engineers
Albuquerque District
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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
AHA	Activity Hazard Analysis
AOC	Area of Concern
APP	Accident Prevention Plan
BEC	BRAC Environmental Coordinator
BRAC	Base Realignment and Closure
CAMU	Corrective Actions Management Unit
CDC	Centers for Disease Control and Prevention
CFR	Code of Federal Regulations
COI	Contaminant of Interest
COR	Contracting Officer's Representative
CPR	cardiopulmonary resuscitation
EM	Engineer Manual
EZ	Exclusion Zone
FTL	Field Team Leader
FWDA	Fort Wingate Depot Activity
HazCom	Hazard Communication
HAZWOPER	Hazardous Waste Operations and Emergency Response
H&S	Health and Safety
HSM	Health and Safety Manager
HTRW	Hazardous, Toxic and Radioactive Waste
IDW	Investigation-Derived Waste
MEC	munitions and explosives of concern
mph	miles per hour
MPPEH	material potentially presenting an explosive hazard
MSP	Medical Surveillance Program
NMED	New Mexico Environment Department
OB/OD	Open Burning/Open Detonation
OESS	Ordnance Explosives Safety Specialist
OSHA	Occupational Safety and Health Administration

PM	Project Manager
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RMSF	Rocky Mountain Spotted Fever
SDS	Safety Data Sheet
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SWMU	Solid Waste Management Unit
SZ	Support Zone
Sundance	Sundance Consulting, Inc.
SVOC	semi-volatile organic compound
TNT	trinitrotoluene
U.S.	United States
USACE	United States Army Corps of Engineers
UXO	Unexploded Ordnance
VOC	volatile organic compound

1.0 INTRODUCTION

This Site Safety and Health Plan (SSHP) has been prepared for the Parcel 3 Groundwater Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) project at Fort Wingate Depot Activity (FWDA), in accordance with the Installation's RCRA Permit Number NM 6213820974, Sections V and VIII.B.

Sundance Consulting, Inc. (Sundance) will perform the Parcel 3 groundwater RFI activities for United States Army Corps of Engineers (USACE), Contract Number W912PP-15-C-0014. This SSHP describes the Health and Safety (H&S) guidelines developed to protect onsite personnel, visitors, and the public from hazards encountered during field activities. The procedures and guidelines contained herein were based upon the best information available during preparation of the SSHP. Specific requirements may be revised if new information is received or conditions change. This SSHP has been prepared in accordance with the following:

- Engineer Manual (EM) 385-1-1, Safety and Health Requirements Manual (USACE, 2014).
- Engineer Regulation 385-1-92, Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) (USACE, 2003).
- New Mexico Environment Department (NMED), RCRA Permit Number NM6213820974, Sections V and VIII.B. (NMED 2005, revised 2014).

1.1 BACKGROUND

Originally founded in 1860 as a cavalry post, the United States (U.S.) Army established Fort Wingate as a munitions storage depot in 1918. The FWDA installation has had a number of missions since then, including ordnance storage, testing, and demilitarization, as well as missile defense testing. Since 1975, the installation has been under the administrative command of Tooele Army Depot, located near Salt Lake City, Utah.

At the present, approximately half of the FWDA is leased to the Missile Defense Agency and is used for operations related to missile testing. The remaining FWDA operations are focused on assessment and remediation of contamination resulting from past military activities. Efforts to remediate affected areas have concentrated on the removal of exploded and unexploded ordnance, in addition to characterizing soil across the installation and conducting semi-annual groundwater monitoring. The installation can be divided into several areas, based upon location and historical land use. These major land-use areas include the following:

- The Administration Area—Located in the northern portion of the installation and encompasses approximately 800 acres; consists of former office facilities, housing, equipment maintenance facilities, warehouse buildings, and utility support facilities.
- The Workshop Area—Located south of the Administration Area and encompasses approximately 700 acres; consists of an industrial area containing former ammunition maintenance and renovation facilities, the former trinitrotoluene (TNT) washout facility, and the TNT Leaching Beds Area.
- The Magazine (Igloo) Area—Located in the central portion of the installation and covers approximately 7,400 acres; consists of areas that encompass 10 Igloo Blocks

(A through H, J, and K) that contain 732 earth-covered igloos and 241 earthen revetments previously used for munitions storage.

- Protection and Buffer Areas—Located adjacent to the eastern, northern, and western boundaries of the installation and encompasses approximately 4,050 acres; consists of buffer zones surrounding the former magazine and demolition areas.

At present, FWDA has been undergoing final environmental restoration prior to property transfer/reuse. As part of the planned property transfer to the Department of Interior, the installation has been divided into reuse parcels with each site being addressed on a parcel-by parcel basis.

1.2 SUNDANCE SAFETY POLICY

Sundance believes in promoting a strong safety culture by providing each associate with the training, support, and resources needed to perform their job safely. Sundance believes that nothing is more important than the safety and well-being of their associates in the work place. We strive to limit the risk of exposure to our associates in the work place, and each associate is empowered to stop work if they feel their safety or the safety of fellow associates is compromised. Sundance associates are encouraged to speak up without fear of reprisal and understand they are a key component to safe execution on the job. The complete Sundance Statement of Safety and Health Policy is provided in the Accident Prevention Plan (APP).

1.3 SITE LOCATION AND DESCRIPTION

The FWDA currently occupies approximately 24 square miles (15,277 acres) of land in western New Mexico in McKinley County (Figure 1-1: Site Location Map). The FWDA is located approximately seven miles east of Gallup and about 130 miles west of Albuquerque. The main entrance to the FWDA is on U.S. Highway 66, west from Exit 33 off Interstate 40. The Facility is surrounded by federally-owned and administered lands, including national forest lands, Zuni tribal lands, and Navajo tribal lands. North and west of the Facility are Navajo trust and Native American allotted lands. To the east are lands that are administered by the Bureau of Indian Affairs, and to the south and southeast is the undeveloped Cibola National Forest.

Parcel 3 is located in the southern portion of FWDA and consists of the following areas:

- Solid Waste Management Unit (SWMU) 15 – Old Demolition Area
- SWMU 33 – Waste Pile KP1
- SWMU 74 – Area 16 or Site 16 (proposed burning ground)
- Area of Concern (AOC) 89
- AOC 90
- AOC 91
- AOC 92
- Open Burning/Open Detonation (OB/OD) Unit – inactive OB/OD unit includes the Burning Ground Area, twelve Current Detonation Craters, and ten Current Residue Piles

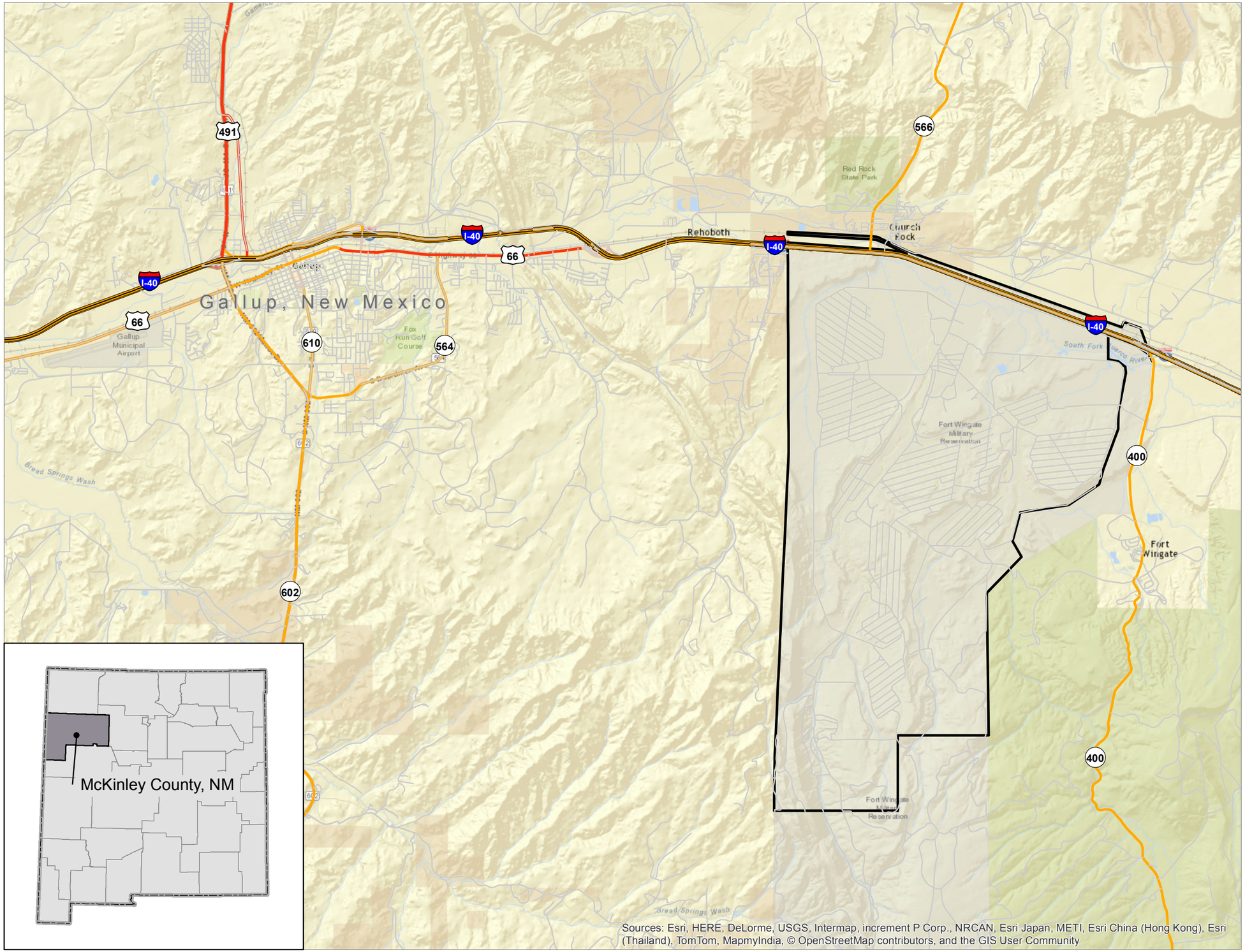
- Corrective Actions Management Unit (CAMU) – active OB/OD treatment unit

1.4 PROJECT SCOPE

The purpose of this project is to assess groundwater quality in the OB/OD area SWMUs, AOCs, and the CAMU at the installation, implementation of the field investigation to achieve this objective, and preparation of an RFI report.

Field activities covered by this SSHP include the following:

- Munitions and Explosives of Concern (MEC) avoidance
- Drilling temporary and permanent wells
- Sampling groundwater
- Sampling subsurface soil
- Managing investigation-derived waste (IDW)



Legend

- FWDA Site Boundary
- Interstate
- US Highway
- State Highway
- County, Arterial Road

Notes

FWDA = Fort Wingate Depot Activity
US = United States
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation

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Sundance Consulting Inc.

Figure 1-1

SITE LOCATION MAP

FORT WINGATE DEPOT ACTIVITY
MCKINLEY COUNTY, NEW MEXICO

Author: Document Path: C:\Users\bdavis\Documents\ArcGIS\FortWingate\August2015Work\SiteLoc.mxd Document Name: SiteLoc

2.0 HAZARD ANALYSIS

To ensure the safety and health of site personnel and the public, and to comply with the hazard assessment requirements of the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Personal Protective Equipment (PPE) standard (29 Code of Federal Regulations [CFR] 1910.132[d]) and USACE EM 385-1-1, Sundance will perform an Activity Hazard Analysis (AHA) for each site task before beginning work. The tasks listed below have a potential for exposure to site hazards that will require the use of engineering controls, administrative controls, or PPE to minimize or reduce worker exposure. Field tasks associated with the groundwater RFI activities will consist of the following:

Task 1: Mobilization and demobilization, including vehicle operation

Task 2: MEC avoidance using a magnetometer

Task 3: Drilling

Task 4: Groundwater sampling

Task 5: Subsurface soil sampling

Task 5: Disposal of IDW

For each task listed, site personnel will utilize the procedures and don the PPE described in the APP and this SSHP to control or eliminate hazards. All personnel and site visitors will be familiar with site hazards and will strictly adhere to the appropriate safety procedures and AHAs prescribed in this SSHP and the project APP. Each AHA will identify potential safety, health, chemical, biological, physical, and environmental hazards associated with specific tasks, and provide for the protection of personnel, the community, and the environment. Because of the complexity and constant change of project conditions, sites must continually be inspected to identify new hazards. In the event of changes to the scope of work or site conditions, Sundance will develop additional AHAs for new tasks and add as necessary.

Site personnel must understand that the evaluation of site characteristics and hazards is an ongoing process that will continue throughout the duration of the project and in which site personnel play a major role. Site personnel will be vigilant in recognizing workplace hazards and bringing them to the attention of the Site Safety and Health Officer (SSHO), and/or the Project Manager (PM). If changes occur in the level or types of hazards present for a currently evaluated task, the PM will inform the SSHO of the change. If needed, Sundance will complete a new AHA to outline the hazards, control methods, and PPE for the task. Responsible Sundance personnel will review and approve any additions to the approved SSHP and submit to the USACE Contracting Officer's Representative (COR) for final approval. Once approved, Sundance will add the changes to the SSHP.

2.1 ORDNANCE AND EXPLOSIVES HAZARDS

MEC investigation and removal actions have been performed in selected locations within the FWDA. The potential for encountering MEC items in the OB/OD area is high. The following sections will address the safety and health procedures that will be used for reducing the hazards associated with MEC during activities under the RFI and this SSHP.

2.1.1 Munitions and Explosives of Concern

MEC is defined as ammunition, ammunition components, chemical or biological warfare material, or explosives that have been abandoned, expelled from demolition pits or burning pads, lost, discarded, buried, or fired. Unexploded ordnance (UXO)-qualified technicians are trained in the identification, handling, defusing, and classification of UXO items including MEC and material potentially presenting an explosive hazard (MPPEH).

UXO is defined as military munitions that have been primed, fused, armed, or otherwise prepared for action and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to the operations, installations, personnel, or material, and remain unexploded either by malfunction, design, or any other cause. UXO, if disturbed, (touched, picked up, played with, kicked, thrown, etc.) may explode without warning, making it potentially hazardous.

For the purpose of this SSHP, Sundance will consider MPPEH and MEC items as UXO and treat as such. The OB/OD area has a high potential for encountering MEC which are readily apparent on the ground surface in many places.

2.1.2 General MEC Work Procedures

When areas with a high potential for encountering MEC need to be entered, personnel must first get authorization from the SSHO, PM, and the onsite Ordnance Explosives Safety Specialist (OESS). Upon receiving authorization, the procedures and practices listed below will be strictly enforced.

- UXO-qualified technicians are to be onsite at all times during field activities within areas potentially containing MEC.
- UXO-qualified technicians will identify MEC.
- Only the minimum number of personnel required to perform a given activity within the areas potentially containing MEC will be involved in the operation.
- Sundance field personnel are not permitted to move and/or handle MEC at any time.
- Non-UXO-qualified personnel will receive site-specific MEC recognition training prior to entering and performing work in these areas.
- Personnel who are working in areas potentially containing MEC items will not wear inner or outer garments having static electricity-generating characteristics while in these areas.
- Only UXO-qualified personnel will be involved in the investigation, identification, and marking of known or potential MEC items.
- No smoking, or possession or use of open flame or spark producing sources will be allowed in the Exclusion Zone (EZ). Unless the task performed requires the use of open flame or a spark-producing source, then the SSHO or team leader may approve possession or use only in designated areas.
- Personnel will not attempt to extinguish burning explosives or any fire that might involve explosive materials.

- Personnel will stay on roads and paths designated by UXO-qualified staff.

2.2 CHEMICAL HAZARDS

Hazardous substances are those materials that can threaten human health and/or environmental well-being if the substance has been improperly disposed of or uncontrollably released into the environment. Occupational exposure would be a result of personnel encountering the release of hazardous constituents capable of causing harm to site personnel during site operations. Exposure to contaminants with a potential for causing an occupational exposure situation may be possible during performance of groundwater RFI activities. Detected concentrations of contaminants of interest (COIs) in groundwater exceed groundwater cleanup levels in some locations within FWDA. These COIs may include: explosives, metals, nitrate, nitrite, volatile organic compounds (VOCs), and perchlorate. In addition, semi-volatile organic compounds (SVOCs), pesticides, and herbicides have also been detected in soil and groundwater in some locations within FWDA.

2.2.1 Onsite Chemical Hazards

Potential for limited exposure may occur during tasks that require the handling of potentially-contaminated groundwater. Potential chemicals of concern historically used at FWDA and historically detected during previous investigations include: explosives, metals, nitrate, nitrite, perchlorate, VOCs, SVOCs, diesel range organics, and gasoline range organics. These chemicals may present both acute and long-term exposure hazards, although the potential for exposure during tasks as currently planned is low.

Potential for exposure may also occur during tasks that require the use of products that contain hazardous constituents. The products that may be used and contain hazardous constituents include: gasoline and two stroke engine oil/gasoline mixtures, calibration acids/bases/fluids, acids used for water sample preservatives, battery acids related to power supplies, and decontamination detergents. Personnel exposures will be controlled and minimized through limits on the quantities of these products used at any one time and ensuring the products are only used under well-ventilated conditions.

The procedures and PPE outlined in this SSHP will be used, as necessary, to further reduce or eliminate the potential for personnel exposure to these hazardous constituents. If site activities are modified, or evidence of environmental contamination is found, the potential for chemical exposure will be re-evaluated. Information on the hazardous constituents that may present potential exposure hazards is presented in Table 2-1.

Safety Data Sheets (SDSs) for hazardous materials have been included in Appendix A and will be available at the project site.

2.3 RADIOLOGICAL HAZARDS

Radiological hazards are not anticipated within the project area.

2.4 PHYSICAL HAZARDS

Based on the nature of the planned site operations, the potential and risk for exposure to physical hazards is high for this project. Physical hazards that may be encountered during site operations are addressed in the following sections.

Training on the contents of this portion of the SSHP will be provided during safety tailgate meetings prior to the beginning of each day's work. Topics to be discussed will include proper procedures and first aid treatment for heat and cold-related illnesses, proper clothing, eating and drinking habits during field activities, and the recognition of signs and symptoms of both heat and cold stress. Safe hot and cold weather work practices will also be discussed.

2.4.1 Thermal Stress

Due to the varied climate changes at the site project, thermal stress may pose a major health and safety concern. Other adverse weather conditions (such as wind and blowing dust, rain, and snow) can cause workers to be distracted, irritable, and error-prone. Heat stress injuries are commonly exhibited through one or more of the following symptoms: heat rash, heat cramps, heat exhaustion, and heat stroke. Cold stress injuries are commonly exhibited through symptoms of either hypothermia and/or frostbite.

