



# HEALTH AND SAFETY PLAN FOR REMEDIAL ACTION IMPLEMENTATION

USS Lead Operable Unity Zone 1 Property | East Chicago, Indiana

**March 2023**

**Prepared for:**

Industrial Development Advantage of  
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## Notice to Health and Safety Plan User

This document is required by **Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120**. This document defines the Health and Safety considerations for on-site activities by Verdantas employees and its subcontractors. The basic requirements for the health and safety of the project workers are delineated in the standard Health and Safety policies and procedures. All on-site personnel will be informed about the pertinent sections of this Health and Safety Plan (HASP) that apply to their activities and potential hazard exposures. If additional activities that are not outlined in this HASP are to be conducted, this document shall be amended as necessary to include the tasks, hazards, and appropriate hazard mitigation procedures for those activities.

Verdantas LLC (Verdantas) intends for this Health and Safety Plan (HASP) to provide a general overview of basic health and safety hazards and controls that are routinely encountered and implemented at a typical site involving excavation, handling, and hauling material potentially containing hazardous contamination. These guidelines are not intended to address all types of hazards that may arise, and they do not include controls and response guidelines in sufficient detail to handle all emergencies or other unanticipated site conditions. All questions and clarifications regarding the material in this HASP, in addition to questions pertaining to health and safety issues not covered in this HASP, should be directed immediately to the Project Manager/Project Coordinator (PC) and/or Health & Safety Officer (HSO).

This HASP is prepared for Verdantas employees, subcontractors, and visitors. This plan will be reviewed and acknowledged by Verdantas' staff and will be provided to subcontractors and visitors at the Property. However, each employer has the ultimate responsibility for providing a safe and healthy work environment for its employees, including all pertinent safety training and certification requirements before beginning work at the Property.



## 1.0 Project Description

The Property consists of the 52.726-acre portion of Operable Unit 1 ("OU-1"), modified Zone 1 of the USS Lead Superfund Site purchased by the Industrial Development Advantage of East Chicago, LLC "Purchaser" ("Property") as shown on **Figure 1**. The Property is shown on Figure 2 and the remediation areas are shown on **Figure 3**. The term Site as used in this document is referring to the Property purchased by the Purchaser. On February 24, 2020, IDA entered into an agreement with the City of East Chicago to purchase and redevelop the Property ("Redevelopment Agreement"). The Redevelopment Agreement contemplated the remediation of the Property and redevelopment by construction of a commercial use facility.

In April 2009, the US EPA placed the Property on the National Priorities List ("NPL") to prioritize the investigation and remediation of the Site under the Comprehensive Environmental Response Compensation and Liability Act ("CERCLA"). On October 28, 2014, the US District Court for the Northern District of Indiana entered a Consent Decree ("CD") regarding the remediation of the Site. The CD required the Chemours Company FC, LLC ("Chemours") company, Atlantic Richfield Company ("ARC"), and E.I. Du Pont de Nemours and Company ("DuPont") collectively the "CD Respondents" to work with US EPA to fund the excavation and removal of contaminated soil from what were defined in the CD as Zones 1 and 3 and to transport and dispose of the contaminated soil.

Almost all of Zone 1 is included in the Property which includes parcels currently owned by the East Chicago Housing Authority ("ECHA") and the City of East Chicago ("City"). At the time of the entry of the CD, Zone 1 included a housing complex owned and operated by ECHA, which was subsequently closed and demolished by the City. On March 25, 2020, US EPA issued an Amended Record of Decision ("Amended ROD") regarding remediation of what it identified as Modified Zone 1 and the Amended ROD established one set of remediation goals if the use of Modified Zone 1 remained residential and established another set of goals if Modified Zone 1 was purchased by a developer and rezoned for commercial use. On May 26, 2020, the City approved an ordinance rezoning the Property for commercial use. The US EPA and IDA negotiated an Administrative Settlement Agreement for Remedial Action by Prospective Purchaser ("PPA") to require remediation of the Property consistent with the Amended ROD and a SOW. CD Respondents and US EPA negotiated an Administrative Settlement Agreement and Order on Consent for Payment of Certain Operable Unit 1 Response Costs and Providing Financial Assurance Associated with PPA for Remedial Design and Remedial Action at Modified Zone 1 of Operable Unit 1 of the U.S. Smelter and Lead Refinery, Inc. Superfund Site ("ASAOC").

### 1.1 Scope of Work

All Remedial Action (RA) activities will be conducted in accordance with EPA requirements for hazardous waste investigation/cleanup actions under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the Superfund Amendments and Reauthorization Act of 1984 (SARA), and the National Contingency Plan (NCP) dated March 1990. This site is currently listed on the National Priorities List (NPL).

In general, this RA project includes decommissioning six existing on-Property groundwater monitoring wells, excavation of lead and/or arsenic contaminated soil that exceeds Remedial Action Levels to a depth of one-foot below ground surface, placement of one-foot of clean soil in excavated areas, followed by installation of six replacement groundwater monitoring wells.

Based on previous toxicity characteristics leaching procedure (TCLP) testing of soil within one-foot of the surface across the 55 on-Property Decision Units (DUs), the soil will either remain in place (11 DUs), will be directly loaded onto trucks for off-Property disposal (20 DUs), will be stabilized on-Property using a reagent to render the material non-hazardous prior to off-Property disposal (22 DUs) or will be stabilized in place to render the material non-hazardous and will remain on the Property (2 DUs).

In the 42 DUs where one foot of soil will be removed for off-Property disposal, the vertical and horizontal extent of the Decision Unit excavations will be surveyed by a professional land surveyor to confirm excavation depth across the DUs. Once excavation depth is acquired, a geotechnical demarcation barrier will be placed at the base of the excavations to denote the contact between clean and impacted soil. Clean soil and topsoil imported from off the Property will be placed on the geotechnical demarcation barrier, compacted, and graded to original grade. The surface will be restored with sod or seed. Dust control and air monitoring will be performed throughout the project to ensure protection of on-Property workers and nearby residents. Upon completion of soil replacement across the Property, six groundwater monitoring wells will be installed on the Property to replace those removed at the initiation of the project.

## 2.0 Project Organizational Structure

### **Verdantas Project Manager (PM)/Project Coordinator (PC) – David Mustafaga, PG, CPG**

Overall project management will be the responsibility of David Mustafaga.

### **Verdantas Health & Safety Officer (HSO) – Mark Zakrzewski, CSP**

Overall project health and safety management will be the responsibility of Mark Zakrzewski.

### **Verdantas Site Safety & Health Officer (SSHO) – To Be Determined**

Management and coordination of on-site health and safety-related activities will be the responsibility of the Verdantas field representative, acting as the SSHO. The SSHO will be in constant communication with other onsite field personnel, including Verdantas employees, subcontractors, and visitors. The SSHO is responsible for assuring the overall implementation and enforcement of this HASP, incident reporting/investigation, contractor/employee compliance, and similar activities.

The SSHO will be the primary on-site contact; however, if for any reason this person is not on-site during any activities covered under this HASP, an alternate Verdantas employee will be designated the as the SSHO in their absence. The SSHO will have the authority to stop any on-site activities deemed potentially hazardous to human health or the environment and/or is not in substantial compliance with this HASP.

### **Remediation Contractor Project Manager – To Be Determined**

The remediation contractor project manager will be responsible for site control, and safe equipment operation and traffic control, and dust control.

## 3.0 Health & Safety Emergency Action Plan

The Emergency Action Plan provided in this section specifically addresses medical and health & safety-related emergencies that may arise on the Property during completion of this RA project. The overall **Emergency Response Plan for the Remedial Design/Remedial Action** for releases, spills, and other emergencies is provided under separate cover.

### 3.1 Emergency Contacts

Below is a list of emergency contacts for this project:

<b>Local Emergency Contacts</b>	<b>Phone#</b>	<b>Contact</b>
East Chicago Fire Department	911/219-391-8472	Emergency Dispatcher
East Chicago Police Department	911/219-391-8400	Emergency Dispatcher
Lake County EMA	219-660-0000	Emergency Dispatcher
Lake County LEPC	219-755-3549	Emergency Dispatcher

#### **Emergency/Non-emergency Medical Facilities:**

<b>Hospital - Emergency Dept. for non-serious medical emergencies outside business hours of Occupational Clinic</b>  <b>(Directions are provided in Attachment A)</b>	St. Catherine Hospital Emergency Dept. 4321 Fir St., East Chicago, IN 46312 (24 hrs) (219) 392-7200
<b>Occupational Health Clinic for non-serious work-related injuries/illnesses</b>  <b>(Directions are provided in Attachment B)</b>	St. Catherine Occupational Health Clinic 4321 Fir St., Suite 313, East Chicago, IN 46312 Hrs: Mon-Fri 7:30 am – 4:00 pm (219) 392-7424

<b>Project Team Emergency Contacts</b>	<b>Phone#</b>	<b>Contact</b>
Verdantas Project Manager	614-205-1291	Dave Mustafaga
Verdantas Health & Safety Officer	216-905-9087	Mark Zakrzewski
Verdantas Site Safety & Health Officer		TBD
Remediation Contractor Project Manager		TBD

**Federal/State**

Authorized EPA Officer (Remedial Project Manager, RPM)	312-886-7278	Thomas Alcamo
Alternate RPM	312-353-4669	Karen Kirchner
EPA On-Scene Coordinator	312-886-7278	Thomas Alcamo
EPA Emergency Response Unit, Region 5	312-353-2000	Dispatcher
Remedial Project Manager	312-886-7278	Thomas Alcamo
National Spill Response Center	800-424-8802	24-hr Spill Reporting
Indiana Department Environmental Management (IDEM)	888-233-7745 317-233-7745	24-hr Spill Reporting
IDEM Project Coordinator	317-234-0358	Stephanie Andrews
IDEM Alternate Project Coordinator	317-233-2823	Jessica Fliss
Indiana Department of Health	317-233-1325	Operator
EPA Response Contractor	TBD	TBD

### 3.2 Emergency Assembly Area Description (Rally Location)

The emergency assembly area at the Property is the jobsite office trailer. On-site personnel will meet at this location in case of an on-site emergency.

Emergency communications will include one or more of the following methods: verbal, radio, or cell phone communication between on-site personnel, vehicle horn, or air horn. Cell phones will be used to summon emergency services.

### 3.3 Emergency Procedures/Notifications

The PC or SSHO will ensure employees and visitors understand the appropriate procedures to be followed in case of emergency during completion of this RA project. In the event of a medical or other incident, the SSHO will notify the PC and HSO immediately, so that appropriate response efforts can be initiated and managed; however, in cases of life threatening or other serious emergencies, the SSHO will notify the PC and HSO after calling 911 as appropriate.

## 3.4 Medical Emergencies

On-site personnel will be trained/certified in first aid and cardiopulmonary resuscitation (CPR) and will be available to provide first aid or CPR should an injury or illness occur. Minor injuries requiring first aid will be reported immediately to Verdantas' Health & Safety Officer (HSO) and the injured worker's employer. In certain cases, a 24-hr nurse-on-call service (Axiom Medical Consulting) will be used to advise on treatment of minor injuries.

If professional medical treatment is necessary and the injury is not severe or life threatening, the injured worker may be transported by a fellow employee from that company whenever possible to the nearest occupational health clinic (St. Catherine Occupational Health Clinic, 4321 Fir St., Suite 313, East Chicago, IN 46312) or, if after hours, to the nearest hospital Emergency Department (St. Catherine Hospital Emergency Department, 4321 Fir St., East Chicago, IN 46312).

Should the nature of the injury be deemed severe (i.e., life- or limb-threatening) or there is a risk of shock, further injury or bleeding, or other possible medical complications, call 911 immediately to get the injured worker professional medical care.

If the medical emergency occurs in an area where exposure to lead and arsenic is present, rescue operations, if necessary, should be conducted by personnel wearing appropriate personal protective equipment (PPE). The victim should be decontaminated to the maximum extent possible, paying particular attention to the areas of the body or clothing that were in contact with contaminants or the ground. If the injury is minor, a full decontamination should be completed and first aid administered prior to transport. If the victim's condition is serious, at a minimum emergency decontamination (removal of contaminated PPE, etc.) should be completed. If the injured worker can be safely moved by onsite personnel, decontamination and removal of injured personnel from the exclusion zone will be conducted prior to arrival of emergency medical services (EMS). If possible, the injured worker will be moved to the access gate for EMS personnel to treat and/or transport them for off-site treatment to minimize potential exposure of EMS personnel to onsite contaminants.