Table 2-1: Occupational Exposure and Toxicological Properties for Contaminants with Occupational Health Concerns

Contaminant	OSHA PEL	NIOSH REL	ACGIH TLV	OSHA ACGIH STEL	NIOSH IDLH	Exposure Route	Symptoms	Target Organs
Gasoline	ND	ND	ND	ND	ND	INH, ABS, ING, CON	Irritation eyes, skin, mucous membrane; dermatitis; headache, lassitude (weakness, exhaustion), blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis (aspiration liquid); possible liver, kidney damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, central nervous system, liver, kidneys
Fuel Oil #1	ND	100 mg/m3 TWA	ND	ND	100 ppm	INH, ING, CON	Irritation eyes, skin, nose, throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system
Toluene	200 ppm TWA, 300 ppm Ceiling, 500 ppm 10 minute maximum peak	100 ppm (375 mg/m3) TWA	50 ppm (188 mg/m3) TWA [skin]	150 ppm (560 mg/m3) STEL	500 ppm	INH, ABS, ING, CON	Irritation eyes, nose; lassitude (weakness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys
Benzene	TWA 1 ppm	TWA 0.1 ppm, STEL 1 ppm	10 ppm (32 mg/m3) TWA	5 ppm	500 ppm	INH, ABS, ING, CON	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]	Eyes, skin, respiratory system, blood, central nervous system, bone marrow
Cadmium	0.005 mg/m3 TWA	ND	0.01 mg/m3 (total dust) TWA, 0.002 mg/m3 (respirable dust) TWA	ND	9 mg/m3	INH, ING	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain, headache, chills, muscle aches, nausea, vomiting, diarrhea, anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia, [potential occupational carcinogen]	Respiratory system, kidneys, prostate, blood
Chromium	1 mg/m3 TWA	0.5 mg/m3 TWA	0.5 mg/m3 TWA	ND	250 mg/m3	INH, ING, CON	Irritation of the eyes, skin, lung fibrosis (histologic)	Eyes, skin, respiratory system
Trinitrotoluene (TNT)	1.5 mg/m3 TWA	0.5 mg/m3 TWA	0.01 mg/m3 (total dust) TWA, 0.002 mg/m3 (respirable dust) TWA	ND	500 mg/m3	INH, ABS, ING, CON	Irritation skin, mucous membrane, liver damage, jaundice, cyanosis, sneezing, cough, sore throat, peripheral neuropathy, muscle pain, kidney damage, cataract, sensitization dermatitis, leukocyclosis (increased blood leukocytes), anemia, cardiac irregularity	Eyes, skin, respiratory system, blood, liver, cardiovascular system, central nervous system, kidneys
Perchlorate (ammonium)	ND	ND	ND	ND	ND	INH, ING	Irritation eyes, skin, ingestion – burning sensation, nausea, vomiting, diarrhea	Respiratory system, thyroid

ABS = Absorption
ACGH = American Conference of Governmental Industrial Hygienists
CON = Contact
IDLH = Immediately Dangerous to Life and Health
ING = Ingestion
INH = Inhalation
mg/m3 – milligram per cubic meter or air
ND – no data
NIOSH – National Institute for Occupational Safety and Health
ppm – parts per million

2.4.1.1 Heat Stress

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Extremely hot weather can cause physical discomfort, loss of efficiency, or personal injury. Because heat stress is probably one of the most common illnesses at a site, regular preventive measures are vital. Individuals vary in their susceptibility to heat stress.

Personnel (including subcontractor employees) potentially exposed to heat stress conditions will be made aware of the sources of heat stress, how the body handles heat, heat-related illnesses, preventive/corrective measures, and first aid procedures.

Signs and Symptoms of Heat Stress

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur ranging from mild to fatal. Heat-related problems include the following:

- Heat Rash—Caused by continuous exposure to heat and humidity and aggravated by chafing clothes. Heat rash decreases the body's ability to tolerate heat as well as being a nuisance.
- Heat Cramps—Caused by profuse perspiration with inadequate electrolytic fluid replacement. Heat cramps cause painful muscle spasms and pain in the extremities and abdomen.
- Heat Exhaustion—Caused by increased stress on various organs to meet increased demand to cool the body. Heat exhaustion causes willow breathing; pale, cool, moist skin; profuse sweating; and dizziness. Heat exhaustion can be alleviated by promptly moving the affected individual to a cool place to lie down and by providing cool fluids to drink.
- Heat Stroke—Most severe form of heat stress. Heat stroke symptoms include hot, dry skin; no perspiration; nausea; dizziness; confusion; strong, rapid pulse; and coma. The body must be cooled immediately to prevent severe injury or death.

Heat Stress Prevention

One or more of the following practices will help reduce the probability of succumbing to heat stress:

- Acclimate workers to heat conditions when field operations are conducted during hot weather.
- Provide plenty of liquids to replace the body fluids lost by perspiration. Fluid intake must be forced because, under conditions of heat stress, the normal thirst mechanism is not adequate to bring about a voluntary replacement of lost fluids.
- If possible, install mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- If possible, conduct field operations in the early morning.
- Train personnel to recognize the signs and symptoms of heat stress and its treatment.
- Rotate personnel to various job duties, if possible.

- Provide shade or shelter to relieve personnel of exposure to the sun during rest periods.

Individuals succumbing to the symptoms of heat-stress will notify the SSHO immediately. At the onset of heat stress, the aforementioned prevention practices no longer apply. Activities will be halted, and treatment will be initiated. Early detection and treatment of heat stress will prevent further serious illness or injury and lost work time. Proper and effective heat stress treatment can prevent the onset of more serious heat stroke or exhaustion conditions. Individuals that have succumbed to any heat-related illness become more sensitive and predisposed to additional heat stress situations.

Heat Stress Monitoring

Operations that involve worker exposure to high air temperatures, radiant heat sources, high humidity, and direct contact with hot objects or strenuous activities have a high potential for heat stress. With the use of PPE, the potential for inducing heat stress is exacerbated further. Depending on the planned work activities and the protective clothing anticipated, the heat stress potential must be considered at ambient temperatures at or above 70 degrees Fahrenheit (°F).

Individual Monitoring

Every worker who works in extraordinary conditions that increase the risk of heat stress should be personally monitored. Personal monitoring can be performed by checking the heart rate, recovery heart rate, oral temperature, or extent of body water loss.

To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period. The recovery heart rate can be checked by comparing the pulse rate taken at 30 seconds with the pulse rate taken at 2.5 minutes after the rest break starts.

Oral temperature can be checked with a clinical thermometer after work but before the employee drinks water. If the oral temperature taken under the tongue exceeds 37.6 degrees Celsius (°C), shorten the next work cycle by one third. Thermometers that estimate the deep body temperature by measuring the temperature in the ear canal are not considered to be sufficiently accurate to estimate the body core temperature reliably. According the American Conference of Governmental Industrial Hygienists, no worker should be permitted to work when their deep body temperature exceeds 38°C (100.4°F)

Body water loss can be measured by weighing the worker on a scale at the beginning and end of each workday. The worker's weight loss should not exceed 1.5% of total body weight in a workday. If a weight loss exceeding this amount is observed, fluid intake should increase.

2.4.1.2 Cold Stress

Most cases of cold stress develop in air temperatures between 30°F and 50°F. People who are exposed to lower temperatures are at risk for injuries ranging from frostbite to serious loss of body heat, which could result in brain damage or death.

Employees should be protected from exposure to cold so that their core body temperature does not fall below 96.8°F. Core body temperatures below this level will likely result in

reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

Under cold conditions, blood vessels in skin, arms, and legs constrict, decreasing blood flow to extremities. This minimizes cooling of the blood and keeps critical internal organs warm. At very low temperatures, however, reducing blood flow to the extremities can result in lower skin temperature and higher risk of frostbite.

Personnel (including subcontractor employees) potentially exposed to cold stress conditions will be made aware of the signs and symptoms of cold stress, precautionary measures, training, preventive/corrective measures, and first aid procedures.

Signs and Symptoms of Cold Stress

Several factors increase the harmful effects of cold, including drinking caffeinated or alcoholic beverages, smoking, fatigue, emotional stress, certain diseases, medications, wet clothing, having wounds or fractures, and being very young or old. The two most prominent adverse effects from exposure to cold temperatures are frostbite and hypothermia. Treatment for cold related injuries should be administered by a person qualified in first aid or a professional medical provider.

Hypothermia

Hypothermia is the most severe form of cold stress and results from a drop in the body's core temperature. The initial signs include; shivering, numbness, confusion, weakness, impaired judgment, impaired vision, and drowsiness. Hypothermia victims typically progress through five stages of the condition including; (1) shivering, (2) apathy, (3) loss of consciousness, (4) decreasing pulse and breathing rate, and (5) death.

Hypothermia Signs and Symptoms. When the body can no longer maintain core temperature by constricting blood vessels, it shivers to increase heat production. Maximum severe shivering develops when the body temperature has fallen to 95ºF.

The most critical aspect of hypothermia is the body's failure to maintain its core temperature. Lower body temperatures present the following signs and symptoms:

- Persistent shivering--usually starts when core temperature reaches 95ºF
- Irrational or confused behavior
- Reduced mental alertness
- Poor coordination, with obvious effects on safety
- Reduction in rational decision-making

In addition, acute exertion in cold can constrict blood vessels in the heart. This is particularly important for older workers or workers with coronary disease, who may have an increased risk of heart attack.

Hypothermia–Stages of Mild Hypothermia. The early signs of hypothermia include the following:

- Shivering
- Blue lips and fingers
- Poor coordination

Moderate Hypothermia. The next stage of hypothermia includes the following signs:

- Mental impairment
- Confusion
- Poor decision-making
- Disorientation
- Inability to take precautions from the cold
- Heart slowdown
- Slow breathing

Severe Hypothermia. In this advanced stage, hypothermia resembles death. Patients must be treated as though they are alive. The symptoms of severe hypothermia include the following signs:

- Unconsciousness
- Heart slowdown to the point where pulse is irregular or difficult to find
- No shivering
- No detectable breathing

Hypothermia–First aid. To treat hypothermia, stop further cooling of the body and provide heat to begin rewarming, and then do the following:

- Carefully remove the affected individual to shelter. Sudden movement or rough handling can upset heart rhythm.
- Keep the affected individual awake.
- Remove wet clothing and wrap the affected individual in warm covers.
- Rewarm neck, chest, abdomen, and groin, but do not warm extremities.
- Apply direct body heat or use safe heating devices.
- Give warm, sweet drinks, if the affected individual is conscious.
- Monitor breathing. Administer artificial respiration, if necessary.
- Call for medical help or transport the affected individual to University of New Mexico Hospital (see Section 13.0).

2.4.1.3 Frostbite

Frostbite is the most common injury caused by exposure to cold temperatures. It occurs when cells of the body freeze restricting blood flow and causing tissue damage. Frostbite is a common injury caused by exposure to severe cold or by contact with extremely cold objects. Frostbite occurs more readily from touching cold metal objects than from exposure to cold air because heat is rapidly transferred from skin to metal. Body parts most commonly affected by frostbite are face, ears, fingers, and toes. When tissue freezes, blood vessels are damaged. This reduces blood flow and may cause gangrene. Frostbite symptoms vary, are not always painful, but often include a sharp, prickling sensation.

Signs and Symptoms of Frostbite

The first sign of frostbite is slightly flushed skin which then changes to white or grayish-yellow and finally grayish-blue. Pain is sometimes initially felt but is often followed by a cold numb feeling. Once tissues become hard, the case is a severe medical emergency. Severe frostbite results in blistering that usually takes about ten days to subside. Once damaged, tissues will always be more susceptible to frostbite in the future.

Frostbite–First aid. To treat frostbite, exposure to the cold must be halted and the frostbitten area slowly and gently warmed. Treatment includes the following:

- Do not begin warming the affected areas if the individual may be re-exposed to the cold.
- Warm frostbitten area gradually with body heat. Do not rub.
- Do not thaw hands or feet unless medical aid is distant and there is no chance of refreezing. Parts are better thawed at a hospital.
- Apply sterile dressings to blisters to prevent breaking.
- Get medical attention.

Precautionary Measures. To maintain core temperatures above 96.8°F when working in air temperatures below 40°F, employees should wear insulated clothing. This protective clothing may include, but is not limited to:

- Layers of clothing with an air space between the body and the outer layer of clothing to help retain body heat
- Insulated suits, such as whole-body thermal underwear
- Wool or polypropylene socks
- Insulated gloves and boots
- Insulated head cover, such as knit caps, hard-hat liners, etc.

When conducting work in air temperatures below 35°F, the following practices will be followed:

- If the clothing of an employee is expected to become wet, the outer layers of clothing must be impermeable to water.
- If an employee's underclothing becomes wet it must be changed immediately. If the clothing becomes wet from sweating, the employee may finish the task that caused the sweating before changing into dry clothing.
- Consumption of hot liquids, such as soups, warm drinks, etc. will be encouraged. The intake of caffeine-containing products will be discouraged due to their diuretic and circulatory effects.
- The buddy system will be practiced. Any employee observed with signs of cold stress will immediately proceed to the break area.
- Employees will be reminded to layer their clothing, i.e., wear thinner, lighter clothing next to the body with heavier clothing layered outside the inner clothing.

- Avoid overdressing when going into warm areas or when performing activities that are strenuous. This could potentially lead to heat stress situations.
- Auxiliary heated versions of hand wear, footwear, etc., can be used in lieu of mittens, insulated socks, etc. if extremely cold conditions exist.
- Work will be arranged in such a way that sitting still or standing for long periods is minimized.
- If the air temperature is 20°F or below the hands will be protected by mittens or gloves prior to contact with cold surfaces such as metal, etc.
- Keep dry. Wetness greatly increases the chance of cold stress. Always have extra clothing available if there's a chance you could get wet. Keep your feet dry, they are very susceptible to frostbite.
- Take a break. If you become fatigued during physical activity, your body loses its ability to properly retain heat. This causes rapid cooling which can quickly lead to cold stress. When you take a break, be sure to replace lost fluids and calories by drinking warm, sweet, caffeine-free non-alcoholic drinks and soup.
- Learn the symptoms of cold stress. The effects of cold stress may not be apparent to its victim. The first symptoms of hypothermia are uncontrollable shivering and the sensation of cold. The heartbeat slows and may become irregular, and the pulse weakens. As the condition worsens, severe shaking or rigid muscles may be evident. The victim may also have slurred speech, memory lapses, and drowsiness. Cool skin, slow, irregular breathing, and exhaustion occur as the body temperature drops even lower. This is a serious condition requiring immediate medical attention.

2.4.1.4 Wind Chill

Air temperature is not the only factor to be considered while evaluating cold stress situations. Wind chill involves the combined effect of air temperature and air movement. Wind-chill cooling rate is defined as heat loss resulting from the effects of air temperature and wind velocity upon exposed skin. Wind-chill cooling rate and the cooling power of air are critical factors. The higher the wind speed the greater the risk of experiencing cold-related injuries.

Table 2-2 compares the effects of air temperatures with and without wind. For example, when the air temperature is -20°F there is little danger of flesh freezing with no wind, increased danger with a wind of five miles per hour (mph), and extreme danger with a wind of 25 mph or more. For exposed skin, continuous exposure should not be permitted when the air speed and temperature result in an equivalent chill temperature of –25°F or less. Table 2-2 can be used to help assess hazardous conditions attributable to wind-chill effects.

Table 2-2: Wind Chill

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

2.4.2 Inclement Weather

Inclement weather, such as severe thunder/lightning storms and high winds, can have a significant impact on personnel safety and the safe performance of site operations. Site personnel will be briefed each morning to inform them of any potential weather hazards that may be present during the day and will remain alert to the onset of inclement weather. The hazards associated with inclement weather include:

- **Heavy Rain:** The monsoon season in New Mexico lasts from mid-June through the end of September. Heavy rain can create working and driving hazards of which site personnel should be aware. This includes the increase in slip and fall hazards due to slick walking surfaces and reduction in visibility. Additionally, heavy rains can cause flash flooding in low-lying areas and creek and river areas. In the event that heavy rains occur while personnel are outside, the SSHO will advise the teams to halt operations and instruct personnel to seek shelter. The decision to re-start operations will be the responsibility of the PM who will consult with the SSHO to ensure site conditions are safe for re-entry and continuation of operations.
- **Thunderstorms:** Thunderstorms, with their associated lightning, present a significant hazard to site personnel. A severe thunderstorm watch indicates that severe thunderstorms are possible in and close to the watch area. A severe thunderstorm warning indicates that a severe thunderstorm has been spotted and is going to move through the area soon. Work may continue at the work site during severe thunderstorm watches; however, site work will cease and the work zone will be evacuated during a thunderstorm or severe thunderstorm warning. Additionally, work will be halted by the SSHO if lightning is detected within ten miles of the team locations.
- **High Winds:** High winds can create conditions that threaten the safety and health of site personnel, and if coupled with low humidity, can create a static electricity hazard. High winds can cut visibility by creating dust clouds and can cause trees and tree limbs to fall. The SSHO will determine when wind levels present a hazard to site personnel and will call for the evacuation of the work areas, if deemed necessary. The decision to restart operations will be the responsibility of the PM in consultation with the SSHO to ensure site conditions are safe for re-entry and continuation of operations.
- **Tornados:** Tornados with their associated high winds, rain, and potentially damaging hail can create serious threats to personnel on site. If a tornado watch is reported, conditions are favorable over a large area for severe thunderstorms and tornadoes to develop, and the SSHO will notify all personnel of the danger. In the event that a tornado watch is upgraded to a tornado warning, a tornado has been detected or seen, is on the ground, moving, and is expected to move through the affected area soon. If a tornado warning is sounded, the SSHO will instruct personnel to evacuate the site immediately and take cover. Environmental clues to look for include: dark, often greenish sky; large hail; a wall of clouds; and strong winds with a loud roar, sounding similar to a freight train.

All of these weather conditions present significant hazards to personnel due to windblown debris, drowning, and/or electrocution. Resulting injuries can include contusions, abrasions, thermal/electrical burns, broken bones, and possibly death. Site equipment can also be damaged due to high winds, flying debris, and/or lightning strikes.

Control(s). The best protection against most severe weather episodes is to avoid potential exposure. This avoidance means seeking shelter before the storm hits. Stay away from pipes and electrical equipment should lightning be a threat, and watch for damage caused by lightning strikes nearby. The SSHO will monitor/observe weather conditions and determine if work activities are to be altered and/or suspended. The SSHO will decide what operations, if any, are safe to perform based on existing conditions and anticipated conditions.

2.4.3 Slip, Trip, and Fall Hazards

The FWDA project area topography varies greatly, ranging from rolling hills, drainage channels, and steep inclines. In addition, improperly stored tools/equipment may present some form of slip, trip, and or/fall hazard to site personnel. It should also be noted that there may be many rodent burrows (prairie dog, snakes, and other animals) adding to such hazards; however, the burrows will not necessarily be marked. Resulting injuries can include contusions, abrasions, twisted ankles/wrists, sprained backs, pulled muscles, and broken bones.