## 3.5 Severe Weather

Upon first observation of lightning or thunder, all workers outdoors will immediately stop work and enter a substantial building or vehicle until the storm has passed. Outdoor work may resume 30 minutes after hearing the last thunderclap. If a tornado warning siren sounds, all workers will find immediate safety in the jobsite office trailer.

## 3.6 On-site Fire/Explosion

Although the scope of work of this project would not likely cause a fire or explosion on the Property, if a fire or explosion occurs, on-site personnel will immediately call 911 for emergency services. To activate fire department resources, the Lake County Fire Department dispatcher will be notified by calling **911**. The caller will identify that the Site is located in East Chicago, Indiana and be given the Site address.

Fire extinguishers will be present in all on-site vehicles and heavy equipment. On-site workers will not attempt to fight a fire unless they have been specifically trained to do so and the fire can be safely extinguished without the individual putting their health and safety at risk.

In case of an on-site explosion, all personnel should proceed to the rally location (i.e., office trailer where an employee head count can be taken, and coordination of emergency response activities will occur. For details, refer to the Verdantas **Emergency Response Plan for the Remedial Design/Remedial Action**. (Note this rally point may need to be modified based on how site access points are configured by the remedial contractor).

### 3.7 Workplace Violence Events

In the event of a workplace violence event on the Property, all on-site personnel are to immediately leave the Property by the shortest route and away from the area of the workplace violence event. As soon as possible, **911** should be called. The caller will identify the location and the number and physical description of the violent individual(s). Upon leaving the Property, all personnel are to meet at the designated rally point field office trailer and shelter in place until law enforcement personnel arrive and issue an all-clear notice. (Note this rally point may need to be modified based on how site access points are configured by the remedial contractor).

### 3.8 Incident Reporting

All Verdantas employees must report work-related incidents (injuries/illnesses, property or vehicle damage, and spills or releases, etc.) to the Verdantas PC and HSO immediately. Subcontractor employees must notify their supervisor immediately. The contractor supervisor is responsible to notify the Verdantas PC and HSO immediately. Refer to the table above for emergency contact numbers. Incidents are to be reported in person or directly by voice via phone to these individuals. Note that email, voicemail, or text messaging is not acceptable for incident reporting purposes.

Spill/release reporting protocols are provided in to the Verdantas **Emergency Response Plan for the Remedial Design/Remedial Action**.

### 3.9 Post-Incident Procedures

Any Verdantas employee injured on the job (beyond first aid) or involved in a mishap resulting in vehicle or property damage over \$750 in value will be required to submit to a drug and alcohol screen. Subcontractor employees must follow their internal drug and alcohol screening policies.

As soon as possible following any occupational injury, illness, or property damage incident, an incident evaluation will be completed by Verdantas' Health & Safety Officer. Where applicable, this evaluation will include interviews with witnesses and evaluation of the scene of the incident to identify root causes and contributing factors. Findings of the incident evaluation will be shared with the project team to avoid a recurrence of the incident.

## 4.0 Work Area Hazard Assessment

Work area hazard assessment procedures provide a mechanism through which information needed to anticipate, recognize, evaluate and effectively mitigate work area hazards can be obtained. Following is a description of potential physical, environmental, and chemical hazards that may be encountered during completion of the RA project at the Property. If additional tasks, not included in this HASP, are required or additional hazards are identified, this HASP will be amended as needed by the PC, HSO, or SSHO to address those tasks and or hazards. Substantive amendments to this HASP will be documented in Attachment C.

The surveying, drilling, and remediation subcontractors will be provided a copy of this HASP in advance; however, each of those subcontractors, and any other subcontractors who may work on the Property during completion of the RA project, are required to develop and implement a health and safety plan specifically addressing hazards and precautionary measures associated with the specific activities that they will perform on the Property to ensure the safety of their employees.

### 4.1 Underground Utilities

Prior to drilling and the excavation of contaminated soil on the Property, public and private underground utilities will be identified and marked out as appropriate. **Indiana811** will be notified of intrusive work as required prior to drilling and excavation. Subsequently, a private utility locating contractor will identify and locate any active underground utilities on the Property. The location of all active underground utilities will be marked on the Property throughout the project, as needed, to avoid contact with these facilities. Underground utility identification and precautionary procedures will follow Verdantas' *Drilling/Ground Disturbance Operations Safety Program*, provided in Attachment D.

In the event of a utility strike, work should immediately cease, and workers should exit the area. If safe to do so, an assessment of damage will be performed, and the owner/operator of the utility will be immediately notified. If the utility strike poses an imminent danger to human health and safety (e.g., gas leak or sudden release of water pressure), 911 will immediately be called. The caller will identify that the Site is located in East Chicago, Indiana and be given the Site address. Work in the area should not reinitiate until the utility has been repaired and the hazard has been eliminated.

### 4.2 Overhead Utilities

Precautionary measures will be employed to avoid onsite equipment (tree removal equipment, excavators, backhoes, etc.) and on-site dump trucks with beds in a dumping position from encroaching within the minimum safe distance from overhead utilities. The minimum safe distance from overhead electrical lines is specified by OSHA based on and voltage of the overhead lines. Based on the activity and necessity of working near overhead electrical or other utility lines, onsite traffic control signs and/or barricades or dedicated spotters will be used to prevent encroachment within the applicable minimum safe distance. If spotters are employed, they will have the sole duty to observe operations near overhead lines and to maintain constant communication with equipment operators, truck drivers, etc. either verbally, by hand signals, or by radio to ensure safety of on-site personnel and overhead utilities. The SSHO and supervisor of the subcontractor



conducting work that may encroach on overhead utilities will be responsible for determining the effective precautionary measures to be followed during this project.

The following protocol are to be followed whenever onsite equipment or trucks may potentially encroach on the minimum safe distance (listed below).

- Is any equipment to be within 20 feet of an overhead utility (0-200 kV)? **(Y/N)**  
Note: If >200 kV, ensure no equipment may encroach within the minimum safe distance listed below using barricades to prevent equipment encroachments.
  - If "yes", the following documentation is needed:
- Is the overhead utility an electric power line? (Y/N) \_\_\_\_\_.
  - If "yes" what is the voltage in the line? \_\_\_\_\_ kV.
- List effective precautions taken to avoid encroaching on the minimum safe distance or to eliminate the potential hazard: \_\_\_\_\_

Note any work within 20 feet of any overhead utility <200 kV requires written authorization by the PC and HSO).

#### **OSHA Minimum Safe Distances Around Overhead Power Lines**

<u>Line Voltage</u>	<u>Minimum Safe Distance</u>
Up to 50 kV	10 feet (Note: Verdantas min. = 20 ft without authorization)
50 to 200 kV	15 feet (Note: Verdantas min. = 20 ft without authorization)
200 to 350 kV	20 feet
350 to 500 kV	25 feet
500 to 750 kV	35 feet
750 1,000 kV	45 feet

### **4.3 Cold Stress/Weather Conditions**

Because of the schedule of this RA project, on-site personnel working outdoors may be exposed to cold weather conditions and wind, rain, or snow that may lead to cold stress hazards. Adequate rain gear and cold weather gear is necessary to minimize this hazard, along with dressing in layers to adjust to varying temperatures throughout the day and physical activity levels. Also, workers exposed to cold and/or wet weather conditions are to take breaks as needed to warm up inside a heated vehicle or jobsite trailer or office. Refer to Verdantas' **Working in Cold Environments Safety Program**, provided in Attachment E for details.

### **4.4 Heat Stress/Weather Conditions**

Because of the schedule of this RA project, on-site personnel working outdoors may be exposed to hot, humid, and sunny weather conditions that can lead to heat stress. Workers exposed to hot/humid weather conditions are to regularly take breaks to drink water and cool down inside an air-conditioned vehicle or jobsite trailer or office. Refer to Verdantas' **Working in Hot Environments Safety Program**, provided in Attachment E for details.

### **4.6 On-Site Traffic Control / Driving Safety**

Effective on-site traffic control of equipment, personnel vehicles and particularly dump truck traffic will be the responsibility of the remediation contractor. Potential traffic control measures may include one or more of the following: traffic control signs, traffic cones and/or barricades as

appropriate to restrict traffic flow and limit potential traffic conflicts. The maximum on-site speed limit will be 10 mph on paved areas and 5 mph on unpaved areas to reduce potential for collisions and vehicle-related fugitive dust generation, as indicated on the January 2022 U.S EPA factsheet "[Fugitive Dust control Measures and Best Practices.](#)"

On-site, all drivers will avoid backing whenever possible or will park their vehicles so that the first movement will be forward to avoid backing-related property damage or injuries. Whenever possible, dump truck traffic will also be managed to avoid backing. Where backing is unavoidable, drivers will ensure backup alarms are properly functioning, a spotter is used to direct the driver, or extreme caution will be used by the driver while backing slowly.

Equipment operators, drivers of personnel vehicles, and dump truck drivers are not permitted to use a cell phone (either hands-free or hands-on) while operating equipment or driving on the Property.

## 4.7 Property Access, Security, and Work Area Controls

Access to the Property is through a locked gate on the eastern side of the Property adjacent to the East Chicago Housing Authority building near the intersection of McCook Avenue and E. 149<sup>th</sup> Place. During soil hauling, truck traffic will enter and exit at a gate at the south end of the Property at E. 151<sup>st</sup> Street. All gates will be locked after hours or when project activities are not ongoing. Ensuring safe Property access, on-site security, and control of work areas will be the responsibility of the remediation contractor.

Note that working alone in remote areas of the Property may pose a hazard to worker safety and security. Based on proposed on-site activities and Property conditions, no single individual worker will be permitted to work alone in a remote area of the Property away from other onsite personnel.

Any trespasser(s) on the Property will be asked to leave work areas and the local police should be notified if the trespassers fail to comply. In the event trespasser(s) enter work areas, work should immediately cease, workers should exit the area, and the EPA RPM should be notified. Work should not restart until the trespasser(s) have left the Property.

The SSHO, remediation contractor supervisor, or other on-site personnel on the Property are to stop work and contact local police, then notify the PC any time on-site personal security concerns arise. If necessary, the PC may consider use of a private security company or off-duty police officer at the Property to assure worker safety and security of the Property.

## 4.8 Work Zones and Decontamination Plan

Establishment and implementation of effective work zones and specific decontamination plan for equipment will be the responsibility of the remediation contractor. An Exclusion Zone, Contamination Reduction Zone, and Support Zone will be established for this project.

The Exclusion Zone is the zone where potential worker exposure to contamination may occur. This area will be clearly demarcated by the remediation contractor using cones, signs, and/or barriers and caution tape. Access points will be established to regulate the personnel and equipment entering and exiting this zone. Workers inside this area will be equipped with the proper PPE and follow defined procedures in order to protect themselves from exposure to the contaminants in this zone, based on site conditions and ambient air screening.

The “Contamination Reduction Zone” lies just outside of the Exclusion Zone. This zone acts as a buffer between the Exclusion Zone and the Support Zone to reduce the probability of cross contamination. Decontamination of personnel and equipment leaving the Exclusion Zone will occur in this zone.

The “Support Zone” is the outermost zone and borders the Contamination Reduction Zone. The Support Zone shall be positioned upwind of both the Exclusion Zone and the Contamination Reduction Zone and will remain free of contaminated clothing and PPE. It is in the Support Zone that the administrative and support personnel will remain to regulate the activities within the Exclusion and Contamination Reduction Zone.

The standard OSHA Level C PPE decontamination protocol is provided below:

1. Wash gloves and/or boot covers using soap and water and water rinse.
2. Remove securing tape from wrists and ankles.
3. Remove disposable coveralls (without boots).
4. Remove disposable boot covers and/or outer gloves.
5. Remove and wash respirator with soap and water and water rinse.
6. Remove inner gloves and wash hands and face with soap and water and water rinse.

For modified Level D PPE, follow steps above as applicable if protective equipment is worn.

## 5.0 Chemical Hazards

The chemicals of concern (COCs) at the Property are lead and arsenic in surficial soil. Copies of Verdantas' safety programs and Safety Data Sheets (SDSs) for lead and arsenic are provided in Attachment F for reference as well as copies of the Agency for Toxic Substances and Disease Registry (ATSDR) **ToxFAQs** sheets for lead and arsenic.