Control(s). When walking, look for stable places to step into. Good housekeeping, including cleaning up of tools and equipment when not in use in a timely manner, will be practiced at all times by site personnel to reduce potential for slip, trip, and fall hazards. This includes site cleanup, plant and brush removal, and other improvements as necessary. Open trenches, boring holes, and other significant slip/trip hazards need to be identified by the SSHO and clearly marked, or barricaded during performance of project activities to the extent feasible. All equipment (e.g., hand tools, monitoring equipment) will be properly stored when not in use.

2.4.4 Cut and Abrasion Hazards

Cuts and abrasions can result from numerous site activities, including handling equipment, potholing, inadvertently striking sharp edges of equipment, use of knives, hand augers, and lifting manhole covers.

Control(s). Site personnel need to wear appropriate gloves, exercise caution when working near equipment with sharp edges, and request assistance when handling large and/or cumbersome objects. When using knives, site personnel need to cut away from the body, whenever possible.

2.4.5 Hand Tools Hazards

Use of hand tools, including scrapers and brushes, and electric/fuel-powered tools can present many hazards, including cuts, piercing of skin, flying debris, pinching, soft tissue damage (e.g., eye injuries), contusions, and dismemberment.

Control(s). Site personnel are to ensure that tools being used are in good working order and that all required shields, guards, and safety devices are in place. When using knives or similar tools, site personnel should perform cutting motions away from the body whenever possible. Training will be conducted for site personnel not familiar with the use of common hand tools.

2.4.6 Material Handling Hazards

Material handling can include lifting of equipment, trash, and/or debris. Handling of materials can present numerous hazards, including slips/trips/falls, strains, and sprains. Back injuries are of particular concern due to their potential for long-term, or permanent, disability.

Control(s). Site personnel need to use safe lifting procedures when handling materials (e.g., keep back straight, don't twist upper torso while lifting/carrying, and ask for assistance for lifting of heavy items). Site personnel should also plan a travel path prior to initiating work.

2.4.7 Noise Hazards

Operation of electrical generators and gas-powered equipment can be significant sources of hazardous noise. Depending upon the noise intensity, and duration of exposure, site personnel may incur temporary and/or permanent hearing loss. Note: If normal speech is impeded between two individuals approximately three feet apart, hearing protection is needed.

Control(s). The SSHO will not perform noise surveys to determine where hearing protection is required and what type of hearing protection is to be worn (e.g., ear plugs, ear muffs). As the amount of work in proximity to hazardous noises is very limited at this site, the SSHO will require ear plugs to be worn around generators and gas-powered equipment within 20 feet of the operating device, and will coordinate installation of appropriate postings to advise site personnel of potential noise exposure hazard(s). Site personnel will advise the SSHO of any potential noise exposure concerns.

2.5 BIOLOGICAL HAZARDS

The location of FWDA in the desert southwest presents several hazards associated with indigenous biological species. The SSHO will inform site personnel during tailgate safety briefings as to the potential biological hazards that may be encountered.

Animal Hazards

Several poisonous invertebrates and reptiles are found within FWDA. These include scorpions (which live under rocks and debris), fire ants (which live in large mounds of dirt or sand on the land surface), and rattlesnakes (which may be found in burrows, heavy brush, and under rocks, logs or debris). To avoid these animals, field personnel will be instructed to not pick up or roll boulders or logs with hands or feet. Personnel will also be instructed to stay away from large mounds of dirt or sand (potential fire ant hills). Similarly, reaching into burrows, heavy brush or other debris where these animals hide will not be permitted. If the investigation requires entering areas where these animals could live or be hiding, caution should be used to prevent bites or stings.

Ticks

Rocky Mountain Spotted Fever (RMSF) is a disease transmitted by ticks and occurs during spring, summer, and fall. This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (*Rickettsia rickettsii*) becomes reactivated and can infect humans.

The primary symptom of RMSF is the sudden appearance of a moderate to high fever. The fever may persist for two to three weeks. The victim may also have a severe headache, deep

muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death if untreated, but if identified and treated promptly, death is uncommon.

Control(s). Tick repellant containing diethyltoluamide, commonly known as DEET, should be used in tick-infested areas, and pants legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the *Rickettsia* into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth-parts in the skin. Hands should be protected with surgical gloves when removing ticks.

Hantavirus

Hantavirus is a disease of the respiratory system, which was first identified in the southwestern United States in 1993. There have been 93 confirmed cases of hantavirus in New Mexico between 1993 and 2014 (Centers for Disease Control and Prevention [CDC], 2014). The disease is a response to inhalation of rodent saliva, urine, and feces in an aerosol form. Disease transmission may also occur when these dried materials are ingested, contacted with the eyes, or absorbed through cuts and breaks in the skin. The disease results in fever, muscle pain, coughing, and acute respiratory distress. Approximately 639 cases have been confirmed in 34 states since the disease was first identified in 1993. Of this number, 36 percent of infected individuals have died. This virus has been classified as a biosafety level four (the maximum level) agent for viral growth research. Personnel may also come in contact with rodents and their excrement in buildings, toolboxes, and vehicles. Personnel will not attempt to pick up or capture rodents to reduce the risk of being bitten. Rodent nests and droppings in buildings should be disinfected with a commercial disinfectant containing hypochlorite, detergent, or ethyl alcohol. Personnel will minimize dust generation and will not dry sweep or vacuum in areas of suspected rodent activity.

Poison Oak, Ivy, and Sumac

Poison ivy, poison oak, and poison sumac are identified by three or five leaves radiating from a stem. Poison ivy is in the form of a vine while oak and sumac are bush-like. All produce a delayed allergic hypersensitivity. The plant tissues contain an oleoresin, which is active in live, dead, and dried parts. The oleoresin may be carried through smoke, dust, contaminated articles, and the hair of animals. Symptoms usually occur 24 to 48 hours after exposure resulting in burning or stinging, and weeping and/or crusted blisters. Should exposure to any of these plants occur, first wipe the affected area with rubbing alcohol then wash the affected area with a mild soap and water. Do not scrub the area. The best antidote for poisonous plants is recognition and avoidance.

There are over-the-counter products designed for application before exposure and after potential exposure to toxic plants. Some prevent the plant oleoresin from contacting the skin, some are used after potential exposure to wash the skin, and others are used to treat symptoms of exposure. The use of these creams is not required, as some may be sensitive to such products. In extreme cases, prescription steroids may be used to reduce the allergic reaction. The SSHO will be notified of the presence of such plants and the use of upgraded PPE will be considered.

2.6 VEHICLE OPERATIONS HAZARDS

Vehicle operation is one of the largest physical hazards at FWDA. Field teams constantly utilize vehicles to mobilize from site to site and across the facility. Several contractors also have independent operations ongoing at FWDA, with crews using the road network to get to their respected site locations.

Moving Vehicles

Vehicles, mainly trucks and heavy equipment, are used to move from one location to the other, and also in aiding with field work. Drivers must use safe driving practices as well as watching out for other vehicles in the area. Speed limits within the Administration Area are not readily posted or enforced, but Sundance personnel should abide by a 25 miles per hour (mph) speed limit within this area. Once inside the Gate 51 area, some roads are paved and should be traveled with caution at a rate of speed that is safe for that road, not to exceed 45 mph. Many roads inside Gate 51 are dirt, and should be traveled with caution at a rate of speed that is safe for that road, not to exceed 30 mph.

Pedestrians

Work areas within the Administration Area and within the Gate 51 boundary are adjacent to traversable roads and crossings. Pedestrians should always keep watch for moving vehicles and heavy machinery in proximity of the work area. While operating a vehicle the operator should keep watch for pedestrians performing tasks adjacent to the roads and crossings. Upon noticing a moving vehicle or heavy machinery entering a work area or in proximity of pedestrians, make eye contact with the vehicle operator to verify that they see you; therefore, always avoid standing or working in the blind spot of any vehicle or machinery. If you cannot see the operator, the operator cannot see you.

3.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

Details regarding staff organization, qualifications, and responsibilities are provided in Section 3.0 of the APP for this project. Safety responsibilities, accountability, and lines of authority are discussed in Section 13.0 of this SSHP.

4.0 TRAINING REQUIREMENTS

Personnel assigned to, or regularly entering the project site, will receive the training required in this section prior to participation in assigned site activities that pose a potential for exposure to safety or health hazards. Site personnel will also receive the training outlined in this section as applicable to their assigned duties. Documentation of relevant training will be maintained at the Sundance field office and at the Sundance Albuquerque office.

UXO field personnel will comply with EM 1110-1-18 and be credentialed in accordance with Department of Defense Explosives Safety Board Technical Paper 18 (2004). All personnel will be fully trained and capable of recognizing the specific hazards of the procedures being performed.

4.1 GENERAL TRAINING

Sundance will conduct training on the chemical, physical, and biological hazards for this project during tailgate safety meetings held at project or office locations prior to the commencement of field activities.

The SSHO will be responsible for informing all personnel performing onsite activities and all visitors of the contents of this SSHP and ensuring that each person signs the SSHP acknowledgment form before any activities onsite are conducted. By signing this form, individuals recognize the hazards present on the site and the policies and procedures required minimizing exposure to hazards or adverse effects caused by hazards. Untrained employees may be restricted from sites where the potential for exposure exists as determined by the SSHO.

4.2 40-HOUR GENERAL SITE WORKER TRAINING

Sundance and subcontractor personnel with the potential for exposure to hazardous substances or other safety and health hazards during the course of this project must obtain 40 hours of offsite OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) training. This training must be completed, and documentation presented, before personnel are to participate in site activities involving exposure to site hazards. Visitors not performing intrusive activities are not required to have HAZWOPER training.

4.3 SUPERVISED FIELD EXPERIENCE

Sundance personnel will receive a minimum of three days actual field experience under the direct supervision of a trained, experienced supervisor. This training will be used to familiarize site personnel with the site-specific organization, PPE, and emergency response procedures. This supervised field experience will be documented and maintained within the respected personnel files.

4.4 8-HOUR ANNUAL REFRESHER TRAINING

Sundance and subcontractor personnel, to include management/supervisory personnel will receive a minimum of eight hours of refresher training annually. This training will cover relevant topics from the 40-hour HAZWOPER, as well as critiques of any incidents that have occurred in the past year and any other related topics.

4.5 TAILGATE SAFETY MEETINGS

The SSHO or the Field Team Leader (FTL) will conduct a tailgate safety meeting for all personnel at the beginning of each work shift or whenever new employees arrive at the job site once the job commences. The topics discussed at the tailgate safety meeting will include H&S considerations for the day's activities, necessary PPE, problems encountered, and new operations. Attendance records and meeting notes will be maintained with the project files. At the conclusion of each shift, a debriefing for site employees will be held, if necessary.

4.6 SITE-SPECIFIC INFORMATION TRAINING

Sundance will provide site-specific training for personnel assigned to projects falling within the RFI and application of 29 CFR 1926.65. The content of the training will be derived from information contained within this SSHP. Workers must also read and sign the SSHP acknowledging acceptance of site rules and understanding of site hazards before being permitted to enter an EZ. Emergency procedures will be reviewed during this training.

4.7 VISITOR TRAINING

Sundance will limit site access by delivery or repair personnel, public or government officials, visitors, or local residents to support areas only. These persons will not be required to comply with the medical and training requirements as previously defined. Authorized visitors will be briefed on the hazards present at that location by the SSHO or OESS. Visitors will be escorted at all times. Visitors are responsible for compliance with the requirements specified in this SSHP.

4.8 HAZARD COMMUNICATION

In order to comply with the OSHA Hazard Communication (HazCom) Standard 29 CFR 1910.1200 and to ensure that site personnel are informed of the hazards associated with the materials with which they work, the following requirements will apply to all commercial products containing hazardous substances that are brought on site:

- SDSs will be maintained for any product containing a hazardous substance that will be used on site.
- Containers not supplied with adequate hazard labeling will have a hazard communication label affixed to the container detailing the health and physical hazards associated with the material.
- Personnel, including subcontractors who work with products containing hazardous substances, will be trained in accordance with the requirements of 29 CFR 1910.1200.
- An inventory of products containing hazardous substances used on site will be maintained.

This training will be provided upon initial assignment to the site and prior to use of the product. Supplemental HazCom training will be scheduled and presented whenever a new hazardous substance is introduced into the work area or an employee changes job location where new products are encountered.

4.9 FIRST AID AND CARDIOPULMONARY RESUSCITATION

At least two persons trained in both 1) American Red Cross first aid techniques and 2) cardiopulmonary resuscitation (CPR) will be on site during all activities at the FWDA project site. Medical support will be provided on site by first aid and CPR-qualified first responders until emergency responders arrive to the site.

4.10 BLOODBORNE PATHOGEN TRAINING

The Sundance first aid-trained personnel will primarily be responsible for rendering aid in the event of an injury or accident. The first aid/CPR trained personnel who have a potential for occupational exposure to blood or other potentially infectious body fluids will receive training as outlined in the 29 CFR 1910.1030(g)(2). Whenever feasible, all onsite Sundance personnel will receive the same level of blood borne pathogen training as specified above.

5.0 PERSONAL PROTECTIVE EQUIPMENT

This section provides guidelines for selection of appropriate PPE in accordance with 29 CFR 1910.120 (g) (5), 1910.132, and 1910.134. Environmental and personal monitoring will be conducted to identify health hazards to determine the appropriate level of employee protection needed.

Level A, Level B, and Level C protection are not anticipated for the Parcel 3 Groundwater RFI Work Plan scope of work.

Level D Protection

Level D PPE will be used for this project, as there are no skin hazards are present at the project site. Level D PPE will consist of the following for the tasks described in Section 2.0.

- Street clothes or coveralls (to include long pants/trousers and sleeved shirts)
- Safety-toed work boots
- Safety glasses
- Leather work gloves
- Hardhat (to be used if only there is an overhead hazard)
- Reflective safety vest
- Hearing protection (as needed during heavy equipment operation)

If additional skin protection from poisonous plants, decontaminating operations, and/or other water sampling related activity is required, then the above Level D PPE ensemble will be supplemented to a modified Level D PPE.

5.1 EMERGENCY RESPONSE EQUIPMENT

Emergency and first aid equipment will be available at all times. The team support vehicle will be designated as an emergency vehicle and as a safe haven. Table 5-1: *Emergency Response Equipment* presents a list of emergency and first aid equipment needed on site.

Table 5-1: Emergency Response Equipment

Emergency Equipment	Number per Location	Location Stored
Nitrile gloves (100 count box)	2	Field Vehicle
Emergency blankets (reflective)	2	Field Vehicle
First aid Kit (w/bloodborne pathogens)	1	Field Vehicle
Fire extinguisher (Type ABC)	1	Field Vehicle
Portable eye wash kits	1	Field Vehicle
Burn kits with bandages	1	Field Vehicle
Trauma bandages (packages)	1	Field Vehicle
Safety flagging/caution tape	1	Field Vehicle
Sunscreen (minimum SPF 50)	1	On person/Field Vehicle

6.0 MEDICAL SURVEILLANCE PROGRAM

Sundance field personnel participate in a Medical Surveillance Program (MSP) designed to assist in the prevention, diagnosis, and treatment of occupational illnesses and injuries sustained during operations on hazardous waste sites. This program is initiated when the employee starts work with a complete physical and medical history and is continued on a regular basis. The medical surveillance requirements of this section will apply to all site personnel with exposure potential to significant safety and health hazards.

6.1 GENERAL REQUIREMENTS

Medical examinations of personnel as required by the MSP will be conducted by, or under the supervision of, a licensed physician, who is board-certified in occupational medicine or has had extensive experience in the recognition, evaluation, and treatment of occupational diseases.

Physicians Statement

Upon completion of a health assessment, the physician will provide the results of the examination to the employee, and a written physician's statement will be provided to Sundance. The physician's statement will, at a minimum, include the following:

1. The employee's name and social security number;
2. A statement that the employee is qualified to participate in HTRW-related site activities;
3. The physician's recommended limitations upon the employee's assigned work, if any; and
4. Any supplemental or follow-up examinations or tests, which the physician believes are required to complete the assessment.

6.2 SUBCONTRACTOR REQUIREMENTS

Subcontractors who may be required to work in an EZ will certify that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations will meet the requirements of 29 CFR 1926.65. Subcontractors will also supply copies of the medical examination clearance certificate for each employee they have on site. One subcontractor staff member will be trained in first aid/CPR.

6.3 PERSONNEL MEDICAL RECORDS

Sundance will maintain medical and personal exposure monitoring records according to the requirements of 29 CFR 1926.65 and will be kept for a minimum of 30 years. Confidentiality of employee medical records will be maintained. The written medical opinion from the occupational physician will be made available upon request to the USACE representative for any site worker.

6.4 MEDICAL RESTRICTIONS

When a medical care provider identifies a need to restrict work activity, the employee's home office will communicate the restriction to the employee, the PM, and the SSHO. The terms of

the restriction will be discussed with the employee and the SSHO. Every attempt will be made to keep the employee working, while not violating the terms of the medical restriction.

7.0 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

Onsite monitoring will be conducted during specified site activities to evaluate potential hazards that may be encountered. The onsite monitoring will assist in determining the effectiveness of control measures, the need for upgrading or downgrading PPE requirements, and the effectiveness of standard work procedures. Direct-reading, real-time instruments will be used whenever possible, or required, to detect and qualify site hazards. If a reading is achieved which exceeds the action levels specified in the following sections, the SSHO will take the steps outlined in this section, or other referenced sections, to correct the situation or minimize the exposure.

7.1 PERSONAL MONITORING REQUIREMENTS

Thermal and noise exposure are the only associated hazards related to this field effort that require personal monitoring. Breathing zone monitoring is not anticipated during this field effort.

7.2 TEMPERATURE EXTREME MONITORING

Heat and cold stress monitoring will be conducted in accordance with the guidelines presented in Section 2.4: *Physical Hazards*. This monitoring will be conducted at the direction of the SSHO or another designated qualified person and will be used to minimize physiological effects in the event that temperature extremes are experienced during site operations.

7.3 NOISE MONITORING PROCEDURES

High noise levels may be anticipated during drilling activities and the use of generators and gas-powered equipment (e.g., weed trimmers). Exposures above 85 decibels as recorded in the A-weighted sound level (also known as dBA) may likely be experienced during these activities; therefore noise levels will not be monitored. In place of monitoring, a general hearing protection requirement around this equipment will be enforced. Personnel within 20 feet of drilling activities, or operating generators and/or gas-powered equipment will be required to wear hearing protection.

8.0 HEAT AND COLD STRESS

Information regarding heat and cold stress has been included under Section 2.4 of this SSHP.

9.0 STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS, AND WORK PRACTICES

- Mark or barricade the site as necessary to prevent unauthorized visitors without hindering emergency services.
- Barricade all open holes, trenches, and obstacles in accordance with site needs. These needs will be determined by proximity to traffic ways, both pedestrian and vehicular,

of the hole, trench or obstacle. If holes are required to be left open during non-working hours, they will be adequately decked over or barricaded and sufficiently lighted.