Engineering controls, such as dust control, administrative controls, such as proper safe work procedures, and personal protective equipment (PPE) are required as a precautions against potential routes of exposure to these COCs, which includes:

1. Incidental ingestion of contaminants contained in soil (such as may occur through poor personal hygiene or decontamination practices).
2. Inhalation of contaminants contained in dust from soil at the Property; and
3. Dermal contact with and/or absorption of contaminants contained in soil.

Dust monitoring will be conducted in accordance with the Air **Monitoring Plan**.

### 1. Particulate Matter (PM) – PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub>, and TSP

MetOne Instruments, Inc., E-Sampler Dual Ambient Monitor/Sampler will be used to simultaneously measure Particulate Matter (PM) fractions in four channels: PM<sub>10</sub>, PM<sub>2.5</sub>, PM<sub>1</sub>, and total suspended particulates (TSP). The particulate monitors will be programmed to alert the users and the remote monitors if the Action Level is exceeded.

### 2. Metals: Lead and Arsenic

The MetOne E-Sampler Dual Ambient Monitor/Sampler will be equipped with a 47-mm mixed cellulose ester filter (MCEF) cassette, inserted in-line with the aerosol stream to collect samples that can be analyzed for lead and arsenic. The 47-mm filter cassette will be submitted to ALS Laboratory Group in Cincinnati, Ohio, for analysis for lead and arsenic, in accordance with National Institute for Occupational Safety and Health (NIOSH) Method 7300 or equivalent, in the frequency as described in Section 3.4.2.

### 3. Personal Exposure Monitoring

When personal exposures are expected to be greater than the Occupational Safety and Health Administration (OSHA) Action Level for lead or arsenic, personal exposure monitoring will be conducted using a 37-mm MCEF connected in series with tubing to a personal sampling pump (such as the Casella Apex2 IS Plus Sampling Pump). The samples will be collected in accordance with NIOSH Analytical Method 7300 and submitted to ALS Laboratory Group in Cincinnati, Ohio, for analysis.

## 5.1 Lead

Lead has been documented in onsite soils at concentrations exceeding Remedial Action Levels (RAL) standards. This RA project includes excavation, mixing, and loading of contaminated soil into trucks for offsite disposal. These activities may expose workers to lead. Lead enters the body primarily through inhalation and ingestion, therefore, effective engineering controls (i.e., dust control), administrative controls (safe working practices), and PPE are required to reduce potential exposure. Dust control will be the responsibility of the remediation contractor and will be

monitored on-site for both worker and off-site receptor exposures. Based on real-time onsite conditions, workers in Decision Units that exceed TCLP standards for lead will be required to wear chemical-resistant gloves, disposable coveralls and respirators with particulate filters. Respirators will be worn in active work zones where excavation or handling of contaminated soils is occurring, or soil stabilization is occurring until quantitative testing, as described in the AMP, indicates concentrations below OSHA exposure standards. Additionally, drinking, eating, and smoking are not permitted in these work areas. Workers leaving these areas must remove potentially contaminated PPE, decontaminate reusable PPE (i.e., hard hats, respirators, etc.) and wash hands and face before eating, drinking, or smoking. Equipment operators inside cabs with HEPA air filtration are not required to wear respirators or coveralls. Below are OSHA worker exposure standards for lead.

OSHA PEL (8-hr TWA): 30 mg/m<sup>3</sup> (general industry and construction)

NIOSH REL (8-hr TWA): 50 mg/m<sup>3</sup>

Copies of Verdantas' safety program and SDS for lead are provided in Attachment F for reference as well as copies of the ATSDR **ToxFAQs** sheet for lead.

## 5.2 Arsenic

Arsenic has been documented in onsite soils at concentrations exceeding RAL standards and is considered a potential occupational carcinogen by NIOSH. This RA project includes excavation, mixing, and loading of contaminated soil into trucks for offsite disposal. These activities may expose workers to arsenic. Arsenic enters the body primarily through inhalation ingestion, and skin absorption, therefore, effective engineering controls (i.e., dust control), administrative controls (safe working practices), and PPE are required to reduce potential exposure. Dust control will be the responsibility of the remediation contractor and will be monitored on-site for both worker and off-site receptor exposures. Based on real-time onsite conditions, workers in Decision Units that exceed TCLP standards for lead and/or arsenic will be required to wear chemical-resistant gloves, disposable coveralls and respirators with particulate filters. Respirators will be worn in active work zones where excavation or handling of contaminated soils is occurring; or soil stabilization is occurring until quantitative testing as described in the AMP, indicates concentrations below OSHA exposure standards. Additionally, drinking, eating, and smoking are not permitted in these work areas. Workers leaving these areas must remove potentially contaminated PPE, decontaminate reusable PPE (i.e., hard hats, respirators, etc.) and wash hands and face before eating, drinking, or smoking. Equipment operators inside cabs with HEPA air filtration are not required to wear respirators or coveralls. Below are OSHA worker exposure standards for arsenic.

OSHA PEL (8-hr TWA): 10 ug/m<sup>3</sup>

NIOSH Ceiling: 2 mg/m<sup>3</sup>

Copies of Verdantas' safety program and SDS for lead are provided in Attachment F for reference as well as copies of the ATSDR **ToxFAQs** sheet for lead.

## 5.3 Triple Super Phosphate (Soil Stabilization Material)

Stabilization of lead in soil that exceeds TCLP standards will involve mixing the soil with triple super phosphate 0-46-0 (TSP), confirmation testing, then loading and transportation of the stabilized soil

for off-site disposal or replacement onsite. TSP is a granular material but loading/unloading and mixing with soil may create nuisance dust. Below are OSHA worker exposure standards for TSP.

OSHA PEL (TWA): 15 mg/m<sup>3</sup> (total)  
5 mg/m<sup>3</sup> (respirable)

NIOSH REL (TWA): 1 mg/m<sup>3</sup>  
NIOSH STEL/Ceil: 3 mg/m<sup>3</sup>

TSP is an eye, skin, and respiratory irritant. The safety data sheet (SDS) for this material is provided in Attachment G. The remediation contractor is responsible for soil stabilization methodology and avoiding generation of dust from handling or mixing TSP with contaminated soil. If on-site personnel may be exposed to dust from TSP handling or mixing with contaminated soil, proper PPE must be worn to protect against dermal and eye contact and dust inhalation. This may include goggles, air purifying respirator with particulate cartridges, disposable coveralls, etc. and implementation of safe work practices such as not permitting eating, drinking, or smoking in the work areas and providing washing stations for onsite staff.

PPE requirements for this project are outlined in Section 8.0, below.

## 6.0 General Task Hazard Assessment

Task hazard assessment is conducted to anticipate, recognize, evaluate and effectively mitigate task-specific hazards. Following is a general description of potential hazards that may be encountered during completion of the RA project at the Property and applicable mitigation measures. If additional tasks, not included in this HASP, are required or additional hazards are identified, this HASP will be amended as needed by the PC, HSO, or SSO to address those tasks and/or hazards. Substantive amendments to this HASP will be documented in Attachment C.

### 6.1 Well Decommissioning and Reinstallation

Verdantas personnel will coordinate well decommissioning and well reinstallation activities with the drilling subcontractor, including ensuring that all underground utility notifications are made, potential for nearby overhead utility hazards are addressed, and on-site review of other site-specific hazards and safety protocols. The drilling contractor will be provided a copy of this HASP in advance but will be responsible for task-specific safety precautions for well decommissioning and reinstallation activities as part of their health & safety plan. Verdantas personnel will observe and document well decommissioning and reinstallation activities.

### 6.2 Clearing and Grubbing

Safe clearing and grubbing procedures at the Property will be the responsibility of the remediation contractor. Clearing and grubbing activities may include operation of chain saws, woodchippers, and heavy equipment to process and/or load trees and other on-site vegetation for offsite disposal. Verdantas personnel will coordinate its activities with the remediation contractor to ensure that underground utility notifications are made, overhead utility hazards are addressed, other Property-specific hazards are addressed and safety protocols, including required PPE are followed.

### 6.3 Nearby On-Road Traffic Control / Driving Safety

Control of truck traffic into and out of the Property will be the responsibility of the remediation contractor. To eliminate project-related truck traffic in the adjacent neighborhood east of the Property, all truck traffic will enter and exit the Property from E. 151<sup>st</sup> Street, located south of the Property. If on-road traffic into or out of the Property becomes problematic, the remediation contractor will assign a traffic control person (flagger) to ensure safe and efficient entry to and exit from the Property.

### 6.4 Heavy Equipment Operation

Safe operation of heavy equipment (i.e., excavators, backhoes, skid steers, graders, compactors, dump trucks, etc.) will be the responsibility of the remediation contractor. The remediation contractor will be provided a copy of this HASP in advance but will be responsible for task-specific safety precautions for clearing and grubbing, on-site traffic control, soil excavation and handling, loading/unloading, grading, soil stabilization, placement of geotextile demarcation fabric, and other associated activities as part of their health & safety plan.



Verdantas personnel will coordinate its activities with the remediation contractor to ensure hazards are addressed and safe work procedures are adhered to.

## 6.5 Soil Stabilization

Safe operation of heavy equipment to stabilize lead and/or arsenic contaminated soil prior to off-site disposal will be the responsibility of the remediation contractor. The remediation contractor will be provided a copy of this HASP in advance but will be responsible for task-specific safety precautions for mixing the contaminated soil with triple super phosphate and other associated activities as part of their health & safety plan.

Verdantas personnel will coordinate its activities with the remediation contractor to ensure hazards are addressed and safe work procedures and any PPE requirements are adhered to.

## 6.6 Confirmatory Sampling of Stabilized Soil

Verdantas personnel will collect confirmatory soil samples in areas where soil stabilization is performed. Sampling will include use of a shovel, hand trowel, or other sampling tool as appropriate. Samplers will take regular breaks or alternate roles as needed because of the physical nature of sample collection, PPE worn during sampling, and the number of samples to be collected to reduce fatigue and potential for heat stress or musculoskeletal injuries.

Protective work gloves are required while using sample collection tools. Chemical-resistant (i.e., nitrile) gloves will be worn over Kevlar glove liners while handling samples and sample glassware. Tyvek or poly booties will be worn while walking in the soil stabilization areas. Additionally, based on conditions in the sampling area, additional PPE (beyond standard OSHA Level D) may include Tyvek coveralls and respiratory protection to protect against direct contact or inhalation of dust.

Job Safety Analyses (JSAs) associated with tasks anticipated to be completed during RA field activities are provided in Attachment H. If additional tasks, not included in this HASP, are required or additional hazards are identified, this HASP will be amended as needed by the PC, HSO, or SSHO to address those tasks and or hazards. Substantive amendments to this HASP will be documented in Attachment C.

## 6.7 Surveying

A subcontracted land surveying crew will survey site features and ground surface and excavation elevations periodically throughout completion of this project. At a minimum, Tyvek or poly boot covers will be worn while walking in DUs containing contaminated soil. Additionally, based on real-time on-site conditions, additional PPE (beyond standard OSHA Level D) may include Tyvek coveralls and respiratory protection to protect against direct contact or inhalation of dust containing lead, arsenic, or super triple phosphate.

Job Safety Analyses (JSAs) associated with tasks anticipated to be completed during RA field activities are provided in Attachment H. If additional tasks, not included in this HASP, are required or additional hazards are identified, this HASP will be amended as needed by the PC, HSO, or SSHO to address those tasks and or hazards. Substantive amendments to this HASP will be documented in Attachment C.



Note that the surveying, drilling, and remediation subcontractor will be provided a copy of this HASP in advance; however, each of those subcontractors, and any other subcontractors who may work on the Property during completion of the RA project, are required to develop and implement a health and safety plan specifically addressing hazards and precautionary measures associated with the work that they will perform on the Property to ensure the safety of their employees.

Finally, daily tailgate safety meetings will be led by the SSHO before beginning work each day to discuss tasks, potential associated hazards, and hazard mitigation approaches during implementation of the work. A copy of the Verdantas employee HASP acknowledgment form and Tailgate Safety Meeting documentation form are provided in Attachment I.

## 7.0 Hazard Communication

The Hazard Communication program applies to all work operations where employees may be exposed to hazardous substances during normal working conditions and/or emergencies. Onsite Verdantas personnel will receive lead and arsenic awareness training in conjunction with Verdantas' safety programs for lead and arsenic, provided in Attachment F. The hazards and precautions of working with triple superphosphate outlined in the SDS for that material will also be reviewed with all onsite personnel who may be exposed to that material. All subcontractors, including equipment operators, laborers, surveyors, etc. will also be made aware of lead, arsenic, and TSP hazards and precautionary measures by their employers. Copies of the ATSDR **ToxFAQs** sheets for lead and arsenic and the SDS for TSP, are provided as additional references in Attachments F and G, respectively.

### 7.1 Responsibilities

The Verdantas PC is responsible for implementing a Hazard Communication program specific to this project, including:

1. Compile and maintain a complete list of hazardous substances present in on-site media, and/or used at the Property by subcontractors or other parties as part of the RA project.
2. Acquire and compile any additional SDSs, to be kept in a readily accessible location at the jobsite trailer/office at the Property.
3. Apply and maintain labels and other forms of warning to containers stored on the Property during completion of the RA project.
4. Ensure that Verdantas employees are trained on the hazards of Property-specific hazardous substances, labeling, signs and symptoms, protective measures, and where to obtain more information.
5. Ensure that all subcontractors provide their employees training on the hazards of Property-specific substances, labeling, signs and symptoms, protective measures, and where to obtain more information.

The Hazard Communication program information shall be readily accessible to all employees. SDSs for projects will be kept either in the HASP or in conjunction with the HASP.

### 7.2 Employee Information and Training

Employees who are potentially exposed to hazardous chemicals will be provided information and training at the time of initial assignment and whenever new chemicals are introduced. Employees shall be informed of the following:

1. the requirements of the Hazard Communication standard;
2. any activity where hazardous chemicals are present;
3. the location and availability of Hazard Communication program information, including the required list(s) of hazardous chemicals and SDSs.
4. methods to detect the presence or release of a hazardous chemical in the workplace;
5. physical and health hazards of the chemicals in the workplace;
6. measures employees can take to protect themselves against hazards (e.g., work practices, use of PPE, and emergency procedures); and

7. details of the Hazard Communication program (e.g., labeling, SDSs, and how to obtain and use appropriate hazard information).

All Verdantas employees working on the Property must review and acknowledge understanding of the HASP. A copy of the form is provided in Appendix I.

### 7.3 Subcontractors and Visitors

This project considers the use of subcontractors. However, if a company is subcontracted by Verdantas for on-site work, those workers will review, acknowledge, and comply with Verdantas' HASP, but shall provide a copy of their company's HASP related to their anticipated Property activities, including relevant SDSs for materials transported to the Property and used by the subcontractors while performing specific tasks.

Non-Verdantas personnel (including visitors, other contractors to the client, and government representatives) at the worksite shall be informed of the physical and health hazards of hazardous chemicals that might be encountered while on-site. In addition, non-Verdantas employees will have access to Verdantas' HASP, as appropriate.

## 8.0 Personal Protection Equipment (PPE)

Based on chemical hazards present in on-Property media on the Property and use of TSP as a stabilizing agent, OSHA Level D PPE for physical hazards and Level C PPE for potential inhalation and direct contact hazards will be required during completion of this RA project. OSHA Level A and B PPE is not anticipated to be required during completion of this RA project.

### 8.1 OSHA Level D PPE

At a minimum, all personnel entering the Property are required to wear a hard hat, safety glasses, hi-visibility shirt or safety vest, and safety-toe boots, except when inside a vehicle or jobProperty trailer/office. Earplugs are required when working in high noise areas. At a minimum, work gloves are required for manual tasks.

In certain circumstances, modified Level D PPE may be appropriate, such as wearing protective boot covers and gloves when working on low exposure tasks, such as surveying certain DUs. The determination of appropriate PPE for each specific activity will be the responsibility of the individual employer; however, all workers are encouraged to wear additional PPE as an individual precaution.

### 8.2 OSHA Level C PPE

On-ground personnel working inside a designated Exclusion Zone or Contamination Reduction Zone are required to wear PPE protective against exposure to direct contact with contaminated soil or TSP or inhalation of dust. Specific PPE requirements will be determined by the SSHO and remediation contractor, based on real-time onProperty conditions (such as potential for dust generation) and required activities to be performed. OSHA Level C PPE may include:

- Tyvek or polyTyvek coveralls (based on potential dust or splash hazard)
- Rubber boots or chemical resistant boot covers
- Chemical resistant outer gloves
- Air-purifying respirator with particulate cartridges
- Safety glasses or goggles, and face shield (based on potential dust or splash hazard)

As discussed in Section 4.8 above, all potentially contaminated PPE will be properly disposed of or decontaminated in the Contamination Reduction Zone immediately upon leaving the Exclusion Zone.

## 9.0 Housekeeping and Sanitation

Good housekeeping is a key contributor to incident prevention. The remediation contractor and will be responsible for ensuring good housekeeping in the work areas throughout implementation of this RA project.

Potable water, restrooms, and decontamination shower facilities will be provided for use by onsite personnel. These sanitation facilities will be provided by the remediation contractor.

## 10.0 Safety Training

The health and safety of Verdantas employees, subcontractor personnel, and visitors on the Property is paramount to successful completion of this RA project. As such, all employers are responsible for providing their employees with applicable health and safety training and a workplace where they can do their jobs without work-related injuries or illnesses. All onsite personnel are required, at a minimum, to have completed OSHA HAZWOPER training in compliance with OSHA 29 CFR 1910.120(e) (initial and annual refreshers as applicable). Additionally, employers must provide their employees with applicable company and site-specific safety policies, rules, and procedures. Formal classroom safety training, and OSHA 10-hr and 30-hr. Construction Outreach Courses, are also to be provided where applicable. All employee training must be documented and kept on file by the employer.

On-site superintendents and foremen are responsible for site-specific safety awareness training for employees, ensuring employees are actively involved in identifying and following proper safety procedures and eliminating safety hazards.

Tailgate safety meetings will be held with all onsite personnel daily prior to beginning work on the Property, at a minimum. The Verdantas SSHO and remediation contractor superintendent will lead these meetings by outlining potential hazards and safe practices associated with the work to be performed. Input will be solicited from all on-site personnel to ensure all work is conducted in a healthy and safe manner. Tailgate safety discussions are required:

- (1) at the start of each workday,
- (2) before starting a new task or work effort,
- (3) when risks to health and safety of on-site personnel become known or are observed, or
- (4) immediately following an on-site close call or incident.

All on-site health and safety meetings will be documented and placed in the on-site HASP or project file. A copy of the Tailgate Safety Meeting form that will document these meetings is provided in Attachment I.

## 11.0 Safety Violations and Disciplinary Action

The primary objective of this HASP and the overall safety program is to provide a safe work environment for all workers. The Verdantas SSHO, remediation contractor project manager, and other subcontractor supervisors, as applicable, are responsible for issuing appropriate specific safety instructions to their employees prior to assigning them work and are responsible for coordinating safe work procedures with other subcontractors in the work area to ensure that all activities are accomplished safely. Each worker is individually responsible for complying with the provisions of the on-site safety instructions, their employers' HASP, and overall safety program. Violations of safety policies and procedures will result in disciplinary actions by the individual's employer, up to and including removal from the Property.

## 12.0 Medical Surveillance

A medical surveillance program will be instituted for those employees who:

- are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit without regard to the use of respirators, for 30 days or more a year.
- wear a respirator for 30 days or more a year or as required by 29 CFR 1910.134 (OSHA Respiratory Protection Standard);
- are injured, become ill, or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; or
- are members of HAZMAT teams.

Employees will be medically evaluated and qualified prior to being fit tested for a respirator prior to beginning work at the Property. All medical records will be retained according to legal requirements and are available to employees upon request to the Director of Human Resources. Additionally, all project staff working on the Property for 30 days or more will be subject to medical surveillance for potential lead and arsenic exposure, including blood testing immediately prior to assignment at the Property, after six months working on the Property (if applicable), and immediately upon completion of their assignment at the Property. Testing will include the following:

- blood lead and zinc protoporphyrin (ZPP);
- heavy metal panel (includes lead, arsenic, mercury, cadmium, and chromium); and
- basic metabolic panel (BMP, Chem 7 or equivalent) (particularly electrolytes, blood urea nitrogen (BUN), and creatinine).

Results of medical surveillance will be evaluated by an occupational medical physician for determination of exposure and any required action.



## 13.0 Certification by Project Coordinator

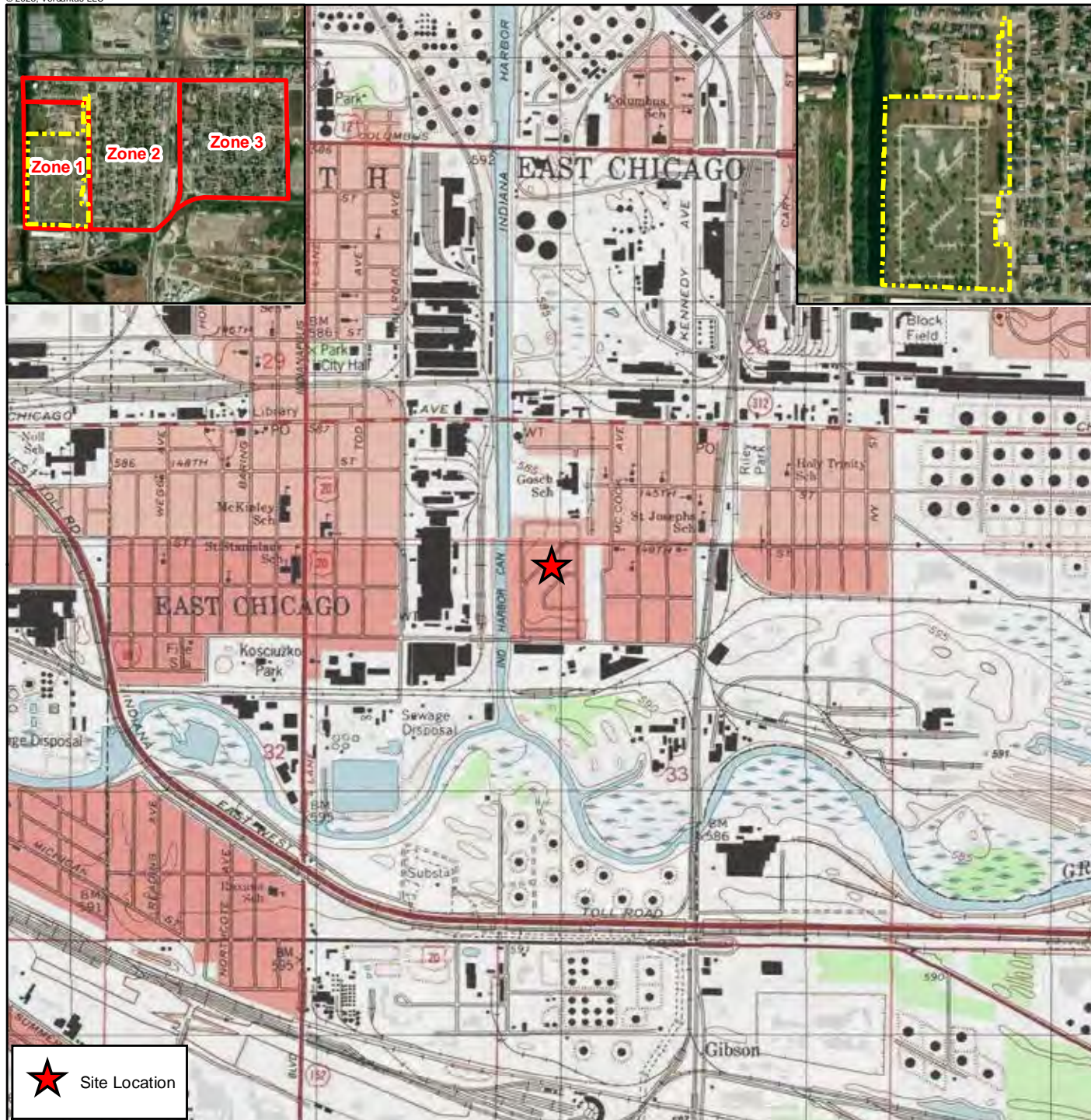
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A handwritten signature in black ink, appearing to read "David B. Mustafaga".

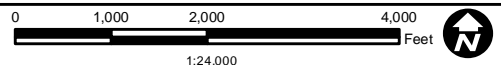
David B. Mustafaga, PG, CPG  
Project Coordinator

## Figures

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**Quadrangles: Whiting and Highland, IN**

Source: The topographic map was acquired through the USGS Topographic Map web service.