- Identify underground utilities before conducting any digging or boring operations.
- Smoking and ignition sources in the vicinity of potentially flammable or contaminated material are prohibited.
- Exercise care with tools and equipment that may be sources of ignition when working in areas where flammable vapors may be present. All tools and equipment must be properly bonded and/or grounded.
- Personnel must wear approved and appropriate safety equipment (as specified by a qualified individual [e.g., the SSHO).
- No smoking, eating, drinking, or chewing of tobacco will be allowed in contaminated areas.
- Keep contaminated tools and hands away from the face.
- Each sample must be treated and handled as if it were contaminated.
- Horseplay is prohibited in the work area.
- Work while under the influence of intoxicants, narcotics, or controlled substances is prohibited.
- Work permits (e.g., for radioactive work, hot work, excavation, and confined space) will be obtained as necessary for each task.
- Specific material handling procedures, as well as drum/container handling procedures and precautions, will be specified in project-specific addenda.
- Seatbelts will be worn at all times when operating motor vehicles.

9.1 WORK PROCEDURES IN PRESENCE OF MEC

Information regarding work procedures in the presence of MEC is described in Section 2.1.2 above.

9.2 USE OF PRODUCTS CONTAINING HAZARDOUS MATERIALS

Because of the nature of products used on site and the manner in which they will be used, it is not anticipated that there will be a potential for airborne exposure to the hazardous materials used on site. However, some products used have the potential for skin contact hazards. To help ensure personnel safety from hazardous materials, site personnel will follow the safe work practices listed below:

- To determine the chemical properties of the hazardous materials and the protective measures to be used, all site personnel who use will personally review the SDS for each product used.
- All products with airborne exposure hazards (i.e., gasoline and other fuels, spray paints, etc.) will be used outdoors or in well-ventilated areas, and personnel will stand upwind of the dispensing point when dispensing the product.

- When using or dispensing a product with a skin contact hazard, personnel will utilize protective gloves, as identified in Section 5.0: *Personal Protective Equipment* of this SSHP. Only those personnel, who have received appropriate HazCom training, as outlined in Section 4.8: *Hazard Communication* of this SSHP will use a product containing hazardous materials.

Personnel will immediately wash any affected skin that accidentally comes in contact with a hazardous material identified as being a skin contact hazard.

Site Control Measures. To prevent both exposure to unprotected personnel and migration of contamination due to tracking by personnel or equipment, work areas and required personal protective equipment will be clearly defined.

9.3 CENTER OF OPERATIONS

Building 34 (old Fire Station), an existing building in the Administration Area of FWDA, will be used as a field office. In the event of a site accident involving the total evacuation of site personnel, the field office at Building 34 will act as the primary staging area for accountability, with the gate to the Administration Area (Gate 109) serving as a secondary assembly area for the final personnel count and evacuation. The checkpoints will be located so as to minimize the potential for contaminants to migrate into these locations.

9.4 SECURITY PROCEDURES

Project site access and security will be via existing access roads and fences/gates, and augmented as needed with the use of signs and barricades. For site operations Sundance will establish work zones as described below. These work zones will ensure that personnel are properly attired in PPE to mitigate the hazards associated with the site and that only those personnel with the experience and training are permitted in the areas where exposures to site hazards could exist.

9.5 EXCLUSION ZONE

The EZ is a work area where the greatest hazard potential for exposure to safety and health hazards may be, or is known to exist. EZ entry and exit control points will be established to regulate the flow of personnel and equipment into and out of the EZ. This will ensure that personnel and equipment are protected and that contamination located inside the EZ is properly contained. The entry/exit control points will be established upwind from the EZ to prevent airborne contaminants from migrating into "clean" areas. The site's prevailing wind direction will be used to select the entry/exit control points, but alternate entry/exit points need to be available in the event that the wind direction changes or an emergency arises which precludes the use of the primary entry/exit point. No tobacco product use, eating, drinking application of cosmetics or other hand–to–face activities are allowed in this area unless strictly specified in the SSHP.

It may become necessary, during hot weather conditions, to modify the restrictions on drinking in the EZ. This may be accomplished by establishing a break area inside the EZ, upwind from the work site, which is accessed through a scaled down version of the personal decontamination station. Personnel would be allowed to enter this area to drink cool fluids and rest. This modification may be implemented if proper procedures are established, and if approved by the SSHO.

9.6 SUPPORT ZONE

The Support Zone (SZ) is the area outside the EZ and is the location of the administrative and other support functions required to keep the operations in the EZ functioning smoothly. The SZ includes facilities such as the change area, lunch and break areas, office trailer, and supply storage areas. Personnel in the SZ can wear normal work clothes since this area is designated as the clean area and contaminated equipment and clothing must be decontaminated before leaving the EZ. The SZ is designated as the tobacco product use, eating, and drinking area. The location of the support facilities inside the SZ should be selected through careful consideration of the following:

- Site layout, including topography, open spaces and available access roads;
- Location of utilities, such as power, telephones and water;
- Line-of-sight to all activities in the EZ, if applicable;
- Wind direction (the SZ should be located upwind from the EZ); and
- Distance from the EZ (i.e. not more than 100 meters to the SZ if possible).

9.7 EQUIPMENT STORAGE AND SECURITY

During non-working periods, project equipment used onsite, to include hand tools, will be stored, in designated storage facilities located at the designated field office (Building 34).

9.8 SITE MAPS

Prior to initiation of site activities, a site map will be available which will detail the following information: site size and shape; restricted areas; designated assembly points; the site access routes; staging areas; and any other information deemed necessary by the SSHO. The site map will be used by the SSHO during site safety training and the daily safety briefings, and by field teams to locate and orient work locations.

9.9 SITE COMMUNICATIONS

Effective onsite and offsite communication is an integral part of site control and will be established prior to initiation of site activities. Onsite communication will be used to coordinate site operations; maintain site control; pass along safety information, coordinate work/rest periods, etc.; and alert site personnel to emergency situations. Means of communicating with offsite resources will be available at all times to ensure effective communication with offsite management personnel and emergency response services. All site personnel will be familiar with the different methods of both onsite and offsite communication. The methods Sundance will use for onsite and offsite communication will include:

- Onsite communications consisting of USACE-provided radios, Sundance-provided portable radios, and cellular telephones or hand signals as needed for communications.
- Offsite communications will be accomplished using the office hard line phone or cellular telephones. Each team will have two means of communication for summoning offsite support.

9.10 BUDDY SYSTEM

Personnel will employ the buddy system during operations. This system requires that a partner, or buddy, accompany each worker. The buddy provides the co-worker/partner with assistance, observes the partner for signs of exposure, periodically checks the integrity of the partner's PPE, and notifies the SSHO or OESS if help is needed. The buddy must be in a line of sight or hearing of the partner and be prepared to enter any area the partner enters. The buddy must be fully certified to work in the level of protection that the employee is working in, and must have the appropriate PPE available.

10.0 PERSONAL HYGIENE AND DECONTAMINATION

Sundance will establish personnel decontamination facilities to ensure that personnel maintain a high degree of personal hygiene and minimize exposure to chemical and biological hazards. If required, the personnel decontamination area will be established immediately outside the EZ to facilitate decontamination and PPE removal.

Level D Decontamination

Decontamination procedures are not required for Level D protection. The following decontamination procedures will be followed for modified Level D PPE:

- Remove outer leather gloves
- Remove outer Tyvek™ coveralls and dispose of in the proper receptacle
- Remove nitrile gloves and dispose of in the proper receptacle
- Wash hands and face before eating, drinking, or smoking

The SSHO will also determine if personnel wearing modified Level D PPE will be required to shower. This decision will be based on the potential for PPE breakthrough and other subjective information. Personnel are required to wash hands, face, and other exposed skin areas before leaving the EZ for breaks or lunch. Towels, washcloths, and soap, will be provided to personnel.

Sanitation

Basic sanitation provisions for all employees will be provided in all places of employment as specified in EM 385-1-1. An adequate supply of drinking water will be provided in all work areas. Cool water will be provided during hot weather. Bottled water will be kept in coolers and will accompany field teams to all site locations. Drinking water will be labeled as such, and segregated from non-potable water.

Bathroom facilities are located on FWDA, and are accessible. Portable toilets will also be provided at the field office for groundwater operations personnel to utilize. These facilities include toilets and hand wash stations.

Trash bags will be provided to each field team and will serve as the team's trash receptacle. At the end of the shift/day, all trash will either be removed from the site or emptied into an onsite central storage container that will be tightly closed each night prior to departure from the site. As previous activities have shown no hazardous waste contamination to disposable PPE, all trash will be consolidated and disposed of, as stated above.

Site Housekeeping
All work areas will be maintained in a clean/neat fashion, free of loose debris and scrap. Any materials/equipment not being used will be removed and stored, or disposed of accordingly. Groundwater and soil IDW will be properly containerized and disposed of in accordance with the waste disposal procedures presented in the Parcel 3 Groundwater RFI Work Plan.

11.0 EQUIPMENT DECONTAMINATION

Equipment used in the field, to include PPE, will be cleaned and inspected at the end of each workday to ensure that the equipment is maintained in safe operating condition. Any equipment found to be defective will be brought to the attention of the PM or SSHO. Tools and equipment used in the EZ will be kept free of accumulations of soil and other debris and will be cleaned prior to their removal from the EZ. Hand and sample equipment will be decontaminated using an equipment decontamination station. Any wash and rinse solutions and debris associated with the equipment decontamination will be containerized as IDW and disposed of in accordance with the waste disposal procedures outlined in the Parcel 3 Groundwater RFI Work Plan. Prior to the start of operations where equipment could become contaminated, the SSHO will ensure that equipment decontamination stations are established and ready to use.

12.0 EMERGENCY EQUIPMENT AND FIRST AID

Emergency response equipment will be on site at all times, as discussed, herein:

First aid Response
At least two employees onsite will hold a current certificate in American Red Cross or American Heart Association Standard First aid. This training provides 6.5 hours of adult CPR and basic first aid. If a medical emergency exists, personnel will consult the emergency phone number list and request an ambulance immediately. Perform first aid/CPR as necessary, stabilize the injured, decontaminate if necessary, and extricate only if the environment they are in is dangerous or unsafe and only if the rescuers are appropriately protected for potential hazards they may encounter during the rescue. When emergency services personnel arrive, communicate all first aid activities that have occurred. Transfer responsibility for care of the injured/ill to the emergency services personnel. The following items and emergency response equipment will be located within easy access at all times:

- First aid kit and bloodborne pathogen infection control kit.
- Eyewash–an appropriate amount of portable sterile eyewash bottles will be available on site for flushing foreign particles or contaminants out of eyes. An eyewash kit will be located in all field vehicles and at the designated project trailer. The SSHO will demonstrate the proper operation of the unit(s) prior to the start of work.
- Emergency phone numbers list.
- Hospital route map.
- Cellular phones and/or portable radios for emergency communications in remote areas.
- Type ABC fire extinguishers to contain and extinguish small fires. The local or facility fire department will be summoned in the event of any fire on site.

- Drugs, inhalants, or medications will not be included in the first aid kit.

12.1 SPILLS OR LEAKS

If a spill at the site is observed, Sundance will immediately notify the USACE site representative and follow the procedures listed in Section 13.0: *Emergency Response Plan and Contingency Procedures.* An assessment will be made of the magnitude and potential impact of the release. Sundance will maintain the following equipment and materials for use during spill response activities:

- Absorbent pads
- Granular absorbent material (noncombustible)
- Polyethylene sheeting
- Shovels and assorted hand tools

12.2 FIRES

Fire extinguishers will be kept onsite for the duration of field activities. Prior to the beginning of work, the SSHO will inspect the fire extinguishers to ensure that they are operable and meet OSHA requirements.

13.0 EMERGENCY RESPONSE PLAN AND CONTINGENCY PROCEDURES

Thorough pre-planning, proper design, and implementation of the required emergency response contingencies can dramatically reduce the frequency and severity of emergencies. If an emergency does occur, quick, decisive action will be required since even short delays can create or escalate life-threatening situations. To ensure rapid, effective response to a site emergency, the procedures and contingency plans outlined in this section will be implemented prior to and during the conduct of any site activities involving exposure to safety and health hazards.

13.1 PRE-EMERGENCY PLANNING

During the development of the AHAs, potential health and safety hazards associated with the performance of site activities will be identified. Once identified, these hazards will be assessed to determine the risk that these hazards could result in an emergency situation. Contingency plans for responding to the potential emergency situations have been developed and are included in this SSHP.

Prior to commencing site operations, site personnel will contact and meet with appropriate local authorities to inform them of the site activities to be performed under this SSHP and the potential hazards that these activities pose to site personnel, the environment, and the public. The PM and SSHO will confirm information from the local authorities related to the type of emergency services available, including any contact phone numbers or procedures needed to summon the services. The SSHO will be responsible for ensuring that the telephone numbers and procedures for contacting local emergency services are posted as requirement in this section.

13.2 EMERGENCY RESPONSE TEAM

The emergency response team will be comprised of project team members and offsite organizations. The first level of response will come from the SSHO. The SSHO will be trained in first aid and CPR and have the capacity and authority to call for a second level of response. The second level responders will include outside organizations such as emergency medical responders, tribal and state police, and wild land fire response. Project team members, under direct supervision of the SSHO, will attempt to control/extinguish small fires with onsite fire extinguishers, while the fire department is being summoned to the location of the fire. The SSHO will only allow qualified individuals to take part in the emergency response actions.

13.3 PERSONNEL ROLES AND LINES OF AUTHORITY

The roles and responsibilities of personnel for response to emergencies at the FWDA project site will be clearly defined and coordinated with subcontractors and the USACE COR. The responding Fire Department (911) will evaluate the emergency situation and make the determination whether to involve a Hazardous Materials Unit in the response. The responsibilities of specific project individuals and the coordination of the responding Fire Department are defined in the following sections.

SSHO

Upon notification of an emergency situation, the SSHO will assume the role of the Onsite Incident Commander. As the Onsite Incident Commander, the SSHO will have overall responsibility for coordinating the efforts of the onsite response actions, as well as the offsite emergency response agencies. Additionally, the SSHO will ensure that required offsite emergency services have been summoned and will also be responsible for notifying and coordinating all relevant Federal, state and local regulatory and response agencies. In the event that the SSHO is incapacitated, the designated site personnel will assume the duties of the SSHO.

Project Manager

The PM will provide support to emergency responders and dedicate appropriate project resources to the response effort. If required, the PM will mobilize additional personnel and equipment to the site.

Emergency Response Services, Contacts, and Notification

During site activities, site personnel will act, to the greatest extent possible, in the role of onsite emergency response personnel. The SSHO will designate the personnel assigned to emergency response tasks prior to initiation of site activities involving the potential for an onsite emergency. Onsite emergency response personnel will receive training in the response actions that they will be authorized to, and may be directed to, perform during a site emergency.

The primary means of obtaining offsite emergency services will be through the phone notification of the emergency services and contacts listed in Table 13-1: *Emergency Telephone Numbers*. It must be noted that all contact with offsite emergency services will be coordinated through the SSHO.

The information provided to the notified person should include the nature of the incident and the exact location and the suspected contaminants or material involved. Information regarding the incident that should be reported to the emergency operator includes the following:

- Name and telephone number of the individual reporting the incident
- Location and type of incident
- Nature of the incident (fire, explosion, spill, or release) and substances involved
- Number and nature of medical injuries
- Movement or direction of spill/vapor/smoke
- Response actions currently in progress
- Estimate of quantity of any released materials
- Status of incident
- Other pertinent information

Table 13-1: Emergency Telephone Numbers

Service/Contact	Agency/Position	Telephone Number
General Emergency Contact	FWDA	via radio communication
	FWDA Manager	(505) 905-6109
	FWDA BRAC Environmental Coordinator	(330) 358-7312
Land or Air Ambulance	Med Star	911
Emergency Hospital Care	Rehoboth McKinley Christian Hospital	(505) 863-7000 (General) (505) 863-7141 (Em. Room)
Minor Injuries	Rehoboth McKinley Christian Health Care Services	(505) 863-7000 (General)
Police (Local)	McKinley County Sheriff's Office	911 (505) 863-1410 (General) (505) 722-2002 (Dispatch)
	New Mexico State Police	911 (505) 863-9353
Fire	Fort Wingate Fire Department	911 (505) 488-5261
Richard Cruz	FWDA Manager	(505) 905-6109
Mark Patterson	FWDA BRAC Environmental Coordinator	(330) 358-7312
David Henry	PM/COR/Technical Lead	(505) 342-3139
Angela Lane	USACE-Fort Worth District, District Project Chemist	(817) 886-1824
Ken Vernon, PG	Sundance FWDA Program Manager	(505) 835-7660 ext. 157 (Office) (951) 317-5236 (Cell)
John Nance	Sundance-Project Manager and Field Team Leader	(505) 835-7660 ext 152 (Office) (505) 321-7260 (Cell)
Steve Townsend, PG	Sundance-Health and Safety Manager	505.835.7660 (Office) (616) 560-0295 (Cell)

Emergency Recognition and Prevention
Site employees will be informed of all known hazardous substances on site. All site employees will be trained on the potential sources of emergencies for the site, and how to recognize emergency conditions. This training will include recognition of signs of an unplanned release (i.e., odors, visual indications, instrument readings, etc.).

Personal Exposure or Injury
Every precaution will be taken to prevent injuries and/or exposure to chemical hazards (Section 2.2). These precautions generally consist of the following measures:

- Personnel will be properly trained for their work duties
- Site personnel will wear appropriate PPE for each specific task or work assignment
- Site personnel will follow the proper field safety protocols as defined
- Site personnel will be made aware of potential environmental and chemical hazards

In the event of personal exposure to chemical hazards (Section 2.2), the general guidelines presented in this SSHP will be implemented.

13.4 SITE SECURITY AND CONTROL

Site security and control measures are discussed in Section 9.4 Security Procedures.

13.5 FIRE PREVENTION PLAN

Every effort to reduce the potential for wild fires will be observed by the Sundance team, including reducing or eliminating off-road driving and parking in areas with a high probability of inducing a fire (example: dry grasses).

In the event or imminent danger of a fire, all activities will halt, and the SSHO and FWDA Base Realignment and Closure (BRAC) Environmental Coordinator (BEC) will be immediately notified prior to commencing the activity. All activities will halt until the fire danger has passed and work is reauthorized by the SSHO. If it is safe to do so, site personnel may use fire-fighting equipment available onsite to remove and isolate flammable or other hazardous materials that may contribute to the fire.

Small Fires
A small fire is defined as a fire that can be extinguished with a 4A:20B:C fire extinguisher. In the event of a small fire, site personnel will take the following actions:

1. Site personnel will immediately notify the SSHO.
2. The FWDA BEC will be immediately notified of the occurrence of the fire by the SSHO.
3. All unnecessary personnel will be evacuated to an upwind location.
4. Under the initial direction of the SSHO, site personnel will extinguish the fire from an upwind location.
5. The SSHO will summon the local fire department and any other emergency response services (police, ambulance, hospital, etc.) as needed for the treatment of injuries or exposures.

6. Site personnel will not attempt to extinguish a fire, even a small one, if explosives are involved, and all site personnel will evacuate the site if explosives are involved.
7. After the fire is extinguished, an investigation will be initiated to determine the cause of the fire and to identify any operational changes that may be required to prevent future fires.