The aerial photo was acquired through the Esri Imagery Web Service. Aerial photography dated 2020.

**verdantas**  
 PEOPLE FOCUSED FUTURE

Quality Assurance Project Plan for the RD/RA  
 OU1, Modified Zone 1, USS Lead Superfund Site

**Site Location Map**

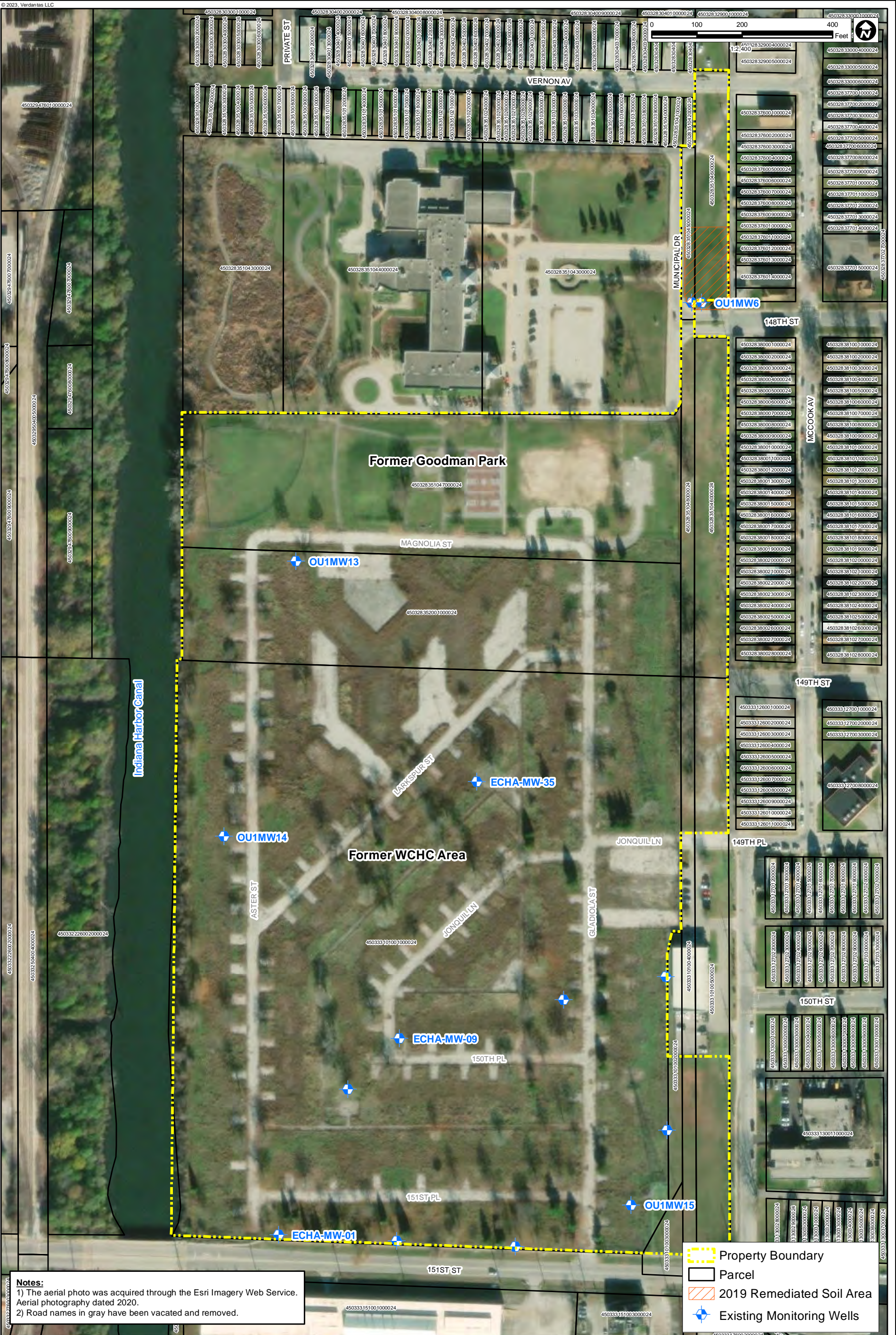
East Chicago, Lake County, Indiana

Date:  
**January 2023**

File Name:  
 15773\_02\_Fig01\_SLM.mxd  
 Edited: 1/20/2023 By: kyusuf

Figure  
**1**





**Notes:**  
 1) The aerial photo was acquired through the Esri Imagery Web Service. Aerial photography dated 2020.  
 2) Road names in gray have been vacated and removed.

Property Boundary  
 Parcel  
 2019 Remediated Soil Area  
+ Existing Monitoring Wells

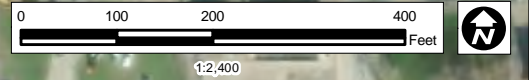


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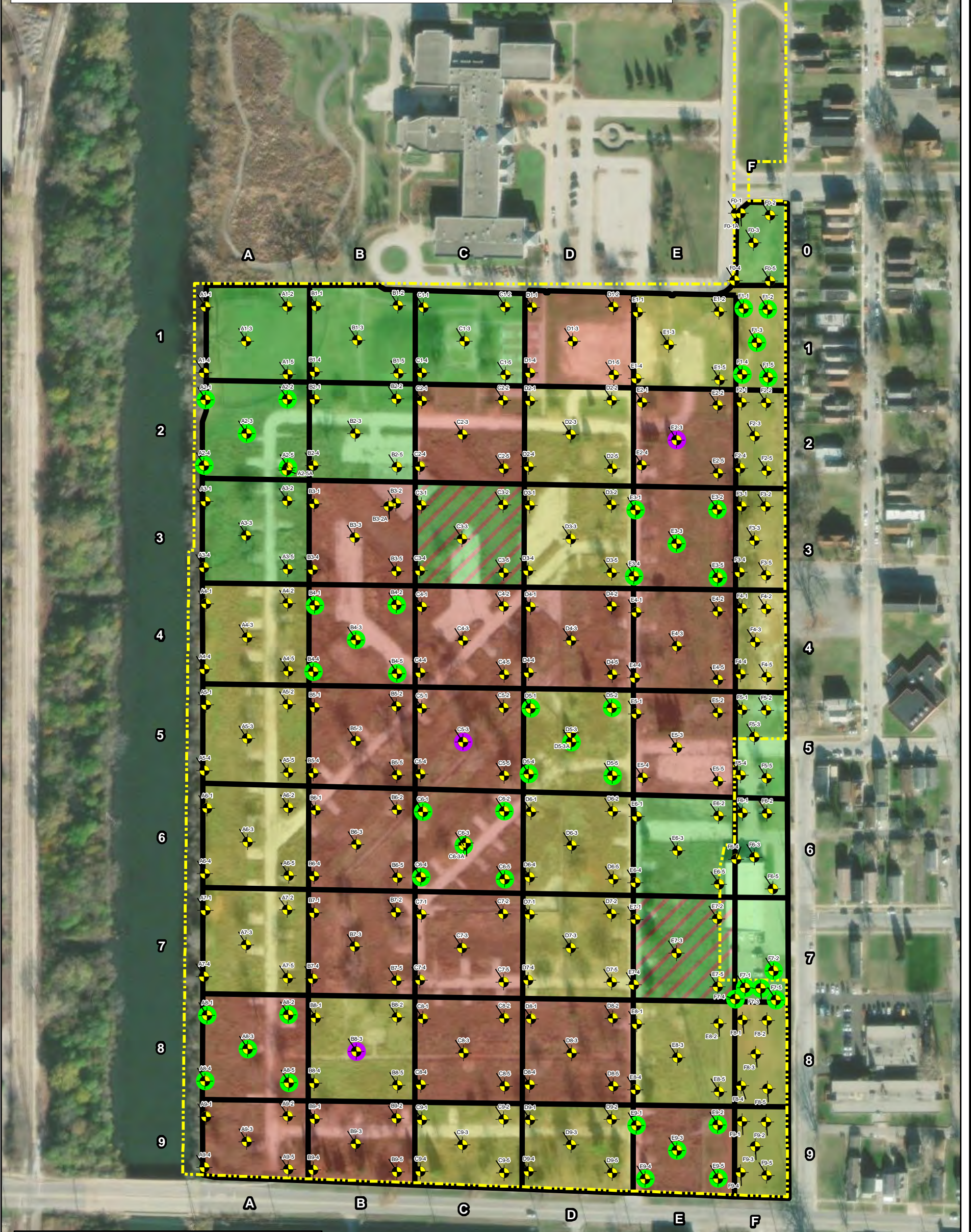
January 2023  
 Health and Safety Plan for Remedial Action Implementation  
 OU1, Modified Zone 1, USS Lead Superfund Site  
**Subject Property Layout**  
 East Chicago, Lake County, Indiana

Figure  
**2**





Property Boundary	Triplicate Sampling Locations
Decision Unit Grid	Decision Unit not requiring Excavation
Composite Sampling Location (0.0' - 1.0')	Decision Unit requiring Excavation and No Stabilization
Waste Disposal Profiling Sample Location	Decision Unit requiring Excavation and Stabilization
	Decision Unit not requiring Excavation but Requires Stabilization (exceeds TCLP Lead)



**Note:**  
The aerial photo was acquired through the Esri Imagery Web Service. Aerial photography dated 2020.



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January 2023  
Health and Safety Plan for Remedial Action Implementation  
OU1, Modified Zone 1, USS Lead Superfund Site

## Remedial Areas Map

East Chicago, Lake County, Indiana

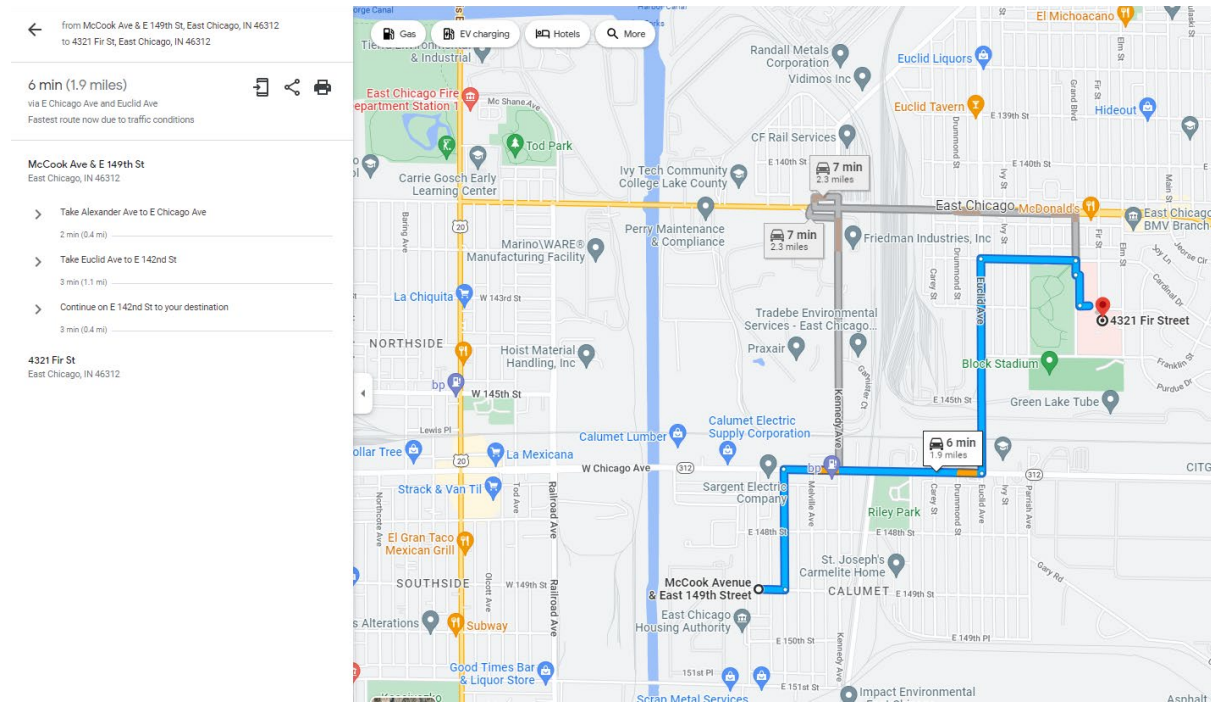
Figure  
**3**



## Attachment A

Emergency Care / Hospital Route Map

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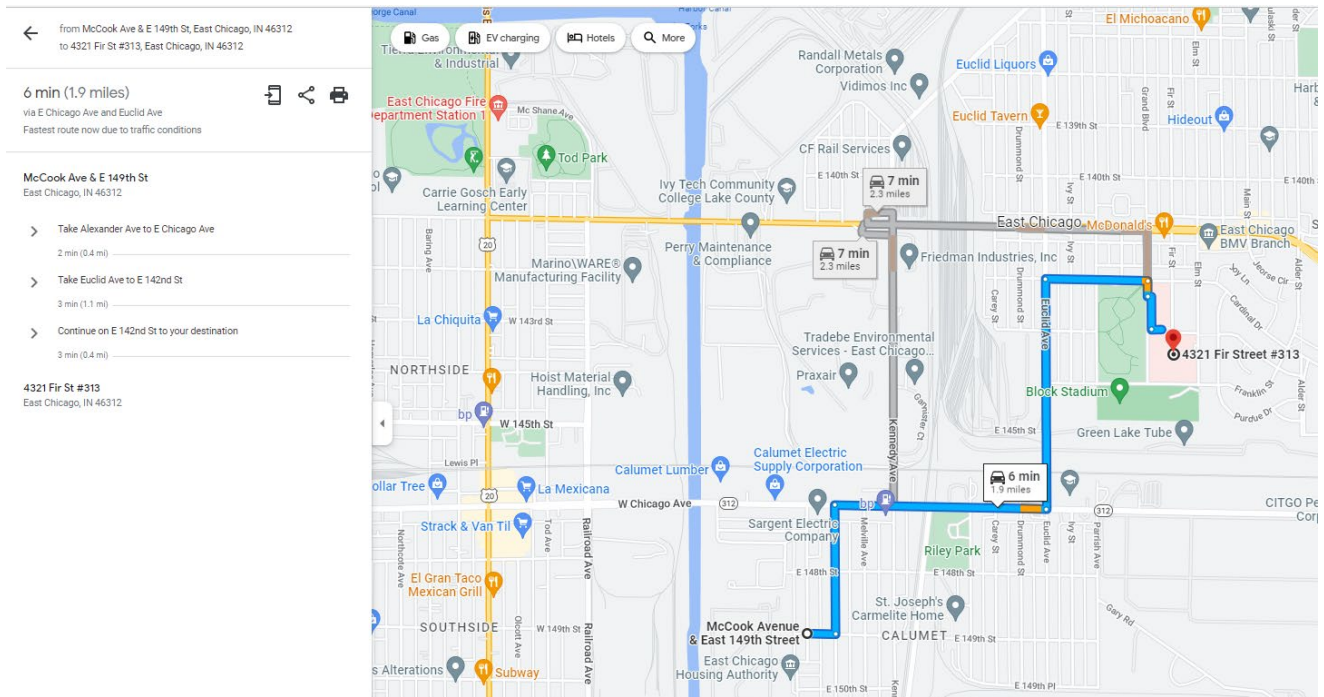


## Attachment B

### Non-Emergency Occupational Clinic Route Map

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## Attachment C

Health & Safety Plan Amendment Form

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**Scope of Work / Change / Amendment / Update / Modification Made to the Plan:**

Reason for Amendment: \_\_\_\_\_

Hazard Evaluation: \_\_\_\_\_

Level of Protection: \_\_\_\_\_

Air Monitoring: \_\_\_\_\_

**PERSON REQUESTING AMENDMENT:**

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

**APPROVAL:**

Name: \_\_\_\_\_

Project Manager: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

## Attachment D

Safety Program for Drilling/Ground Disturbance Operations

---

## Drilling/Ground Disturbance Operations

### OBJECTIVE

The objective of this program is to protect workers from hazards that may be encountered during drilling/ground disturbance operations and to avoid damage to underground and overhead utilities. Verdantas itself does not perform drilling/ground disturbance operations; however, we subcontract contractors who perform this work. Therefore, we must act as stewards to ensure that drilling/ground disturbance operations are completed without incident on our jobsites.

If our client or site owner has a drilling/ground disturbance safety program that is more stringent, it shall take precedence; however, this document provides Verdantas employees with procedures and processes for the prevention of damage to underground and overhead utilities and shall be used when a client/site owner does not have a program in place. Note that Verdantas employees are not permitted to operate or directly participate in drilling/ground disturbance operations (except for those cases where hand-held soil drilling and sampling equipment are used). This procedure applies to all drilling/ground disturbance operations.

### KEY RESPONSIBILITIES

**Health & Safety Officer (HSO):** The HSO is responsible for developing and implementing this program, conducting unannounced work site safety assessments, and ensuring compliance with the program requirements.

**Area Safety Leads (ASLs):** The ASL in each area is responsible for implementing this program, conducting unannounced work site safety assessments, and ensuring compliance with the program requirements.

**Project Managers:** Project Managers are responsible for the overall safe completion of their projects, including the safety of Verdantas field staff, subcontractors, visitors, the general public, and protection of underground and overhead utilities during drilling/ground disturbance operations.

**Site Safety Officer (SSO):** The Verdantas Site Safety Officer (SSO) is designated by the Project Manager in the site-specific HASP to be the lead Verdantas representative on the jobsite. The SSO is responsible for identification of hazards to people, property, and the environment associated with our work, and safe implementation of fieldwork to be completed on their projects. This includes adherence to the site-specific HASP to ensure the safety of other on-site Verdantas field staff, subcontractors, visitors, and the general public and protection of underground and overhead utilities during drilling/ground-penetration operations.

## Drilling/Ground Disturbance Operations

### Background: Utility Protection

Although Verdantas does not directly perform drilling/ground-penetration operations, we are responsible for ensuring that all reasonable precautions are taken to avoid contacting or damaging underground utilities on our jobsites and the potential physical and health hazards that may result. A number of precautionary steps are necessary to perform drilling/ground-penetration projects safely, particularly at highly developed private property. In general, these steps include identifying available utility records and confirming their accuracy, conducting evaluations/surveys of proposed drilling/ground-penetration locations and, if those utility location efforts are unsuccessful, to ensure that precautionary clearing techniques are used to avoid damage to any underground utilities that may be encountered.

### General Requirements

Before any drilling/ground disturbance operations are conducted, the **Pre-Drill/Excavate Utilities and Structures Checklist** (Attachment 1) and **Permit to Work - Ground Disturbance Form** (Attachment 2) must be completed by the Site Safety Officer or designee prior to commencing drilling/ground disturbance operations at the site and approved in writing by the Project Manager.

### Utilities and Pre-work Site Inspection

The location of public and private underground installations must be determined before drilling/ground disturbance operations begin. This will include use of the nationwide 8-1-1 one-call program and may also include a private utility locating contractor if the client does not have accurate records (as-built drawings) of all underground installations in the proposed work area.

If public utility companies or owners do not respond within 48 hours to the request to locate public underground utility installations, or cannot establish precise location of these installations, Verdantas' drilling/ground disturbance subcontractor may proceed, provided a private utility locating contractor has performed a survey/investigation of suspected underground facilities in the proposed drilling/ground disturbance areas and after **Pre-Drill/Excavate Utilities and Structures Checklist** (Attachment 1) and **Permit to Work - Ground Disturbance Form** (Attachment 2) are completed by the SSO or designee and is approved in writing by the Project Manager.

### **PROCEDURE**

Below is an outline of the underground utility protection precautions we take to identify and avoid underground utility contacts. These precautions are linked to the personnel responsible for performing them. Each of these precautions is documented on the checklists provided in Attachments 1 and 2, and which are included in all HASP templates involving drilling/ground disturbance operations. These checklists must be completed by the SSO, or their designee, and approved in writing by the Project

## Drilling/Ground Disturbance Operations

Manager prior to beginning drilling/ground disturbance activities. Note: Any exceptions to these procedures must be approved in writing by the ASL or HSO before drilling/ground disturbance operations begin.

**Project Manager Responsibilities:** Project Managers (or their designees) are responsible for the following underground utility protection precautions:

1. Obtain all available information (drawings, photos, etc.) from the client or site owner regarding underground utilities on the client's site. If the client is not the owner of the site, then the Project Manager must attempt to obtain available utility information directly from the site owner or via the client.
2. Obtain written authorization to proceed (including executed contract and task order). If the client does not own the site, the Project Manager must obtain a signed access agreement from the site owner or other written confirmation from the client that drilling/ground disturbance operations are authorized.
3. Ensure that, at a minimum, the subcontractor submits timely "before you dig" notification to public utility owners by calling 811 or by submitting notice via the state-specific notification process (typically 48 hours, excluding weekends and holidays, not to exceed 10 days prior to drilling/ground penetration). Positive responses must be received from all public utilities notified, indicating that no public utilities are in the proposed drilling/ground disturbance area or that utilities are present and have been marked. A best practice is for Verdantas personnel to also submit a "before you dig" notification simultaneously with the drilling/ground disturbance contractor to confirm all public utility responses in the proposed drilling/ground disturbance area(s).
4. Complete the "**Pre-Drill/Excavate Utilities and Structures Checklist**" (Attachment 1) to document that items 1-3 above have been completed.
5. When conducting work on private property, subcontract a private utility locating firm with appropriate equipment (including line tracing, electromagnetic, and ground-penetrating radar at a minimum) to identify and locate known or suspected underground utilities in the proposed drilling/ground disturbance area(s). A list of Verdantas' common private utility location subcontractors with appropriate equipment is provided on the Waypoints Health & Safety site. Note that the Project Manager must ensure that the public utility notification and mark-outs have been completed prior to performing the private utility

## Drilling/Ground Disturbance Operations

locate and that a Verdantas representative is on-site with the utility locator during the private utility location process.

**Site Safety Officer (SSO) Requirements:** The SSO (or designee) is responsible for the following underground utility protection precautions:

1. Confirm that all public utilities on, near, or entering the site (if working on private property) have been identified and marked out by the public utility owners.
2. Meet onsite with the private utility locating representative, and whenever possible, the client or site owner, to identify and locate all known and suspected underground utilities entering/leaving the site in the area of the proposed drilling/ground disturbance work. These may include water, sanitary and storm sewer, septic systems, electric, gas, oil pipelines, steam lines, underground storage tanks and product lines, tunnels/basements/vaults/culverts, and communication lines or other site-specific underground facilities. In situations where all known or suspected underground utilities in a proposed drilling/ground disturbance area cannot be positively located, precautionary clearing techniques must be implemented to a depth beyond the anticipated depth of the unlocated utilities.
3. Complete the “**Permit to Work – Ground Disturbance**” checklist (Attachment 2) to document completion of underground utility protection precautions and obtain written authorization from the Project Manager before drilling/ground disturbance operations begin.

Any drilling/ground disturbance operations within five feet of a known utility will require precautionary clearing techniques to a depth beyond the anticipated depth of the utility.

If one or more known or suspected utility(ies) are in the drilling/ground disturbance area of the jobsite cannot be positively located, then precautionary pre-clearing techniques are required. Precautionary pre-clearing techniques include use of a hand auger, post hole digger, air knife, hydrovac methods, etc. These pre-clearing techniques include the entire diameter of the borehole to a depth beyond the anticipated depth of the known or suspected utility(ies). If environmental soil sampling is necessary in this interval, applicable project-specific methodology to ensure sample integrity.



## Drilling/Ground Disturbance Operations

### **Overhead Utility Protection**

No drilling/ground disturbance operations will be conducted where the mast of the equipment will be within 20 feet of a typical overhead utility (electric line under 200,000 volts) without prior written approval of the HSO or ASL.

In cases where drilling/ground disturbance operations may need to be closer than 20 feet from the overhead utility, the SSO or Project Manager must identify the utilities overhead (electric, telephone, cable, etc.) and voltage of the lines, if electric. Based on the voltage of the lines, the proposed drilling/ground disturbance equipment, the height of the utilities, the height of the drilling/ground disturbance equipment, and other case-specific factors, an exemption can be requested from the HSO or ASL allow these operations within the 20-foot standoff. In no cases can the drilling/ground disturbance equipment be within 10 feet of an overhead electrical utility.

Note that operations near overhead very high voltage electric lines (i.e., more than 350,000 volts) requires additional standoff distances beyond 20 feet, as listed in the **Pre-Drill/Excavate Utilities and Structures Checklist** (Attachment 1). Voltage-specific standoff distances for overhead electrical lines are listed in Attachment 1. The stand-off minimum distances will not be waived for any overhead electrical line over 200,000 volts.