Large Fires

In the event that a large fire occurs, or if a small fire cannot be extinguished and develops into a large fire, the following actions will be taken:

1. Site personnel will immediately notify the SSHO.
2. The FWDA BEC will be immediately notified of the occurrence of the fire by the SSHO.
3. All unnecessary personnel will be evacuated to an upwind assembly point.
4. The SSHO will summon the local fire department and any other emergency response services (police, ambulance, hospital, etc.) as needed for the treatment of injuries or exposures.
5. To the extent that it can be safely accomplished, the SSHO will direct site personnel to move vital equipment/supplies from the fire's path.
6. To the safest extent possible, and with available resources, site personnel will fight the fire from an upwind location.
7. At no time will attempts be made to extinguish a fire involving explosives and all personnel will evacuate the site if the fire involves explosives.
8. After the fire is extinguished, an investigation will be initiated to determine the cause of the fire and to identify any operational changes that may be required to prevent future fires.
9. Resumption of activities after a large fire requires approval from the FWDA BEC.

13.6 SPILL RESPONSE

If a spill at the site is observed, Sundance will immediately notify the PM and the FWDA BEC. Upon their arrival at the site, the SSHO will brief them on the situation at hand and any potential hazards to the team. An assessment will be made of the magnitude and potential impact of the release. If it is safe to do so, site personnel will attempt to locate the source of the release, prevent further release, and contain the spilled and/or affected materials as follows:

- The spill or release area will be approached cautiously.
- Hazards will be identified based on available information from witnesses or material identification documents (placards, SDSs, logs). The potential hazards will be evaluated to determine the proper personal protection levels, methods, and equipment necessary for response.
- If necessary, the release area will be evacuated, isolated, and secured.

- If possible, spill containment will initially be performed without entering the immediate hazard area.
- Entry to the release area will be made with the PPE, personnel, methods, and equipment necessary to perform the work. Spill containment and collection will be performed in four steps as follows:
  - The spill will be contained with absorbent socks, booms, granules, or construction of temporary dikes.
  - The spill will be contained at the source by plugging leaks, up righting containers, over packing containers, or transferring contents of a leaking container.
  - The spilled material will be collected with shovels or heavy equipment as necessary.
  - The spilled material will be stored for further treatment or disposal. Treatment and/or disposal options of the material will depend on the amount and type of material.

In the unlikely event that site personnel cannot safely and sufficiently respond to a release, evacuation of the area may be warranted. The decision to evacuate will depend upon the severity of the release.

13.7 SPILL CONTAINMENT

No hazardous substances or materials are expected to be on site that would potentially pose a spill concern. Gasoline and diesel fuel may be stored in cans of less than or equal to five gallons. As a precaution, spill containment equipment will be stored in the field equipment office. If a spill occurs, measures to contain the spill will be implemented.

13.8 EVACUATION PROCEDURES AND ROUTES

The PM, OESS, and SSHO have the authority to order personnel to evacuate the area. Each will advise the other as soon as possible if an evacuation order has been issued. Evacuations may or may not be limited to specific EZ or site area. In the event of an emergency or evacuation, all employees will leave the job site immediately upon notification. A safe evacuation distance will depend on the type of emergency and will ultimately be determined by the SSHO.

Site Evacuation Procedures

- Personnel working in the EZ will immediately make their way to the designated assembly or rally point for a "head count." Depending on the severity of the event and allowable time, personnel exiting the EZ may be instructed to forego or modify decontamination procedures.
- Personnel in the EZ will immediately report to the designated assembly or rally point for a "head count" and further instructions. The PM, OESS, and SSHO will remain in contact to ensure that evacuation procedures are properly executed. If the designated assembly or rally point is inaccessible, personnel will evacuate to an upwind location as determined by a windsock, or equivalent, and perform a head count.

- Situations requiring evacuation may include unusually severe weather conditions, fires, or significant chemical spills or releases.
- The safe evacuation distance will depend on the type of emergency involved, such as the presence of MEC and will ultimately be determined by the SSHO, OESS and the PM. If an emergency situation involves chemical warfare material, the default safe distance will be 2,000 feet from the suspected materials.
- In an emergency, it is imperative that site control and security be maintained. To control site personnel, the Site Entry/Exit Log will be used to ensure all personnel are present or accounted for at the assembly point(s).

Site Evacuation Routes and Assembly Points

Prior to the initiation of site operations, the SSHO will identify the evacuation routes and assembly points for the various areas on the site. These routes and assembly points will be identified on the site map and will be communicated each morning to site personnel during the daily safety briefing.

Driving directions from the FWDA to Rehoboth McKinley Christian Hospital are as follows:

- Drive north on Jim Otero Jog toward Jeff King Loop.
- Turn right onto Jeff King Loop.
- Turn left onto NM-400.
- Turn left onto I-40 Frontage Rd West.
- Take exit 26 toward I-40 Business West/I-40 Frontage West.
- Turn left onto NM-564/Boardman Drive.
- Turn right onto College Drive.
- Take the first right onto Hospital Drive.
- Take the first right onto Redrock Drive into Rehoboth McKinley Christian Hospital.

A hospital route map is provided in Figure 13-1: *Hospital Route Map from FWDA to Rehoboth McKinley Christian Hospital.*

Driving directions from the FWDA to University of New Mexico Hospital are as follows:

- Drive north on Jim Otero Jog toward Jeff King Loop.
- Turn right onto Jeff King Loop.
- Turn left onto NM-400.
- Turn right to merge onto I-40 East.
- Take exit 159B to merge onto I-25 South toward Las Cruces.
- Take exit 224B toward Dr. Martin Luther King Jr. Avenue/Central Avenue/Historic U.S. 66.
- Turn left onto Dr. Martin Luther King Jr. Avenue Northeast.
- Turn Left onto University Boulevard NE.
- Turn right onto Lomas Boulevard.
- Continue on Lomas Boulevard to University of New Mexico Hospital, which will be located on the north side of Lomas Boulevard.

A hospital route map is provided in Figure 13-2: *Hospital Route Map from FWDA to University of New Mexico Hospital.*

Emergency Decontamination Procedures

Treatment of illnesses or injuries to personnel working within the areas of the site may be more difficult because of protective clothing requirements and the potential for exposure. The SSHO or Emergency Medical Care Provider must quickly assess the extent of the injury or illness of the victim. A determination will be made if lifesaving medical treatment is critical and if personal decontamination procedures will create additional injuries or aggravate the existing condition. Life-threatening injuries must receive immediate medical attention.

Community Alert Program

It is not anticipated that any onsite operations will result in a potential emergency that would require Sundance to implement a community alert program. However, in the event that an unplanned onsite event affects the local community, the SSHO will notify the FWDA BEC of the potential hazard. The FWDA BEC will then contact local law enforcement for assistance.

LEGEND

- Interstate
- US Highway
- State Road

FWDA = Fort Wingate Depot Activity
US = United States

Source: (c) 2013 Google Earth,
Image Landsat
(c) 2013 INEGI
ESRI ArcMap

NOT TO SCALE

N

Coordinate System:
NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Projection:
Transverse Mercator
Datum:
North American 1983

Date: 10/1/2015

Sundance Consulting Inc.

FIGURE 13-1

Hospital Route Map
from FWDA to
Rehoboth McKinley Christian Hospital

FORT WINGATE DEPOT ACTIVITY
FORT WINGATE, NEW MEXICO

LEGEND

- Interstate
- US Highway
- State Road
- Surface Road

FWDA = Fort Wingate Depot Activity
US = United States

Source: (c) 2013 Google Earth,
Image Landsat
(c) 2013 INEGI
ESRI ArcMap

NOT TO SCALE

N

Coordinate System:
NAD 1983 StatePlane New Mexico West FIPS 3003 Feet
Projection:
Transverse Mercator
Datum:
North American 1983

Date: 10/1/2015

Sundance Consulting Inc.

FIGURE 13-2

Hospital Route Map
from FWDA to
University of New Mexico
Hospital
FORT WINGATE DEPOT ACTIVITY
FORT WINGATE, NEW MEXICO

Post Emergency Follow-Up

Before normal site activities can resume, the site and personnel must be prepared and equipped to handle another emergency. It is also imperative that all U.S. and local regulatory agencies be notified of the emergency. Therefore, the following activities must be conducted prior to restart of site activities:

1. Notify all appropriate governmental agencies, as required (i.e., OSHA must be notified if there have been any fatalities or three or more personnel hospitalized).
2. Restock and clean all equipment and supplies utilized or damaged in the emergency.
3. Items to be cleaned will be only those durable items that can be safely cleaned and reused.
4. The Sundance HSM, in conjunction with the SSHO, will conduct an accident investigation to determine the cause of the emergency and what preventative measures will be taken to ensure the emergency does not occur again.
5. The HSM, in conjunction with the SSHO, will conduct an emergency response critique to assess the effectiveness of the emergency response procedures and to identify any areas requiring improvement.
6. Complete the Sundance and U.S. Army required accident forms.
7. Review and revise, as needed, the site operational and emergency response procedures, and, if necessary, update the SSHP to reflect the new procedures.

14.0 CONFINED SPACE ENTRY

Confined space entry is not anticipated during planned activities. A confined space is defined as a space large enough and so configured that a person can bodily enter and perform assigned work, has limited means for entry or exit, and is not designed for continuous employee occupancy.

15.0 RECORD KEEPING AND DATA MANAGEMENT

Proper record keeping and data management are essential in the implementation of this SSHP. The forms associated with the record keeping and data management requirements must be completed in an accurate, timely fashion and filed with the appropriate entities. It is the responsibility of the SSHO to ensure that the forms are properly completed. Completed forms will be kept and maintained by Sundance. Medical and exposure records will be maintained according to the requirements in 29 CFR 1910.1020. Maintenance of other project records will follow Sundance's Quality Assurance/Quality Control procedures for records retention. Subcontractors will also be responsible for keeping a copy of the forms pertaining to their personnel.

Logs

The SSHO/FTL will maintain and complete a daily log for each day's work in a field notebook. Other relevant data and field information will be recorded as necessary on separate log forms for air monitoring, sampling, equipment calibration inspections, and incident reporting.

Training Log

The SSHO is responsible for ensuring that all safety- and health-related training conducted is documented in a Training Log and/or on the appropriate training forms. This log will include the initial site-specific training conducted prior to the start of site activities, the Daily/Weekly Safety Briefings, hazard-specific training, emergency response exercises, etc. The SSHO will maintain this log and any associated training forms on site.

Visitor Log

The SSHO is responsible for maintaining the visitor log, which will be used to record the entry and exit of all visitors, including Sundance contractor visitors; or Federal, state, or local officials who visit the site. This log will utilize a Site Visitors Log. Information required by the form will be completed by the site visitor and the SSHO. No visitors are allowed to enter the project site or work zones without completing the required information.

Injury/Illness/Accident Reports

In accordance with Engineering Form 3394 USACE Accident Investigation Report, the following categories of accidents/incidents will be reported to the COR by telephone or written report.

- Accidents/Incidents that result in a fatality, injury of employees, lost workdays, and/or property damage assessed at a cost of $10,000 or more. Such incidents will be reported to the COR as soon as possible after learning of the incident. The report will contain as much information as is known concerning the incident. For property damage of $2,000 or more, an Engineering Form 3394 will be completed within 5 calendar days after the incident and forwarded to the COR. The Engineering Form 3394 will be legible and signed by the supervisor of the person injured (or supervisor of the activity where property damage occurred) and by the next level of management. A copy of Engineering Form 3394 is included in Appendix B.
- Any incident that could bring adverse attention or publicity to the USACE.

In the event that a reportable vehicle accident/incident occurs at the job site, the Sundance Auto Accident Form will be completed and forwarded the same day the vehicle accident/incident occurs to the HSM the PM and Sundance President/Vice President. In addition, if Engineering Form 3394 must be completed, the SSHO will complete the form and forward it to the HSM and the PM for review prior to dissemination to USACE.

Accident Reporting Responsibilities

Project personnel are required to report all near misses, injuries, illnesses, and accidents no matter how slight, to their immediate supervisor, who will immediately notify the SSHO. The SSHO will immediately arrange appropriate medical care, as required. Once immediate medical care for the injured personnel has been accomplished, the SSHO will complete and submit a detailed report of the incident within 24 hours to the Sundance President and Vice- President of Operations.

Identified safety and occupational health deficiencies and corrective measures will be documented and filed on site for reference by the Army or designated representative.

Onsite management personnel will investigate reported near misses, injuries, illnesses, and accidents. The PM and/or SSHO will investigate the conditions that led to the accident. They

will document how the accident occurred and identify unsafe acts or conditions that occurred or existed at the time of the accident. Findings will be presented to the HSM. The HSM will determine and implement the corrective actions to prevent recurrence of the accident. The HSM will also assign responsibility for the implementation of corrective actions. The investigation will be started immediately, and all information will be collected as soon as possible after the occurrence. Sundance will submit the final report and required forms to the USACE, the Sundance President and Vice-President of Operations, and other appropriate personnel.

16.0 REFERENCES

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http://www.cdc.gov/hantavirus/surveillance/reporting-state.html, April 21.

Department of Defense Explosives Safety Board (DDSEB), 2004. *Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel*. DDESB Technical Paper 18. Washington, D.C.: U.S. Department of Defense, December 20.

New Mexico Environment Department (NMED), 2005. *Resource Conservation and Recovery Act Permit.* EPA ID Number NM6213820974. New Mexico: New Mexico Environment Department Hazardous Waste Bureau, December. Revised April 2014.

U.S. Army Corps of Engineers (USACE), 2014. *Safety and Health Requirements Manual.* Engineer Manual 385-1-1. Washington, D.C.: U.S. Army Corps of Engineers. November.

USACE, 2004. *Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities.* Engineer Publication 75-1-2. Washington, D.C.: U.S. Army Corps of Engineers.

USACE, 2003. *Safety and Occupational Health Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW).* Engineer Regulation 385-1-92. Washington, D.C.: U.S. Army Corps of Engineers.

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APPENDIX A:
SAFETY DATA SHEETS

AMERADA HESS CORPORATION

MATERIAL SAFETY DATA SHEET

Gasoline, All Grades **MSDS No. 9950**

EMERGENCY OVERVIEW
DANGER!
EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED - ASPIRATION HAZARD

NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION (rev. Jan-04)

Amerada Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs): **CHEMTREC (800)424-9300**
COMPANY CONTACT (business hours): Corporate Safety (732)750-6000
MSDS Internet Website www.hess.com/about/environ.html

SYNONYMS: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS * (rev. Jan-04)

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

3. HAZARDS IDENTIFICATION (rev. Dec-97)

EYES
Moderate irritant. Contact with liquid or vapor may cause irritation.

SKIN
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

CHRONIC EFFECTS and CARCINOGENICITY
Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

4. FIRST AID MEASURES (rev. Dec-97)

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES (rev. Dec-97)

FLAMMABLE PROPERTIES:

FLASH POINT:	-45 °F (-43°C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 °F (>280 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

FIRE AND EXPLOSION HAZARDS

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 “Low Expansion Foam - 1994 Edition.”

FIRE FIGHTING INSTRUCTIONS

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES (rev. Dec-97)

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product

vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE (rev. Dec-97)

HANDLING PRECAUTIONS

******USE ONLY AS A MOTOR FUEL******
******DO NOT SIPHON BY MOUTH******

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

STORAGE PRECAUTIONS

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION (rev. Jan-04)

EXPOSURE LIMITS

Component (CAS No.)	Exposure Limits			
	Source	TWA (ppm)	STEL (ppm)	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3
Benzene (71-43-2)	OSHA	1	5	Carcinogen
	ACGIH	0.5	2.5	A1, skin
	USCG	1	5	
n-Butane (106-97-8)	ACGIH	800	--	2003 NOIC: 1000 ppm (TWA) Aliphatic Hydrocarbon Gases Alkane (C1-C4)
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--	
	ACGIH	1000	--	A4
Ethyl benzene (100-41-4)	OSHA	100	--	
	ACGIH	100	125	A3

Component (CAS No.)	Exposure Limits			
	Source	TWA (ppm)	STEL (ppm)	Note
n-Hexane (110-54-3)	OSHA	500	--	
	ACGIH	50	--	skin
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50		A3
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established
Toluene (108-88-3)	OSHA	200		Ceiling: 300 ppm; Peak: 500 ppm (10 min.)
	ACGIH	50	--	A4 (skin)
1,2,4- Trimethylbenzene (95-63-6)	ACGIH	25	--	
Xylene, mixed isomers (1330-20-7)	OSHA	100	--	
	ACGIH	100	150	A4

ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem ®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL and CHEMICAL PROPERTIES (rev. Jan-04)

APPEARANCE

A translucent, straw-colored or light yellow liquid

ODOR

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

ODOR THRESHOLD

	Odor Detection	Odor Recognition
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H_2O = 1):	0.70 – 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %

SOLUBILITY (H_2O): Non-oxygenated gasoline - negligible (< 0.1% @ 77 ^oF). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 ^oF); ethanol is readily soluble in water

10. STABILITY and REACTIVITY (rev. Dec-94)

STABILITY: Stable. Hazardous polymerization will not occur.

CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

INCOMPATIBLE MATERIALS

Keep away from strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

11. TOXICOLOGICAL PROPERTIES (rev. Dec-97)

ACUTE TOXICITY

Acute Dermal LD50 (rabbits): > 5 ml/kg
Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating
Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative

CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

This product may contain methyl tertiary butyl ether (MTBE): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION (rev. Jan-04)

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS (rev. Dec-97)

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION (rev. Jan-04)

DOT PROPER SHIPPING NAME:	Gasoline
DOT HAZARD CLASS and PACKING GROUP:	3, PG II
DOT IDENTIFICATION NUMBER:	UN 1203
DOT SHIPPING LABEL:	FLAMMABLE LIQUID

PLACARD:

15. REGULATORY INFORMATION (rev. Jan-04)

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) or, if not practical, the U.S. Coast Guard with follow-up to the National Response Center, as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a “petroleum exclusion” clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	--	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION WT. PERCENT
Benzene (71-43-2)	0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline)
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents (www.epa.gov/tri) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

INGREDIENT NAME (CAS NUMBER)	CONCENTRATION - Parts per million (ppm) by weight
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

CANADIAN REGULATORY INFORMATION (WHMIS)

Class B, Division 2 (Flammable Liquid)
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

16. OTHER INFORMATION (rev. Jan-04)

NFPA® HAZARD RATING	HEALTH:	1	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
HMIS® HAZARD RATING	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
	* CHRONIC		

SUPERSEDES MSDS DATED: 12/30/97

ABBREVIATIONS:

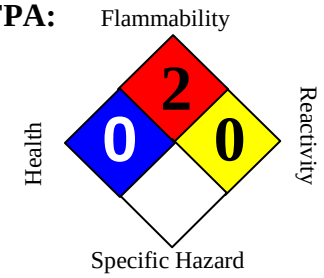
AP = Approximately < = Less than > = Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million

ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
ANSI	American National Standards Institute (212)642-4900
API	American Petroleum Institute (202)682-8000
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
DOT	U.S. Department of Transportation [General Info: (800)467-4922]
EPA	U.S. Environmental Protection Agency
HMIS	Hazardous Materials Information System
IARC	International Agency For Research On Cancer
MSHA	Mine Safety and Health Administration
NFPA	National Fire Protection Association (617)770-3000
NIOSH	National Institute of Occupational Safety and Health
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
NTP	National Toxicology Program
OPA	Oil Pollution Act of 1990
OSHA	U.S. Occupational Safety & Health Administration
PEL	Permissible Exposure Limit (OSHA)
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit (NIOSH)
SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA	Self-Contained Breathing Apparatus
SPCC	Spill Prevention, Control, and Countermeasures
STEL	Short-Term Exposure Limit (generally 15 minutes)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average (8 hr.)
WEEL	Workplace Environmental Exposure Level (AIHA)
WHMIS	Workplace Hazardous Materials Information System (Canada)

Material Safety Data Sheet
Fuel Oil

NFPA:



SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Fuel Oil
Synonyms	:	Bunkers, Black Fuel Oil, MFO, Industrial Fuel Oil, 6 Oil, Slurry Fuel Oil, RFO, Refinery Fuel Oil, High Sulfur Fuel Oil, HSFO, IFO-30, IFO-180, IFO-380, IFO-510, IFO-700, Bunker C, Bunker Fuel Oil, Marine Fuel Oil, Decant Oil, Utility Fuel Oil, LSFO, Six Oil, 888100008793
SDS Number	:	888100008793 **Version** : 1.20
Product Use Description	:	Fuel, Intermediate Stream
Company	:	For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259
Tesoro Call Center	:	(877) 783-7676 **Chemtrec (Emergency Contact)** : (800) 424-9300

SECTION 2. HAZARDS IDENTIFICATION

Classifications

Flammable Liquid – Category 4
Carcinogenicity – Category 1B
Toxic to Reproduction – Category 1B
Specific Target Organ Toxicity (Repeated Exposure) – Category 2
Acute Toxicity – Inhalation – Category 4
Acute Aquatic Toxicity– Category 3

Pictograms

Signal Word

DANGER

Hazard Statements

Combustible liquid.
May cause cancer from prolonged and repeated skin contact.
May damage fertility or the unborn child.
May cause damage to liver, kidney and nervous system through prolonged or repeated exposure.
Harmful if inhaled.
Harmful to aquatic life
Skin and eye irritant.
May contain and release toxic hydrogen sulfide (H2S) gas.

Precautionary Statements

Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from flames and hot surfaces. No smoking. Wear gloves, eye protection and face protection as needed to prevent skin and eye contact with liquid. Wash hands or liquid-contacted skin thoroughly after handling. Do not eat, drink or smoke when using this product. Do not breathe vapors or mists. Use only outdoors or in a well-ventilated area
Response	In case of fire: Use dry chemical, CO2, water spray or fire fighting foam to extinguish. Get medical advice or attention if you feel unwell, are exposed, or become concerned. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If skin or eye irritation persists, get medical attention. If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call or doctor or emergency medical provider
Storage	Store in a well ventilated place. Keep cool. Store locked up. Keep container tightly closed . Use only approved containers.
Disposal	Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	100%
Polycyclic aromatic compounds (PACs or PNAs)		Typically 1.5%
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8	Trace to 0.2%
Hydrogen Sulfide	7783-06-4	Trace to 0.2%
Sulfur (for waters within 25 miles of California shores)	17704-34-9	Trace to 0.1%
Sulfur (for waters within 200 miles of American shores)	17704-34-9	Trace to 1.0%
Sulfur (for International waters)	17704-34-9	Trace to 3.5%

SECTION 4. FIRST AID MEASURES

Inhalation : Move to fresh air. Give oxygen. If breathing is irregular or stopped, administer artificial respiration. Seek medical attention immediately.

Skin contact : Take off all contaminated clothing immediately. Wash off immediately with soap

and plenty of water. Wash contaminated clothing before re-use. If skin irritation persists, call a physician.

Eye contact : Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists, consult a specialist.

Ingestion : Do NOT induce vomiting. Do not give liquids. Seek medical attention immediately. If vomiting does occur naturally, keep head below the hips to reduce the risks of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

Notes to physician : Symptoms: Dizziness, Discomfort, Headache, Nausea, Disorder, Vomiting, Liver disorders, Kidney disorders, Aspiration may cause pulmonary edema and pneumonitis.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Carbon dioxide (CO2), Water spray, Dry chemical, Foam, Keep containers and surroundings cool with water spray.

Specific hazards during fire fighting : Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

Special protective equipment for fire-fighters : Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Further information : Flammable vapor production at ambient temperature in the open is expected to be minimal, as the material is generally wet. However, depending on oil content and conditions, it is possible flammable vapors could accumulate in the headspace of storage containers, presenting a flammability and explosion hazard. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas.

Environmental precautions : Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material.

Methods for cleaning up : Take up with sand or oil absorbing materials. Carefully vacuum, shovel, scoop or sweep up into a waste container for reclamation or disposal.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling : Keep away from fire, sparks and heated surfaces. No smoking near areas where

material is stored or handled. The product should only be stored and handled in areas with intrinsically safe electrical classification.

Hydrocarbon liquids including this product can act as a non-conductive flammable liquid (or static accumulators), and may form ignitable vapor-air mixtures in storage tanks or other containers. Precautions to prevent static-initated fire or explosion during transfer, storage or handling, include but are not limited to these examples:

(1) Ground and bond containers during product transfers. Grounding and bonding may not be adequate protection to prevent ignition or explosion of hydrocarbon liquids and vapors that are static accumulators.
(2) Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such gasoline or naphtha).
(3) Storage tank level floats must be effectively bonded.

For more information on precautions to prevent static-initated fire or explosion, see NFPA 77, Recommended Practice on Static Electricity (2007), and API Recommended Practice 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents (2008).

Conditions for storage, including any incompatabilities : Keep away from flame, sparks, excessive temperatures and open flame. Use approved containers. Keep containers closed and clearly labeled. Empty or partially full product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. The storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Hydrogen sulfide may accumulate in tanks and bulk transport compartments. Consider appropriate respiratory protection (see Section 8). Stand upwind. Avoid vapors when opening hatches and dome covers. Confined spaces should be ventilated and gas tested prior to entry.

Keep away from food, drink and animal feed. Incompatible with oxidizing agents. Incompatible with acids.

No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

List	Components	CAS-No.	Type:	Value
OSHA	Polycyclic aromatic compounds (or coal tar pitch volatiles – benzene soluble)		PEL	0.2 mg/m3
	Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	PEL	5 mg/m3 (as mineral oil mist)
	Hydrogen Sulfide	7783-06-4	STEL	20 ppm
ACGIH	Hydrogen Sulfide	7783-06-4	TWA	1 ppm
		7783-06-4	STEL	5 ppm

	Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	TWA	0.2 mg/m3 (as mineral oil) Sum of 15 NTP-listed polynuclear aromatic hydrocarbons 0.005 mg/m3
	Polycyclic aromatic compounds (or coal tar pitch volatiles – benzene soluble)		TWA	0.2 mg/m3

Engineering measures : Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Eye protection : Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Hand protection : Gloves constructed of nitrile, neoprene, or PVC are recommended.

Skin and body protection : Chemical protective clothing such as DuPont Tyvek QC, TyChem® or equivalent, recommended based on degree of exposure. The resistance of specific material may vary from product to product as well as with degree of exposure.

Respiratory protection : If hydrogen sulfide concentration may exceed permissible exposure limit, a positive-pressure SCBA or Type C supplied air respirator with escape bottle is required as respiratory protection. If hydrogen sulfide concentration is below H2S permissible exposure limit a NIOSH/ MSHA-approved air-purifying respirator with acid gas cartridges may be acceptable for odor control, but continuous air monitoring for H2S is recommended. Protection provided by air-purifying respirators is limited. Use a NIOSH/ MSHA-approved positive-pressure supplied-air respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Work / Hygiene practices : Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Dark green to brown or black liquid

Odor Petroleum asphalt odor

Odor threshold	No data available
pH	Not applicable
Melting point/freezing point	32° - 80°C (89.6° - 176°F)
Initial boiling point & range	154 - 372 °C (310° - 702 °F)
Flash point	60°C (140°F) minimum
Evaporation rate	Higher initially and declining as lighter components evaporate
Flammability (solid, gas)	Flammable vapor released by heated liquid
Upper explosive limit	No data available
Lower explosive limit	No data available
Vapor pressure	210 Pa at 25°C
Vapor density (air = 1)	>5
Relative density (water = 1)	>0.9 to 1.2 g/mL
Solubility (in water)	6 to 1400 mg/L at 25°C
Partition coefficient (n-octanol/water)	3.4 to 5 as log Pow at 25°C
Auto-ignition temperature	>176°C (>350 °F)
Decomposition temperature	Will evaporate or boil and possibly ignite before decomposition occurs.
Kinematic viscosity	>300 cST typical at 40°C

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Vapors may form explosive mixtures with air. Hazardous polymerization does not occur.
Chemical Stability		Stable under normal conditions.
Possibility of hazardous reactions		Can react with strong oxidizing agents and peroxides. Keep away from strong acids and bases.
Conditions to avoid		Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers.
Hazardous decomposition products		Carbon monoxide, carbon dioxide and noncombusted hydrocarbons (smoke).

SECTION 11. TOXICOLOGICAL INFORMATION

Inhalation	:	Because of its low vapor pressure, this product presents a minimal inhalation hazard at ambient temperature. Upon heating, fumes may be evolved. Inhalation of fumes or mist may result in respiratory tract irritation and central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death. The burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death. Irritating and toxic hydrogen sulfide gas may be present. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract

irritation. 50 - 500 ppm can cause headache, nausea, and dizziness. Continued exposure at these levels can lead to loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated. Greater than 1000 ppm can cause immediate unconsciousness and death if not promptly revived. After-effects from overexposure are not anticipated except what would be expected if the victim was without oxygen for more than 3 to 5 minutes (asphyxiation). The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.

Skin irritation

May cause skin irritation with prolonged or repeated contact. Practically non-toxic if absorbed following acute (single) exposure. Exposure may cause a phototoxicity reaction: liquid or mist on the skin may produce a painful sunburn reaction when exposed to sunlight. Product may be hot which could cause 1st, 2nd, or 3rd degree thermal burns.

Eye irritation

May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

Ingestion

This material has a low order of acute toxicity. If large quantities are ingested, nausea, vomiting and diarrhea may result. Ingestion may also cause effects similar to inhalation of the product. Could present an aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe lung damage, respiratory failure and even death.

Further information

This material contains polynuclear aromatic hydrocarbons (PNAs), some of which are animal carcinogens. Studies have shown that similar products produce skin cancer or skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation. The presence of carcinogenic PNAs indicates that precautions should be taken to minimize repeated and prolonged inhalation of fumes or mists. Dermal application of gas oil to rats resulted in limited evidence of liver damage (i.e., increased liver weight and changes in hepatic serum enzyme activity) and bone marrow toxicity (hypoplasia and decreased hemoglobin.) Petroleum industry experience indicates that a program providing for good personal hygiene, proper use of personal protective equipment, and minimizing the repeated and prolonged exposure to liquids and fumes, is effective in reducing or eliminating the carcinogenic risk of high boiling aromatic oils (polynuclear aromatic hydrocarbons) to humans.
Liver and kidney injuries may occur.
Components of the product may affect the nervous system.

Component:

Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	Acute oral toxicity: LD50 rat Dose: 4,320 mg/kg Acute dermal toxicity: LD50 rabbit Dose: 2,001 mg/kg Skin irritation: Classification: Irritating to skin. Result: Mild skin irritation Eye irritation: Classification: Irritating to eyes. Result: Mild eye irritation

Carcinogenicity: Animal experiments showed a statistically significant number of tumors.

Carcinogenicity

NTP	Benzo[a]pyrene; Benzo[def]chrysene (CAS-No.: 50-32-8)
IARC	Benzo[a]pyrene; Benzo[def]chrysene (CAS-No.: 50-32-8)
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
CA Prop 65	WARNING! This product contains a chemical known to the State of California to cause cancer. Benzo[a]pyrene; Benzo[def]chrysene (CAS-No.: 50-32-8)

SECTION 12. ECOLOGICAL INFORMATION

Additional ecological information : Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

SECTION 14. TRANSPORT INFORMATION

CFR

Proper shipping name	:	Not regulated if shipped below 140°F (60°C) Elevated temperature liquid, flammable (if shipped above 140°F (60°C)).
UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	:	9
Packing group	:	III
Hazard inducer	:	(Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil)

TDG

Proper shipping name	:	Not regulated if shipped below 140°F (60°C) Elevated temperature liquid, flammable (if shipped above 140°F (60°C)).
UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	:	9
Packing group	:	III
Hazard inducer	:	(Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil)

IATA Cargo Transport

UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	:	Not regulated if shipped below 140°F (60°c) Not permitted for transport (at 140°F (60°C) or higher temperature) 9

IATA Passenger Transport

UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	:	Not regulated if shipped below 140°F (60°c) Not permitted for transport (at 140°F (60°C) or higher temperature) 9

IMDG-Code

UN-No.	:	Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Description of the goods	:	Elevated temperature liquid, n.o.s. (Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil)
Class	:	Not regulated if shipped below 140°F (60°c) Not permitted for transport (at 140°F (60°C) or higher temperature) 9
Packaging group	:	III
IMDG-Labels	:	9
EmS Number	:	F-A S-P
Marine pollutant	:	No

SECTION 15. REGULATORY INFORMATION

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIROMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil. Fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

TSCA Status	:	On TSCA Inventory
DSL Status	:	All components of this product are on the Canadian DSL list.
SARA 311/312 Hazards	:	Fire Hazard Acute Health Hazard Chronic Health Hazard

SARA III — US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

Components	CAS-No.
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

SARA III — US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR355, Appendix A)

Components	CAS-No.

PENN RTK — US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

Components	CAS-No.
Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

MASS RTK — US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

Components	CAS-No.
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Components	CAS-No.
Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

California Prop. 65 : WARNING! This product contains a chemical known in the State of California to cause cancer.

Benzo[a]pyrene; Benzo[def]chrysene	50-32-8

SECTION 16. OTHER INFORMATION

Further information

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 guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. 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.

Revision Date : 07/26/2012

65, 66, 121, 295, 296, 347, 1003, 1006, 1007, 1009, 1010, 1022, 1054, 1083, 1084, 1085, 1089, 1586, 1886

MATERIAL SAFETY DATA SHEET

LIQUINOX®

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian WorkSafe, Japanese Industrial Standard JIS Z 7250:2000, and European Union REACH Regulations

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	**LIQUINOX®**
CHEMICAL FAMILY NAME:	Detergent.
PRODUCT USE:	Critical-cleaning detergent for laboratory, healthcare and industrial applications
U.N. NUMBER:	Not Applicable
U.N. DANGEROUS GOODS CLASS:	Non-Regulated Material
SUPPLIER/MANUFACTURER'S NAME:	Alconox, Inc.
ADDRESS:	30 Glenn St., Suite 309, White Plains, NY 10603. USA
EMERGENCY PHONE:	**TOLL-FREE in USA/Canada** 800-255-3924
	International calls 813-248-0585
BUSINESS PHONE:	914-948-4040
DATE OF PREPARATION:	May 2011
DATE OF LAST REVISION:	February 2008

SECTION 2 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is a pale yellow liquid no odor. Exposure can be irritating to eyes, respiratory system and skin. It is a non-flammable liquid. The Environmental effects of this product have not been investigated.

US DOT SYMBOLS	CANADA (WHMIS) SYMBOLS	EUROPEAN and (GHS) Hazard Symbols
Non-Regulated	Not Controlled	None

Signal Word: **Caution!**

EU LABELING AND CLASSIFICATION:

Classification of the substance or mixture according to Regulation (EC) No1272/2008 Annex 1
EC# 231-791-2 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 268-356-1 This substance is not classified in the Annex I of Directive 67/548/EEC
CAS# 84133-50-6 Not Listed in EU Chemical Inventory
EC# 232-483-0 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 215-090-9 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 241-543-5 This substance is not classified in the Annex I of Directive 67/548/EEC

GHS Hazard Classification(s):
None

Hazard Statement(s):
None

Precautionary Statement(s):
P264: Wash hands thoroughly after handling
P271: Use only in well ventilated area.

Hazard Symbol(s):
Not Classified

Risk Phrases:
None

Safety Phrases:
S24/25: Avoid contact with skin and eyes

HEALTH HAZARDS OR RISKS FROM EXPOSURE:

ACUTE: Exposure to this product may cause irritation of the eyes, respiratory system and skin. Ingestion may cause gastrointestinal irritation including pain, vomiting or diarrhea.

CHRONIC: This product contains an ingredient which may be corrosive.

TARGET ORGANS: ACUTE: Eye, respiratory System, Skin CHRONIC: None Known

SECTION 3 - COMPOSITION and INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS:	CAS #	EINECS #	ICSC #	WT %	HAZARD CLASSIFICATION; RISK PHRASES
Water	7732-18-5	231-791-2	Not Listed	40 – 60%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium (C10 – C16) Alkylbenzene Sulfonate	68081-81-2	268-356-1	Not Listed	10 – 20%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Alcohol Ethoxylate	84133-50-6	Not Listed	Not Listed	1 – 5%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Coconut Diethanolamide	8051-30-7	232-483-0	Not Listed	1 – 5%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium Xylene Sulfonate	1300-72-7	215-090-9	1514	2 – 7%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Tripotassium EDTA	17572-97-3	241-543-5	Not Listed	1 - 5%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Balance of other ingredients are non-hazardous or less than 1% in concentration (or 0.1% for carcinogens, reproductive toxins, or respiratory sensitizers).					

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard *JIS Z 7250: 2000*.

SECTION 4 - FIRST-AID MEASURES

Contaminated individuals of chemical exposure must be taken for medical attention if any adverse effect occurs. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to health professional with contaminated individual.

EYE CONTACT: If product enters the eyes, open eyes while under gentle running water for at least 15 minutes. Seek medical attention if irritation persists.

SKIN CONTACT: Wash skin thoroughly after handling. Seek medical attention if irritation develops and persists. Remove contaminated clothing. Launder before re-use.

INHALATION: If breathing becomes difficult, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if breathing dificulty continues.

INGESTION: If product is swallowed, call physician or poison control center for most current information. If professional advice is not available, do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow. Seek medical advice. Take a copy of the label and/or MSDS with the victim to the health professional.

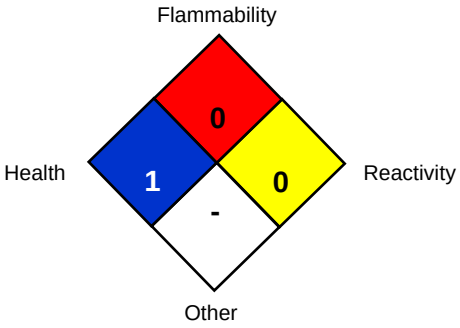
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin, or eye problems may be aggravated by prolonged contact.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce over-exposure.

SECTION 5 - FIRE-FIGHTING MEASURES

FLASH POINT:	Not Flammable
AUTOIGNITION TEMPERATURE:	Not Applicable
FLAMMABLE LIMITS (in air by volume, %):	Lower (LEL): NA Upper (UEL): NA
FIRE EXTINGUISHING MATERIALS:	As appropriate for surrounding fire. Carbon dioxide, foam, dry chemical, halon, or water spray.
UNUSUAL FIRE AND EXPLOSION HAZARDS:	This product is non-flammable, however containers may rupture if exposed to heat or fire.
Explosion Sensitivity to Mechanical Impact:	Not Sensitive.
Explosion Sensitivity to Static Discharge:	Not Sensitive
SPECIAL FIRE-FIGHTING PROCEDURES:	Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Isolate materials not yet involved in the fire and protect personnel. Move containers from fire area if this can be done without risk; otherwise, cool with carefully applied water spray. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

NFPA RATING SYSTEM



HMIS RATING SYSTEM

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD (BLUE)	**1**
FLAMMABILITY HAZARD (RED)	**0**
PHYSICAL HAZARD (YELLOW)	**0**

PROTECTIVE EQUIPMENT

EYES	RESPIRATORY	HANDS	BODY
	See Sect 8		See Sect 8

For Routine Industrial Use and Handling Applications

Hazard Scale: **0** = Minimal **1** = Slight **2** = Moderate **3** = Serious **4** = Severe * = Chronic hazard

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Personnel should be trained for spill response operations.

SPILLS: Contain spill if safe to do so. Prevent entry into drains, sewers, and other waterways. Soak up with an absorbent material and place in an appropriate container for disposal. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations).

SECTION 7 - HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing dusts generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: Containers of this product must be properly labeled. Store containers in a cool, dry location. Keep container tightly closed when not in use. Store away from strong acids or oxidizers.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/GUIDELINES:

Chemical Name	CAS#	ACGIH TWA	OSHA TWA	SWA
Water	7732-18-5	Not Listed	Not Listed	Not Listed
Sodium (C10 – C16) Alkylbenzene Sulfonate	68081-81-2	Not Listed	Not Listed	Not Listed
Alcohol Ethoxylate	84133-50-6	Not Listed	Not Listed	Not Listed
Coconut Diethanolamide	8051-30-7	Not Listed	Not Listed	Not Listed
Sodium Xylene Sulfonate	1300-72-7	Not Listed	Not Listed	Not Listed
Tripotassium EDTA	17572-97-3	Not Listed	Not Listed	Not Listed

Currently, International exposure limits are not established for the components of this product. Please check with competent authority in each country for the most recent limits in place.

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below. Use local exhaust ventilation to control airborne dust. Ensure eyewash/safety shower stations are available near areas where this product is used.

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent standard of Canada, or standards of EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection), and those of Japan. Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below guidelines listed above, if applicable. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EU member states.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: Use chemical resistant gloves to prevent skin contact.. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate to prevent contact (e.g. lab coat, overalls). If necessary, refer to appropriate Standards of Canada, or appropriate Standards of the EU, Australian Standards, or relevant Japanese Standards.

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
APPEARANCE & ODOR:	Pale yellow liquid with no odor.
ODOR THRESHOLD (PPM):	Not Available
VAPOR PRESSURE (mmHg):	17 @ 20°C (68°F)
VAPOR DENSITY (AIR=1):	>1
BY WEIGHT:	Not Available
EVAPORATION RATE (nBuAc = 1):	<1
BOILING POINT (C°):	100°C (212°F)
FREEZING POINT (C°):	Not Available
pH:	8.5
SPECIFIC GRAVITY 20°C: (WATER =1)	1.083
SOLUBILITY IN WATER (%)	Complete
COEFFICIENT OF WATER/OIL DIST.:	Not Available
VOC:	None
CHEMICAL FAMILY:	Detergent

SECTION 10 - STABILITY and REACTIVITY

STABILITY: Product is stable
DECOMPOSITION PRODUCTS: When heated to decomposition this product produces Oxides of carbon (COx), and Hydrocarbons
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids and strong oxidizing agents.
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Contact with incompatible materials.

SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICITY DATA: Toxicity data is not available for mixture:

SUSPECTED CANCER AGENT: None of the ingredients are found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.
IRRITANCY OF PRODUCT: Contact with this product can be irritating to exposed skin, eyes and respiratory system.
SENSITIZATION OF PRODUCT: This product is not considered a sensitizer.
REPRODUCTIVE TOXICITY INFORMATION: No information concerning the effects of this product and its components on the human reproductive system.

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.
ENVIRONMENTAL STABILITY: No Data available at this time.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plants or animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

SECTION 13 - DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations, those of Canada, Australia, EU Member States and Japan.

SECTION 14 - TRANSPORTATION INFORMATION

US DOT; IATA; IMO; ADR:

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.
PROPER SHIPPING NAME: Non-Regulated Material
HAZARD CLASS NUMBER and DESCRIPTION: Not Applicable
UN IDENTIFICATION NUMBER: Not Applicable
PACKING GROUP: Not Applicable.
DOT LABEL(S) REQUIRED: Not Applicable
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): Not Applicable
MARINE POLLUTANT: None of the ingredients are classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B)

U.S. DEPARTMENT OF TRANSPORTATION (DOT) SHIPPING REGULATIONS:
This product is not classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:
This product is not classified as Dangerous Goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA):
This product is not classified as Dangerous Goods, by rules of IATA:

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION:
This product is not classified as Dangerous Goods by the International Maritime Organization.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):
This product is not classified by the United Nations Economic Commission for Europe to be dangerous goods.

SECTION 15 - REGULATORY INFORMATION

UNITED STATES REGULATIONS

SARA REPORTING REQUIREMENTS: This product is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows: None

TSCA: All components in this product are listed on the US Toxic Substances Control Act (TSCA) inventory of chemicals.

SARA 311/312:

Acute Health: Yes Chronic Health: No Fire: No Reactivity: No

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): None

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): None of the ingredients are on the California Proposition 65 lists.

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: All of the components of this product are on the DSL Inventory

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA First Priorities Substance Lists.

CANADIAN WHMIS CLASSIFICATION and SYMBOLS: This product is categorized as a Not Controlled Product, as per the Controlled Product Regulations

EUROPEAN ECONOMIC COMMUNITY INFORMATION:

EU LABELING AND CLASSIFICATION:

Classification of the mixture according to Regulation (EC) No1272/2008. See section 2 for details.

AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: All components of this product are listed on the AICS.

STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Not applicable.

JAPANESE INFORMATION FOR PRODUCT:

JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) STATUS: The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese MITI.

INTERNATIONAL CHEMICAL INVENTORIES:

Listing of the components on individual country Chemical Inventories is as follows:

Asia-Pac:	Listed
Australian Inventory of Chemical Substances (AICS):	Listed
Korean Existing Chemicals List (ECL):	Listed
Japanese Existing National Inventory of Chemical Substances (ENCS):	Listed
Philippines Inventory if Chemicals and Chemical Substances (PICCS):	Listed
Swiss Giftliste List of Toxic Substances:	Listed
U.S. TSCA:	Listed

SECTION 16 - OTHER INFORMATION

PREPARED BY: Paul Eigbrett Global Safety Management, 10006 Cross Creek Blvd. Suite 440, Tampa, FL 33647

Disclaimer: To the best of Alconox, Inc. knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type either express or implied are provided. The information contained herein relates only to this specific product.

ANNEX:

IDENTIFIED USES OF LIQUINOX® AND DIRECTIONS FOR USE

Used to clean: Healthcare instruments, laboratory ware, vacuum equipment, tissue culture ware, personal protective equipment, sampling apparatus, catheters, tubing, disk drives, clean rooms, medical devices, optical parts, electronic components, pharmaceutical apparatus, cosmetics manufacturing equipment, metal castings, forgings and stampings, industrial parts, pipes, tanks and reactors. Authorized by USDA for use in federally inspected meat and poultry plants. Passes inhibitory residue test for water analysis. Used for phosphate sensitive analysis ware. FDAcertified. Used to remove: Soil, grit, grime, slime, grease, oils, blood, tissue, particulates, deposits, chemical and solvents.

Surfaces cleaned: Corrosion inhibited formulation recommended for glass, metal, stainless steel, porcelain, ceramic, plastic, cement and fiberglass. Can be used on soft metals such as copper, aluminum, zinc and magnesium if rinsed promptly. Used for art restoration. Corrosion testing may be advisable.

Cleaning method: Soak, brush, sponge, cloth, ultrasonic, flow through clean-inplace. Will foam—not for spray or machine use.

Directions: Make a fresh 1% solution (2 1/2 Tbsp. per gal., 1 1/4 oz. per gal. or 10 ml per liter) in cold, warm or hot

water. If available, use warm water. Use cold water for blood stains. For difficult soils, raise water temperature and use more detergent. Clean by soak, circulate, wipe or ultrasonic method. Not for spray machines, will foam. RINSE THOROUGHLY—preferably with running water. For critical cleaning, do final or all rinsing in distilled, deionized or purified water. For food contact surfaces, rinse with potable water. Used on a wide range of glass, ceramic, plastic and metal surfaces. Corrosion testing may be advisable.

SAFETY DATA SHEET
Liquid Bleach

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name	Liquid Bleach
Product No.	16003 / 16009

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Washroom Cleaner

1.3. Details of the supplier of the safety data sheet

Supplier	Premiere Products Oakley Gardens, Bouncers Lane, Cheltenham, GLOS GL52 5JD 01242 537103 01242 537177 Fax - 01242 528445 laboratory@premiereproducts.co.uk

1.4. Emergency telephone number

+44 (0)1242 537177 GMT 9am-5pm Monday-Friday

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (1999/45/EEC) R31.

Human health

See section 11 for additional information on health hazards.

Environment

The product is not expected to be hazardous to the environment.

2.2. Label elements

Risk Phrases

R31	Contact with acids liberates toxic gas.

Safety Phrases

S1/2	Keep locked up and out of the reach of children.
S24/25	Avoid contact with skin and eyes.
S46	If swallowed, seek medical advice immediately and show this container or label.
S50	Do not mix with acid.

2.3. Other hazards

This product does not contain any PBT or vPvB substances.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

SODIUM HYPOCHLORITE SOLUTION, ... % Cl ACTIVE	1-5%
CAS-No.: 7681-52-9 EC No.: 231-668-3	

Classification (EC 1272/2008)	Classification (67/548/EEC)
EUH031	C;R34
Skin Corr. 1B - H314	R31
Aquatic Acute 1 - H400	N;R50

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Remove victim immediately from source of exposure. Move the exposed person to fresh air at once. Get medical attention.

Ingestion

Rinse mouth thoroughly with water and give large amounts of milk or water to people not unconscious. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs. Get medical attention immediately!

Skin contact

Promptly wash contaminated skin with water. Promptly remove clothing if soaked through and wash the skin with water. Get medical attention if any discomfort continues.

Eye contact

Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation

Irritation of nose, throat and airway.

Ingestion

May cause stomach pain or vomiting.

Skin contact

Reddened skin if chemical is not removed by washing. Later, white and wrinkled skin without pain, often with delayed skin burns.

Eye contact

May cause blurred vision and serious eye damage.

4.3. Indication of any immediate medical attention and special treatment needed

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Water. Foam. Carbon dioxide (CO_2). Dry chemicals, sand, dolomite etc.

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

None under normal conditions.

Unusual Fire & Explosion Hazards

No unusual fire or explosion hazards noted.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Use supplied air respirator if product is involved in a fire.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Do not discharge into drains, water courses or onto the ground. Collect and dispose of spillage as indicated in section 13.

6.3. Methods and material for containment and cleaning up

Absorb with inert, damp, non-combustible material, then flush area with water.

6.4. Reference to other sections

For personal protection, see section 8.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Read and follow manufacturer's recommendations.

7.2. Conditions for safe storage, including any incompatibilities

Store at moderate temperatures in dry, well ventilated area.
Storage Class
Chemical storage.

7.3. Specific end use(s)

The identified uses for this product are detailed in Section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Ingredient Comments
WEL = Workplace Exposure Limits

8.2. Exposure controls

Protective equipment

Respiratory equipment
No specific recommendation made, but respiratory protection may still be required under exceptional circumstances when excessive air contamination exists.
Hand protection
Use protective gloves.
Eye protection
Wear approved safety goggles.
Other Protection
Wear appropriate clothing to prevent any possibility of skin contact.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Liquid
Colour	Water-white.
Odour	Chlorine.
Solubility	Soluble in water.

Initial boiling point and boiling range (°C)
Not determined.
Melting point (°C)
Not determined.

Relative density	1.06 @20

Bulk Density
Not determined.

Vapour density (air=1)
Not determined.
Vapour pressure
Not determined.
Evaporation rate
Not determined.
Evaporation Factor
Not determined.
pH-Value, Conc. Solution 12.0
pH-Value, Diluted Solution
Not determined.
Viscosity
Not determined.
Solubility Value (G/100G H2O@20°C)
Not determined.
Decomposition temperature (°C)
Not determined.
Odour Threshold, Lower
Not determined.
Odour Threshold, Upper
Not determined.
Flash point (°C)
Not determined.
Auto Ignition Temperature (°C)
Not determined.
Flammability Limit - Lower(%)
Not determined.
Flammability Limit - Upper(%)
Not determined.
Partition Coefficient
(N-Octanol/Water)
Not determined.
Explosive properties
Not determined.
Other Flammability
Not determined.
Oxidising properties
Not determined.

9.2. Other information

Not known.
Volatile By Vol. (%) Actives 4.5 Av Cl2

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Generates toxic gas in contact with acid.

10.2. Chemical stability

Avoid Contact with acids.

10.3. Possibility of hazardous reactions

Not known.

10.4. Conditions to avoid

Generates toxic gas in contact with acid.

10.5. Incompatible materials

Materials To Avoid
Strong acids.

10.6. Hazardous decomposition products

None under normal conditions.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity:
Acute Toxicity (Oral LD50)
Not determined.
Acute Toxicity (Dermal LD50)
Not determined.
Acute Toxicity (Inhalation LC50)
Not determined.

Respiratory or skin sensitisation:
Respiratory sensitisation
Not determined.
Skin sensitisation
Not determined.

Germ cell mutagenicity:
Genotoxicity - In Vitro
Not determined.
Genotoxicity - In Vivo
Not determined.

Carcinogenicity:
Carcinogenicity
Not determined.

Reproductive Toxicity:
Reproductive Toxicity - Fertility
Not determined.
Reproductive Toxicity - Development
Not determined.

Specific target organ toxicity - single exposure:
STOT - Single exposure
Not determined.

Specific target organ toxicity - repeated exposure:
STOT - Repeated exposure
Not determined.

Aspiration hazard:

Viscosity
Not determined.

Inhalation
Vapour may irritate respiratory system or lungs.

Ingestion
Irritating. May cause nausea, stomach pain and vomiting.

Skin contact
Prolonged and frequent contact may cause redness and irritation.

Eye contact
May cause severe irritation to eyes.
Target Organs
No specific target organs noted

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Not regarded as dangerous for the environment.

12.1. Toxicity

Acute Fish Toxicity

Not considered toxic to fish.

12.2. Persistence and degradability

Degradability

The product is biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential

No data available on bioaccumulation.

Partition coefficient

Not determined.

12.4. Mobility in soil

Mobility:

The product is soluble in water.

12.5. Results of PBT and vPvB assessment

This product does not contain any PBT or vPvB substances.

12.6. Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

General information

Waste to be treated as controlled waste. Disposal to licensed waste disposal site in accordance with local Waste Disposal Authority.

13.1. Waste treatment methods

Dispose of waste and residues in accordance with local authority requirements.

SECTION 14: TRANSPORT INFORMATION

General	The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

No information required.

14.2. UN proper shipping name

No information required.

14.3. Transport hazard class(es)

No information required.

14.4. Packing group

No information required.

14.5. Environmental hazards

Environmentally Hazardous Substance/Marine Pollutant

No.

14.6. Special precautions for user

Not known.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Uk Regulatory References

The Control of Substances Hazardous to Health Regulations 2002 (S.I 2002 No. 2677) with amendments.

EU Legislation

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, including amendments.

15.2. Chemical Safety Assessment

No chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

Issued By	Health & Safety Officer
Revision Date	17/06/2013
Revision	2
Supersedes date	05/02/2010
SDS No.	4
Date	17/6/2013
Risk Phrases In Full	
R34	Causes burns.
R31	Contact with acids liberates toxic gas.
R50	Very toxic to aquatic organisms.
Hazard Statements In Full	
H314	Causes severe skin burns and eye damage.
EUH031	Contact with acids liberates toxic gas.
H400	Very toxic to aquatic life.

Section 1 - Identification of Chemical Product and Company

Australian Scientific Pty Ltd
11 McDougall St
Kotara NSW 2289
Tel: 1800 02 1083 (office hours)

Substance:	Water solution of Potassium hydrogen phthalate.
Trade Name:	**Auto Calibration Solution for HORIBA U-50/U-10 Series**
Other Names:	Horiba Auto cal soln, Horiba pH4 buffer solution**, 100-4, 140-4**
Product Use:	Standard reagent for calibrating laboratory test instruments and water quality meters.
Creation Date:	**October, 2007**
Revision Date:	**October, 2013**

Section 2 - Hazards Identification

Statement of Hazardous Nature

This product is classified as: Not classified as hazardous according to the criteria of ASCC.

Not a Dangerous Good according to the Australian Dangerous Goods (ADG) Code.

Risk Phrases: Not Hazardous - No criteria found.
Safety Phrases: S25. Avoid contact with eyes.
SUSDP Classification: None allocated.
ADG Classification: None allocated. Not a Dangerous Good under the ADG Code.
UN Number: None allocated

Emergency Overview

Physical Description & Colour: Clear, colourless liquid.
Odour: No odour.
Major Health Hazards: no significant risk factors have been found for this product.

Potential Health Effects

Inhalation:

Short Term Exposure: Available data indicates that this product is not harmful. In addition product is unlikely to cause any discomfort or irritation.
Long Term Exposure: No data for health effects associated with long term inhalation.

Skin Contact:

Short Term Exposure: Available data indicates that this product is not harmful. It should present no hazards in normal use. In addition product is unlikely to cause any discomfort in normal use.
Long Term Exposure: No data for health effects associated with long term skin exposure.

Eye Contact:

Short Term Exposure: This product may be mildly irritating to eyes, but is unlikely to cause anything more than mild discomfort which should disappear once product is removed.
Long Term Exposure: No data for health effects associated with long term eye exposure.

Ingestion:

Short Term Exposure: Significant oral exposure is considered to be unlikely. However, this product may be mildly irritating to mucous membranes but is unlikely to cause anything more than mild transient discomfort.
Long Term Exposure: No data for health effects associated with long term ingestion.