### **Protection of the Public**

In cases where drilling/ground disturbance operations will take place in uncontrolled public areas, Verdantas personnel or subcontractors shall cordon off the active work area prior to the start of drilling/ground disturbance operations using barricades, temporary fencing, or traffic control cones and caution tape, as necessary, for the protection of the public.

Wells, boreholes, pits, shafts, and all similar trip/fall hazards shall be effectively barricaded or covered and posted as necessary to prevent unauthorized access or slip/trip/fall hazards for the public or workers on the jobsite. Similarly, all temporary ground openings of this type shall be backfilled or finished to grade as soon as possible to prevent injury to others.

### **Protection of Workers**

#### **Exposure to Vehicular Traffic**

Workers exposed to vehicular traffic shall be provided with and wear fluorescent green safety vests or other suitable garments that are appropriate for site conditions and made with reflectorized and high-visibility material. Traffic control, including jersey barriers, mobile barricades, traffic cones, or even use of a parked vehicle as an engineering control, will be utilized as appropriate, based on site conditions, exposure duration, and potential exposure to vehicular traffic hazards.

## Drilling/Ground Disturbance Operations

### Worker Exposure to Falling Loads

No workers shall be permitted underneath loads lifted by a cable from the drill/direct-push mast. Verdantas employees are required to stand away from operating drilling/direct-push equipment to avoid being struck by any equipment or tools and to avoid being splashed by any liquids.

### **TRAINING**

All employees involved in drilling/ground disturbance operations shall be trained in the requirements of this program and regulatory requirements before the employee is assigned duties in these operations. Retraining will be performed whenever work site inspections conducted by the ASL or HSO indicate that a worker does not have the necessary knowledge or skills to perform this work.

As needed, training records may include the date(s) of the training, the instructor(s) of the training program, a copy of the written material presented, and the names of the worker(s) to whom the training was given.

# **Drilling/Ground Disturbance Operations**

## **ATTACHMENT 1**

### **PRE-DRILL/EXCAVATE UTILITIES AND STRUCTURES CHECKLIST**

# Drilling/Ground Disturbance Operations

## PRE-DRILL/EXCAVATE UTILITIES AND STRUCTURES CHECKLIST

**Subcontractor (to make notifications):** \_\_\_\_\_

Project Start Date: \_\_\_\_\_

"Before You Dig" Notification Date: \_\_\_\_\_

One Call Ticket #: \_\_\_\_\_

Have positive responses been received?  Yes  No

**Note: It is a best practice for Verdantas to also submit "before you dig" notification for timely mark-outs.**

Notes: \_\_\_\_\_

**DRILLING OR EXCAVATION MAY NOT PROCEED UNTIL A GROUND DISTURBANCE WORK PERMIT IS AUTHORIZED BY THE PROJECT MANAGER, IN ADDITION TO:**

- 1) written authorization to proceed (including executed contract and task order) is provided by the Client,
- 2) the Client or property owner has provided available site plans, has approved a private utility locating service to mark out utilities, has confirmed in writing that private utilities are not located in the proposed drilling/excavation area, or the Project Manager has received authorization from the ASL or HSO;
- 3) an access agreement or written confirmation of access is provided by the Client if the Site is not owned by the client,
- 4) underground utilities are marked out by the local public utility locating service(s) or utility companies, and
- 5) this checklist is completed.

Are reliable site utility drawings available?  Yes  No

Name of Client or property owner representative providing drawings: \_\_\_\_\_

Have locations of Private Utilities been cleared with Client Representative or Property Owner?  Yes  No

Attach a map of the property showing the proposed drilling or excavation location(s) and clearly indicating the area(s) checked for underground utilities or underground structures and the location of aboveground lines.

**OVERHEAD UTILITIES:** Is any work to be conducted within 20 feet of an overhead utility?  Yes  No

If "No", skip to next section. If "Yes", the following documentation is needed: Is the utility an electric power line?  Yes  No

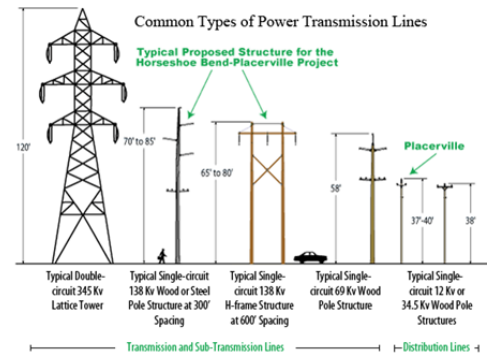
If "Yes", what is the voltage in the line? \_\_\_\_\_ Volts

List precautions taken to avoid entering the minimum safe distance or eliminate the potential hazard: \_\_\_\_\_

**(NOTE: Working within 20 feet of any overhead utility requires authorization by PM and ASL or HSO).**

**OSHA Minimum Safe Distances Around Overhead Power Lines**

Line Voltage	Minimum Safe Distance
Up to 50,000 volts	10 feet (Note: Company minimum is 20 feet without authorization)
50,000 to 200,000 volts	15 feet (Note: Company minimum is 20 feet without authorization)
200,000 to 350,000 volts	20 feet
350,000 to 500,000 volts	25 feet
500,000 to 750,000 volts	35 feet
750,000 to 1,000,000 volts	45 feet



**ATTACHMENT 2****PERMIT TO WORK – GROUND DISTURBANCE**

## Drilling/Ground Disturbance Operations

### PERMIT TO WORK – GROUND DISTURBANCE

**This Permit to Work is required to be Authorized by the Project Manager prior to initiating any ground disturbance project.**

**Project Name/Location:** \_\_\_\_\_

For any item answered "No," additional documentation must be completed before work can proceed.			
1. Has written authorization (executed contract and task order) been received from the client?	Yes	No	
2. If the proposed ground disturbance will occur on a property not owned by our client, a written access agreement from the owner is required. If this condition applies to this project, has the written access agreement been received prior to beginning work?	Yes	No	NA
3. Has a "Before You Dig" notification been submitted within 10 days, but no less than 48 hours prior to the scheduled ground disturbance?	Yes	No	
4. Has the drilling/excavation subcontractor provided documentation confirming that all utilities have been notified and have provided positive responses? Attach a copy of this documentation to the HASP.	Yes	No	
5. Has the client provided accurate site plans ("as-builts") or confirmed in writing that no utilities are in the proposed ground disturbance area(s)? <b>If "NO", a private utility locate is required if breaking ground on private property.</b> (Exception: Rural, undeveloped properties where no evidence of underground facilities exist, and the project manager has authorization of the ASL or HSO.	Yes	No	
6. Have all available records been reviewed that may indicate the location of underground facilities in the proposed disturbance area(s)?	Yes	No	
7. Have all overhead utilities in the proposed work area been identified and will remain a minimum of 20 feet from equipment used for this ground disturbance project?	Yes	No	
8. If the answer to the question above is "NO," have all <u>overhead</u> utility precautions listed in the "Pre-drill Excavate Utilities and Structures Checklist" been performed and documented, including authorization of the HSO or ASL?	Yes	No	
9. Has the "Pre-Drill / Excavate Utilities and Structures Checklist" been filled out?	Yes	No	
10. Has the proposed ground disturbance area(s) been marked on-site, and competent public and/or private line locator(s) marked all underground facilities in the areas where subsurface disturbance activities are to be conducted (except for rural, undeveloped properties, as discussed in item 5, above)?	Yes	No	
11. Have all suspected underground utilities/structures been located? If "No" then pre-clearing is required beyond the anticipated depth of the unlocated utility/structure. Note the depth specified by Project Manager. _____ ft.	Yes	No	
12. Are there any visible features (i.e., pipeline markers, manholes, etc.) without an identified "feed" in the mark-out? If "Yes" - <b>STOP WORK</b> and further evaluate before beginning the ground disturbance	Yes	No	
13. Are copies of all approvals, notifications, and agreements available for field crew reference while on site?	Yes	No	
14. Are precautionary techniques planned (using air knife, hydro-vac, hand auger, or hand digging) for drilling or digging within 5 feet of the known utilities?	Yes	No	
15. If the first _____ feet cannot be cleared has approval from Project Manager been received to proceed?	Yes	No	NA
16. Will ground disturbance include trenching? If so, a Daily Trench Safety Field Report shall be completed each day prior to the start of work. (Attach sufficient copies as needed)	Yes	No	NA
17. If applicable, have provisions been made to address unattended open excavations to provide for the safety of the public, livestock and/or wildlife until the project is completed?	Yes	No	NA

**Person responsible for coordinating/confirming utility verification**

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Project Manager Permit Authorization**

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## Attachment E

Safety Programs for Working in Cold and Hot Environments

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## Working in Cold Environments

### OBJECTIVE

The objective of this program is to provide guidelines for the recognition of cold stress environments and prevention and treatment of cold stress-related illness. This program applies to all Verdantas project sites.

### COLD STRESS AWARENESS

Cold stress can occur during cool, wet, or cold weather when employees are not adequately dressed or when perspiration is present. Employees that are at risk to exposure are those working in the field during cold weather conditions. These employees must be aware of the potential for hypothermia during cool to cold periods, which could be at temperatures as high as 50°F in wet and/or windy conditions. The chart below provides general guidance on the potential for frostbite based on ambient temperature and wind conditions.

### Precautions / Prevention

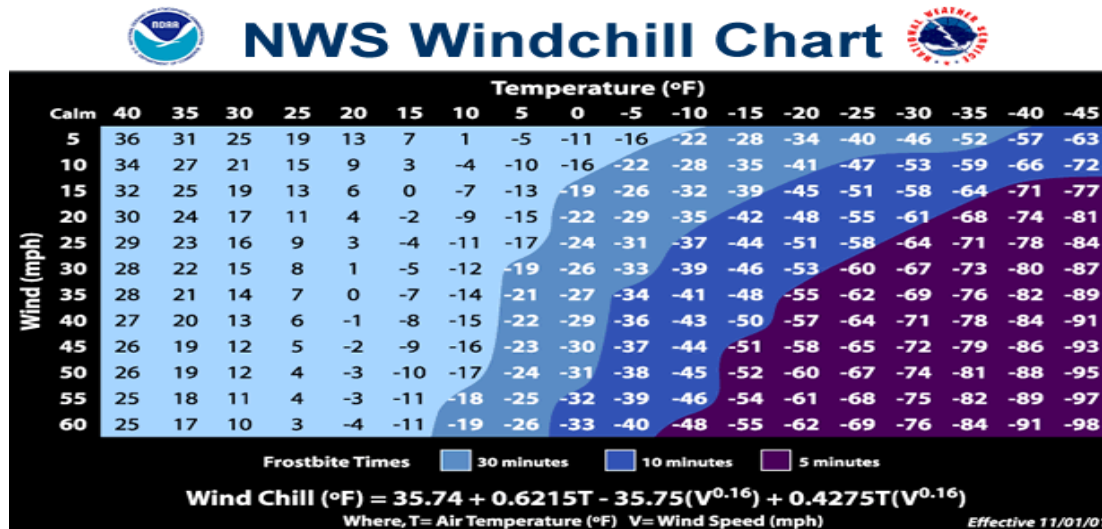
Following are proactive measures that can be taken to avoid cold stress when working in cold environments:

- Employees must wear clothing appropriate to the conditions and level of physical exertion. Wearing layers of clothing allows one to add and remove clothing based on activity level, wind, and weather conditions. Appropriate clothing includes garments that wick away moisture, such as polypropylene; those that trap air, such as wool; those that repel the wind, such as wind-resistant outerwear; and waterproof boots, or over boots;
- adjust work rate and clothing layers to avoid excessive perspiration;
- minimize exposure to wind and precipitation and consult the windchill index above;
- work breaks should be taken as needed to allow employees to warm up, dry off, or change clothes before continuing work;
- Where possible, modify work activities to coincide with weather conditions, such as performing tasks, which require a higher activity level in cooler parts of the day, and conducting the less physical tasks during the warmer time of the day;
- minimize extended periods of inactivity to the extent possible;



## Working in Cold Environments

- Employees and subcontractors should use the buddy system and watch their co-workers for signs of frostbite (if under 32°F) or hypothermia (if under 50°F); and
- be informed of the dangers and destructive potential caused by unstable snow buildup, sharp icicles, and recognize how to prevent accidents caused by them.



### Slip/Trip/Falls and Other Cold Environment Hazards

Employees should also stay alert to other hazards present in cold environments including slick walking/working surfaces and overhead icicles. Regularly used walkways and travel ways should be sanded, salted, or cleared of snow and ice to the extent practicable prior to beginning work.

### Cold Related Conditions – Symptoms and First Aid Care

Workers and supervisors are trained and aware of precautionary measures and symptoms of cold stress so that they can monitor themselves and co-workers or subcontractors. Equally important are first aid measures to effectively address cold-related health conditions. Below is a description of cold stress conditions and recommended first aid care measures to address those conditions.

- **Frostbite**
  - Symptoms: Toes, fingers, cheeks, nose, and ears are particularly susceptible to frostbite. The skin turns red or pink and pain is experienced in the early stage of frostbite. As frostbite develops, the skin may become a dull white or grayish yellow and may feel cold and numb. Pain may not be felt in the later stages. Skin may blister.

## Working in Cold Environments

- Treatment: Cover the affected parts with dry insulated materials and transport the victim to an indoor heated area immediately. Do not rub affected parts in snow or submerge parts in either hot or cold water. Submerge in tepid water (approximately 100°F) until normal skin color returns. **Do not use hot water or hold over an open flame or stove to warm exposed parts.** Injured parts should be loosely bandaged. Keep affected parts elevated. Immediately consult a medical professional anytime a frostbite injury is suspected.
- **Hypothermia**
  - Symptoms: Hypothermia occurs when an individual's core body temperature drops below approximately 95°F. Victims may experience shivering, numbness, weakness in the muscles and joints, and low body temperature. The victim's pulse and breathing rate decreases. The victim may seem drowsy and may become unconscious. If left untreated, death may occur.
  - Treatment: Transport the victim to a warm environment immediately. Remove all wet and restricting clothing and wrap the victim in dry, warm blankets or garments. Warm the victim slowly and provide warm non-caffeinated drinks if the victim is conscious. **Seek medical care immediately for severe hypothermia.**

### Training

Field employees who perform extended outdoor work in cold conditions are trained in first aid and cardiopulmonary resuscitation. Initial and annual training regarding prevention and recognition of health effects of cold exposure and first aid care will be conducted as appropriate.

# Working in Hot Environments

## OBJECTIVE

The objective of this program is to provide guidelines for the recognition of heat stress environments and prevention and treatment of heat stress-related illness. This program applies to all Verdantas worksites.

## HEAT STRESS AWARENESS

Heat stress results when the body is unable to cool itself through normal physiologic mechanisms, such as sweating. Protective clothing may interfere with the body's ability to cool itself, thus increasing the potential for heat stress. The table below provides general guidance on the potential for heat stress based on temperature and humidity. However, dehydration, as well as the radiation from the sun and strenuous physical work contribute to the potential for heat stress. Individual factors, such as physical condition and acclimatization also can contribute to susceptibility for heat stress.

Field staff and supervisors will be trained on how to prevent heat-related illness and on emergency response procedures in responding to a heat-related illness prior to beginning work. Weather, personal factors and physical factors should also be considered prior to assigning or performing a work task in hot environments.

### NOAA's National Weather Service

**Heat Index**  
Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	118	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	126	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

- Caution
- Extreme Caution
- Danger
- Extreme Danger

## Working in Hot Environments

### Precautions / Prevention

The following are proactive measures that can be taken to avoid heat stress when working in hot environments:

- work during cooler hours of the day whenever possible;
- drink abundant amounts of water. Employees working in hot environments should begin drinking water prior to beginning work and regularly throughout the day based on site conditions, PPE requirements, and the level of physical activity. Typically, drinking at least one cup every 15 to 20 minutes or during each rest break is sufficient, as indicated by regular frequency of urination, which is an indicator of sufficient hydration;
- wear light-colored breathable and wicking clothing whenever possible;
- use of cooling devices, such as cooling vests or misting fans should be considered where feasible;
- protect the skin from sun exposure using clothing, shade, or sunscreen;
- avoid working in the sun for extended periods. If possible, erect a temporary canopy to create shade in the work area;
- take frequent rest breaks as needed based on site conditions, PPE requirements, and level of physical activity. These breaks may be inside a vehicle with air conditioning, inside building with air conditioning, or in a shaded, well-ventilated area, preferably away from paved areas that can intensify heat on sunny days; and
- eat light meals to minimize effect of heat stress.

### Acclimatization

Acclimatization is a key factor in an individual's response to heat stress. Acclimatization occurs over a period of several days as an individual's body adapts to continued exposure to hot conditions. Therefore, those workers who are not acclimatized to working in hot conditions should begin their field assignment with reduced workload and heat exposure and should slowly increase exposure over a period of several days.

### Heat Illness – Symptoms and First Aid Care

Workers and supervisors are trained and aware of precautionary measures and symptoms of heat stress so that they can monitor themselves and co-workers or subcontractors. Equally important are

## Working in Hot Environments

first aid measures to effectively address heat illness. Below is a description of heat illness conditions, in increasing level of severity, and recommended first aid care measures to address those conditions.

- **Heat Rash**
  - Symptoms: Red rash, impaired sweating, mild discomfort, and lowered heat tolerance.
  - Care: Allow the victim to rest in a cooler environment and give them water to drink. Cool the victim's skin with cool water.
- **Heat Cramps**
  - Symptoms: Muscle spasms and pain in abdominal muscles and extremities.
  - Care: Allow the victim to rest in a cooler environment. Give the victim at least four ounces of water every fifteen minutes for an hour and monitor their recovery.
- **Heat Exhaustion**
  - Symptoms: Pallor, faintness, dizziness, temporary loss of breath, profuse sweating, clammy/cool skin, dilated pupils, headache, nausea, and vomiting.
  - Care: Allow the victim to rest in a cool environment and remove protective clothing. Give the victim at least four ounces of water every fifteen minutes if they are conscious and can tolerate it. Place the victim in the shock position (lying down with feet elevated). Cool the victim with a fan or applying wet towels or sheets, or air conditioning if available. Monitor the victim closely. Transport the victim to a medical facility or call 9-1-1 if there are no signs of improvement.
- **Heat Stroke – (a life-threatening medical emergency)**
  - Symptoms: Dizziness, nausea, severe headache, constricted pupils, hot dry skin, cessation of sweating, high body temperature, confusion, collapse, delirium, coma, staggering gait, convulsions, and/or loss of consciousness. If not treated immediately, death may occur.
  - Care: **Call 9-1-1 or transport the victim immediately to a medical facility.** If the victim's body is not cooled immediately, irreversible damage to vital organs may develop leading to death. Take the victim to a cool or air-conditioned area and remove protective clothing. **Do not give the victim anything to drink.** Cool victim with cold water, cold compresses, and rapid fanning.

## Working in Hot Environments

### Ultraviolet Radiation

If unprotected, certain employees not normally acclimated to direct solar radiation are susceptible to severe sunburns. Employees should use sunscreen (SPF-15 or greater) when working in sunny conditions, particularly if the employee is prone to burning or if they will be outside working in sunny conditions for a significant amount of time. The combination of hazards of heat stress and ultraviolet burns can be severe and debilitating. Also, long-term unprotected exposure to ultraviolet radiation may increase the likelihood of developing skin cancer. Therefore, employees should monitor each other for safety purposes.

### Training

Field employees who perform extended outdoor work in hot environments are trained in first aid and cardiopulmonary resuscitation. Initial and annual training regarding prevention and recognition of health effects of work in hot environments, and first aid care will be conducted.

## Attachment F

Verdantas Safety Programs for Lead and Arsenic  
Safety Data Sheets for Lead and Arsenic  
ATSDR ToxFAQs Sheets for Lead and Arsenic

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## OBJECTIVE

The purpose of this program is to identify the controls and actions necessary to prevent adverse health effects to Verdantas employees from occupational exposure to lead, and to ensure Verdantas' lead exposure management practices meet regulatory requirements.

This program applies to operations where employees may be exposed to lead while working with lead containing materials during routine maintenance, remedial operations, or emergency situations. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Verdantas employees and subcontractors and shall be used when our client, or the property owner, does not have a program in place or if the program is less stringent.

## LEAD EXPOSURE AND HEALTH EFFECTS

Lead may be encountered in materials such as paints, pipes, batteries, circuit boards, cathode ray tubes, leaded glass, contaminated soil, and demolition/salvage materials. Short-term symptoms to acute lead poisoning are loss of appetite, nausea, vomiting, stomach cramps, constipation, difficulty in sleeping, fatigue, moodiness, headache, joint or muscle aches, and anemia. Long-term (chronic) overexposure to lead may result in severe damage to the blood-forming, nervous, urinary, and reproductive systems.

### Work Practices

Employees must abide by any signs, labels or assessment reports indicating the presence of lead-containing materials. Appropriate work practices must be followed to prevent the lead-containing materials from being disturbed unnecessarily. As a precaution, when working around potential lead-containing materials hands and faces should be washed if there is any possible contact. If employees are working immediately adjacent to a lead abatement activity and could potentially be exposed to lead due to the inadequate containment of that activity, employees should vacate the area until the enclosure breach is repaired, or an initial exposure assessment is performed that documents that work may safely continue.



## RESPONSIBILITIES

### Managers / Supervisors

In coordination with the Health & Safety Officer (HSO), Project Managers must develop and implement written project/task specific lead exposure management procedures prior to the start of activities to reduce exposure to below the permissible limits.

- Inform personnel of work that has the potential of exposure to lead.
- Properly train individuals responsible for monitoring areas of exposure.
- Provide documented medical surveillance when appropriate.
- Provide affected employees with initial and annual lead management training.
- Inform the HSO of upcoming work involving lead-containing materials, allowing the HSO to provide any necessary monitoring.
- Adhere to appropriate controls of lead hazards, including elimination/substitution, engineering controls, administrative controls, and personal protective equipment (PPE) are used to safeguard worker health and safety.
- Provide employees with appropriate PPE and confirm they are properly trained in its use and care, including respiratory protection, full-body disposable clothing and gloves when the Action Level may to be met or exceeded.
- Comply with the lead exposure management procedure.
- Coordinate waste management and disposal activities ensuring waste with lead-containing materials is disposed of only at an approved facility.

### Health & Safety Officer (HSO)

- Coordinate air sampling and monitoring activities, and as necessary, modify the lead exposure management procedures to reflect exposure monitoring data.
- Maintain the lead exposure management procedure, notifying management of any regulatory changes and ensuring compliance with federal and state requirements.
- Coordinate initial and annual refresher training activities for affected employees.
- Coordinate the medical surveillance program for employees exposed to lead above the Action Level for more than 30 days per year.

### Affected Employees

- Comply with the lead exposure management procedure, consulting with the Project Manager, supervisor, or HSO to follow the proper precautions and to wear PPE when required.
- Comply with the medical surveillance program.
- Attend initial and annual refresher training, as applicable.
- Wear respiratory protection equipment and other specified PPE as required by the project/task specific program.
- Maintain respiratory protection equipment in good working order, notifying the Project Manager, supervisor, or HSO of any problems prior to starting work.
- Review safety data sheets or consult with the Project Manager to identify any container with lead-containing material.
- Leave the work area to wash if direct skin contact is noted or if PPE has been compromised.

### ■ PROCEDURE

#### Written Compliance Program

The Project Manager is responsible to develop and implement written project/task site specific lead exposure management procedures prior to the start of activities to reduce exposure to or below the permissible limits if exposure is possible. The procedure shall include engineering controls, administrative controls/work practices, PPE, documentation of air sampling, including the source of lead. A description of each task in which lead is emitted should be outlined and employees shall be trained prior to work beginning. The project-specific program shall be reviewed and updated as needed at least every 6 months.

#### Permissible Exposure Limits

- Per OSHA regulation, employees shall not be exposed to greater than 50 micrograms per cubic meter of air ( $50 \mu\text{g}/\text{m}^3$ ), time-weighted average, during an 8-hour workday. This permissible exposure limit (PEL) includes the use of respiratory protection. If an

employee is exposed more than 8 hours in any one workday, the maximum PEL ( $\mu\text{g}/\text{m}^3$ ) shall be calculated by using the following formula:

- 400/hours worked in the day
- For example:  $400/12 \text{ hours} = 33.33 \mu\text{g}/\text{m}^3$
- If respirators are used to supplement engineering and/or work practice controls, the respirator's protection factor may be used to determine