Carcinogen Status:

ASCC: No significant ingredient is classified as carcinogenic by ASCC.
NTP: No significant ingredient is classified as carcinogenic by NTP.
IARC: No significant ingredient is classified as carcinogenic by IARC.

Section 3 - Composition/Information on Ingredients

Ingredients	CAS No	Conc,%	TWA (mg/m^3)	STEL (mg/m^3)
Potassium hydrogen phthalate	877-24-7	1	not set	not set
Water	7732-18-5	to 100	not set	not set

This is a commercial product whose exact ratio of components may vary slightly. Minor quantities of other non hazardous ingredients are also possible.

The ASCC TWA exposure value is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. The STEL (Short Term Exposure Limit) is an exposure value that may be equalled (but should not be exceeded) for no longer than 15 minutes and should not be repeated more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. The term "peak "is used when the TWA limit, because of the rapid action of the substance, should never be exceeded, even briefly.

Section 4 - First Aid Measures

General Information:

You should call The Poisons Information Centre if you feel that you may have been poisoned, burned or irritated by this product. The number is 13 1126 from anywhere in Australia (0800 764 766 in New Zealand) and is available at all times. Have this MSDS with you when you call.

Inhalation: First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.
Skin Contact: Irritation is unlikely. However, if irritation does occur, flush with lukewarm, gently flowing water for 5 minutes or until chemical is removed.
Eye Contact: No effects expected. If irritation does occur, flush contaminated eye(s) with lukewarm, gently flowing water for 5 minutes or until the product is removed. Obtain medical advice if irritation becomes painful or lasts more than a few minutes. Take special care if exposed person is wearing contact lenses.
Ingestion: If product is swallowed or gets in mouth, do NOT induce vomiting; wash mouth with water and give some water to drink. If symptoms develop, or if in doubt contact a Poisons Information Centre or a doctor.

Section 5 - Fire Fighting Measures

Fire and Explosion Hazards: There is no risk of an explosion from this product under normal circumstances if it is involved in a fire.
Only small quantities of decomposition products are expected from this products at temperatures normally achieved in a fire. This will only occur after heating to dryness.
Fire decomposition products from this product are not expected to be hazardous or harmful.
Extinguishing Media: Not Combustible. Use extinguishing media suited to burning materials.
Fire Fighting: If a significant quantity of this product is involved in a fire, call the fire brigade.

Flash point:	Does not burn.
Upper Flammability Limit:	Does not burn.
Lower Flammability Limit:	Does not burn.
Autoignition temperature:	Not applicable - does not burn.
Flammability Class:	Does not burn.

Section 6 - Accidental Release Measures

Accidental release: Minor spills do not normally need any special cleanup measures. In the event of a major spill, prevent spillage from entering drains or water courses. As a minimum, wear overalls, goggles and gloves. Suitable materials for protective clothing include rubber, PVC.
Stop leak if safe to do so, and contain spill. Absorb onto sand, vermiculite or other suitable absorbent material. Sweep up and shovel or collect recoverable product into labelled containers for recycling or salvage, and dispose of promptly. Thoroughly launder protective clothing before storage or re-use. Advise laundry of nature of contamination when sending contaminated clothing to laundry.

Section 7 - Handling and Storage

Handling: Keep exposure to this product to a minimum, and minimise the quantities kept in work areas. Check Section 8 of this MSDS for details of personal protective measures, and make sure that those measures are followed. The measures detailed below under "Storage" should be followed during handling in order to minimise risks to persons using the product in the workplace. Also, avoid contact or contamination of product with incompatible materials listed in Section 10.
Storage: Make sure that the product does not come into contact with substances listed under "Incompatibilities" in Section 10. Some liquid preparations settle or separate on standing and may require stirring before use. Check packaging - there may be further storage instructions on the label.

Section 8 - Exposure Controls and Personal Protection

The following Australian Standards will provide general advice regarding safety clothing and equipment:

Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Industrial Clothing: **AS2919**, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

ASCC Exposure Limits **TWA (mg/m^3)** **STEL (mg/m^3)**

Exposure limits have not been established by ASCC for any of the significant ingredients in this product.

No special equipment is usually needed when occasionally handling small quantities. The following instructions are for bulk handling or where regular exposure in an occupational setting occurs without proper containment systems.

Ventilation: No special ventilation requirements are normally necessary for this product. However make sure that the work environment remains clean and that vapours and mists are minimised.

Eye Protection: Eye protection is not normally necessary when this product is being used. However, if in doubt, wear suitable protective glasses or goggles.

Skin Protection: The information at hand indicates that this product is not harmful and that normally no special skin protection is necessary. However, we suggest that you routinely avoid contact with all chemical products and that you wear suitable gloves (preferably elbow-length) when skin contact is likely.

Protective Material Types: There is no specific recommendation for any particular protective material type.

Respirator: Usually, no respirator is necessary when using this product. However, if you have any doubts consult the Australian Standard mentioned above.

Section 9 - Physical and Chemical Properties:

Physical Description & colour:	Clear, colourless liquid.
Odour:	No odour.
Boiling Point:	Approximately 100°C at 100kPa.
Freezing/Melting Point:	Approximately 0°C.
Volatiles:	Water component.
Vapour Pressure:	2.37 kPa at 20°C (water vapour pressure).
Vapour Density:	No data.
Specific Gravity:	Approx 1.00
Water Solubility:	Completely soluble in water.
pH:	4.00
Volatility:	No data.
Odour Threshold:	No data.
Evaporation Rate:	No data.
Coeff Oil/water Distribution:	No data
Autoignition temp:	Not applicable - does not burn.

Section 10 - Stability and Reactivity

Reactivity: This product is unlikely to react or decompose under normal storage conditions. However, if you have any doubts, contact the supplier for advice on shelf life properties.

Conditions to Avoid: None known.

Incompatibilities: acids, bases.

Fire Decomposition: Only small quantities of decomposition products are expected from this products at temperatures normally achieved in a fire. This will only occur after heating to dryness. Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Water, potassium compounds. Carbon monoxide poisoning produces headache, weakness, nausea, dizziness, confusion, dimness of vision, disturbance of judgment, and unconsciousness followed by coma and death.

Polymerisation: This product will not undergo polymerisation reactions.

Section 11 - Toxicological Information

Local Effects:

Target Organs: There is no data to hand indicating any particular target organs.

Classification of Hazardous Ingredients

Ingredient Risk Phrases

No ingredient mentioned in the HSIS Database is present in this product at hazardous concentrations.

Section 12 - Ecological Information

This product is biodegradable. It will not accumulate in the soil or water or cause long term problems.

Section 13 - Disposal Considerations

Disposal: There are many pieces of legislation covering waste disposal and they differ in each state and territory, so each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. The Hierarchy of Controls seems to be common - the user should investigate: Reduce, Reuse, and Recycle and only if all else fails should disposal be considered. Note that properties of a product may change in use, so that the following suggestions may not always be appropriate. The following may help you in properly addressing this matter for this product. This product may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to separate the contamination in some way. Only if neither of these options is suitable, consider landfill.

Section 14 - Transport Information

ADG Code: This product is not classified as a Dangerous Good. No special transport conditions are necessary unless required by other regulations.

Section 15 - Regulatory Information

AICS: All of the significant ingredients in this formulation are compliant with NICNAS regulations.

Section 16 - Other Information

This MSDS contains only safety-related information. For other data see product literature.

Acronyms:

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail
AICS	Australian Inventory of Chemical Substances
ASCC	Office of the Australian Safety and Compensation Council
CAS Number	Chemical Abstracts Service Registry Number
Hazchem Code	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
IARC	International Agency for Research on Cancer
NOS	Not otherwise specified
NTP	National Toxicology Program (USA)
R-Phrase	Risk Phrase
SUSDP	Standard for the Uniform Scheduling of Drugs & Poisons
UN Number	United Nations Number

THIS MSDS SUMMARISES OUR BEST KNOWLEDGE OF THE HEALTH AND SAFETY HAZARD INFORMATION OF THE PRODUCT AND HOW TO SAFELY HANDLE AND USE THE PRODUCT IN THE WORKPLACE. EACH USER MUST REVIEW THIS MSDS IN THE CONTEXT OF HOW THE PRODUCT WILL BE HANDLED AND USED IN THE WORKPLACE.

IF CLARIFICATION OR FURTHER INFORMATION IS NEEDED TO ENSURE THAT AN APPROPRIATE RISK ASSESSMENT CAN BE MADE, THE USER SHOULD CONTACT THIS COMPANY SO WE CAN ATTEMPT TO OBTAIN ADDITIONAL INFORMATION FROM OUR SUPPLIERS

OUR RESPONSIBILITY FOR PRODUCTS SOLD IS SUBJECT TO OUR STANDARD TERMS AND CONDITIONS, A COPY OF WHICH IS SENT TO OUR CUSTOMERS AND IS ALSO AVAILABLE ON REQUEST.

Please read all labels carefully before using product.

This MSDS is prepared in accord with the ASCC document “National Code of Practice for the Preparation of Material Safety Data Sheets” 2nd Edition [NOHSC:2011(2003)]

AZER SCIENTIFIC

SDS Safety Data Sheet – Deionized Water

05/2015

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Deionized Water
SYNONYMS: Reagent Water, Purified Water, Distilled Water
PRODUCT CODES: ES616, ES616-32, ES616-2.5G, ES616-5G, ES611, ES612

MANUFACTURER: Azer Scientific, Inc.
ADDRESS: 701 Hemlock Rd, Morgantown, PA 19543

CHEMTREC PHONE: 800-424-9300
SUPPORT: 610-524-5810
FAX: 610-901-3046

PRODUCT USE: Laboratory grade water
PREPARED BY: CB

SECTION 1 NOTES:

SECTION 2: HAZARDS IDENTIFICATION

GHS CLASSIFICATION: The substance is not classified according to the Globally Harmonized System (GHS).

Pictogram: N/A
Signal Word: N/A

SECTION 2 NOTES:

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT:	CAS NO.	% WT
Water	7732-18-5	100

SECTION 3 NOTES:

SECTION 4: FIRST AID MEASURES

EYES: Generally not expected to irritate eyes.
SKIN: Generally product will not irritate skin.
INGESTION: Generally not harmful if ingested.
INHALATION: Supply fresh air. Consult physician if irritation occurs.

SECTION 4 NOTES:

SECTION 5: FIRE-FIGHTING MEASURES

FLAMMABILITY OF THE PRODUCT: Will not burn, will not support fire.

FLASH POINT: Not available

AUTOIGNITION TEMPERATURE: Not available

NFPA HAZARD CLASSIFICATION
HEALTH:0 FLAMMABILITY: 0 REACTIVITY: 0
OTHER:

HMIS HAZARD CLASSIFICATION
HEALTH:0 FLAMMABILITY: 0 REACTIVITY: 0
PROTECTION:

EXTINGUISHING MEDIA: Use extinquishing media suitable for surrounding fire.

NOT SUITABLE: No information available.

SPECIAL FIRE FIGHTING PROCEDURES: N/A

HAZARDOUS DECOMPOSITION PRODUCTS: N/A

SECTION 5 NOTES:

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES: Absorb with an inert dry material and place in an appropriate waste disposal container.

SECTION 6 NOTES:

SECTION 7: HANDLING AND STORAGE

HANDLING: No special handling required.

STORAGE: No special storage requirements.

SECTION 7 NOTES:

SECTION 8: EXPOSURE CONTROL/PERSONAL PROTECTION

ENGINEERING CONTROLS: Handle in accordance with good industrial hygiene and safety practice.

RESPIRATORY PROTECTION: No special equipment required.

EYE PROTECTION: Glasses or splash goggles recommended in accordance with good industrial hygiene and safety practice.

SKIN PROTECTION: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: N/A

WORK HYGIENIC PRACTICES: N/A

EXPOSURE GUIDELINES: N/A

Component	Source	Type	Value	Note

SECTION 8 NOTES:

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear, colorless
ODOR: Odorless
PHYSICAL STATE: Liquid
pH AS SUPPLIED: Not Available
BOILING POINT: 100°C
MELTING POINT/FREEZING POINT: 0°C
VAPOR PRESSURE (mmHg): 3.169 kPa @ 25 °C
VAPOR DENSITY (AIR = 1): Not Available
EVAPORATION RATE: Not Available
SOLUBILITY IN WATER: Soluble in water
MOLECULAR WEIGHT: 16
VISCOSITY: Not established

SECTION 9 NOTES:

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Product is stable under normal conditions of use.

CONDITIONS TO AVOID (STABILITY): None known.

INCOMPATIBILITY (MATERIAL TO AVOID): Strong acids and bases, water reactive substances.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: None known.

HAZARDOUS POLYMERIZATION: No hazardous polymerization

CONDITIONS TO AVOID (POLYMERIZATION): N/A

SECTION 10 NOTES:

SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
no data available
Inhalation LC50
no data available
Dermal LD50
no data available
Other information on acute toxicity
no data available
Skin corrosion/irritation
no data available
Serious eye damage/eye irritation
Eyes: no data available
Respiratory or skin sensitization
no data available
Germ cell mutagenicity
no data available
Carcinogenicity:
NTP: No **IARC**: No **OSHA Reg**: No
Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available
Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available
Aspiration hazard
no data available
Potential health effects: None known

Signs and Symptoms of Exposure: N/A

ROUTES OF ENTRY: Skin/eye contact, inhalation, and ingestion.

ACUTE HEALTH HAZARDS: None known

TARGET ORGANS: N/A

SECTION 11 NOTES:

SECTION 12: ECOLOGICAL INFORMATION

TOXICITY: No relevant information available.
PERSISTANCE AND DEGRADABILITY: Expected to readily degrade.
BIOACCUMULATIVE POTENTIAL: N/A
MOBILITY IN SOIL: N/A
PBT and vPvB ASSESSMENT: Not Required

SECTION 12 NOTES:

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Spent product or spill clean up-follow all provincial, local, state, and federal regulations.

RCRA HAZARD CLASS:

SECTION 13 NOTES:

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION: Not Regulated
PROPER SHIPPING NAME:
HAZARD CLASS:
ID NUMBER:
PACKING GROUP:
LABEL STATEMENT:
ENVIRONMENTAL HAZARDS:

AIR TRANSPORTATION: Not Regulated
PROPER SHIPPING NAME:
HAZARD CLASS:
ID NUMBER:
PACKING GROUP:
LABEL STATEMENTS:

OTHER AGENCIES:
Canadian TDG: Not regulated / **Environmental Hazards:** No
EU ADR/RID: Not regulated / **Environmental Hazards:** No
IATA/ICAO: Not regulated / **Environmental Hazards:** No

SECTION 14 NOTES:

SECTION 15: REGULATORY INFORMATION

United States
HCS Classification: Not Classified

U.S. Federal regulations:

TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory.
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals:
SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT):

DEA List I & II Chemicals
(Precursor Chemicals): Not listed

RTK STATES: Water CAS# 7732-18-5 **PA, NJ**

California Prop. 65
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm: None

CANADA
WHMIS (Canada): Not Classified

CEPA DSL / CEPA NDSL: All components are listed or exempted.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations
International lists:

Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

SECTION 16: OTHER INFORMATION

DISCLAIMER: This Safety Data Sheet has been prepared in accordance with the Globally Harmonized System for the Classification and Labelling of Chemicals (GHS). To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries makes any warranty of merchantability or any other warranty, expressed or implied, which respect to such information, and we assume no liability resulting from its use. In no event shall Azer Scientific be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages resulting from use of or reliance upon this information.

PREPARATION INFORMATION: Prepared 5/28/2015 REV1

ATTACHMENT 2:
ACCIDENT PREVENTION PLAN FIELD FORMS

Sundance Consulting, Inc.

Tailgate Safety Meeting
&
Job Safety Analysis

Project Name _____ PM: _____

Location: _____ SSHO: _____

Project Number _____ SUXOS: _____
(OPTIONAL)

Weather: _____ Date: _____ Time: _____

Activities to be performed: _____

Hazards Related to Task(s): _____

Equipment Used _____

Additional Safety Topics or Discussions: _____

SIGNATURES

Print	Organization	Sign

Sundance Consulting, Inc.

SITE ACCESS AND VISITOR LOG

Site Name: ______________________ **PM:** ______________________

Contract/ Task Order: ______________________ **SSHO:** ______________________

Date	Name	Organization	Time	
			In	Out

Sundance Consulting, Inc.

SAFETY TRAINING ATTENDANCE LOG

Site Name: _____ **PM:** _____

Location: _____ **SSHO:** _____

Contract/
Task Order: _____ **SUXOS:** _____
(OPTIONAL)

Date: _____ **Instructor:** _____ **Time:** _____

Training Provided: _____
(DESCRIBE)

Name	Signature	Organization

Sundance Consulting, Inc.

3-Day Onsite Supervised Training
&
HazCom Log

Site Name:

PM:

Location:

SSHO:

Contract/ Task Order:

SUXOS:
(OPTIONAL)

The site personnel listed beow have received Site Hazard Communication (HAZCOM) as specified in 20 CFR 1910.120(i) and have participated in three-days of supervies on-site training as required by 29 CFR 1910.120€(i). The Site Hazard Information Taining include infroamtion related to the nature, level, and degree of exposure likely to result during participation in site opeations . The 3-Day Training has inculded: a description of the site chain-of-command; use/care/maintenance of PPE; personnel and equipment decon procedures; safe work paractices; medical/training requrements; and emergency response procedures.

Name (printed)	Signature	3-Day Supervision	HazCom	Date Started	Date Completed
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Sundance Consulting, Inc.

AUTO ACCIDENT FORM

Driver's Name: _____ **DOB:** _____
Last Name, First Name MI

SSN: _____ **Driver's License No.** _____ **State:** _____

Your Department: _____ **Address:** _____

Telephone Number, where you may be reached: Office _____ **Home :** _____

Rental Vehicle: ☐ **Yes** ☐ **No** **If, yes, Rental Agency:** _____

Vehicle Identification Number: _____ **Lic Plate Number:** _____

Year: _____ **Make:** _____ **Model:** _____

Description of Injuries, if any: _____

Damages to Your Vehicle: _____

Were Police/DPS Notified ☐ **Yes** ☐ **No** **Were Pictures Taken:** ☐ **Yes** ☐ **No**

If yes, Officer's Name: _____ **Report or File Number:** _____

Date of Accident: _____ **LOCATION OF ACCIDENT:** _____

_____

OTHER PERSON(S) INVOLVED

Name: _____ **DOB:** _____

Address: _____ **Driver's License Number:** _____

How may we contact you: Work: _____ **Home** _____ **Other:** _____

VEHICLE INVOLVED

Vehicle Identification Number: _____ **Lic Plate Number:** _____

Year: _____ **Make:** _____ **Model:** _____

Insurance Carrier: _____ **Policy Number:** _____

Description of Injuries, if any: _____

Damages to Your Vehicle: _____

_____

NARRATIVE REPORT/SUMMARY OF ACCIDENT: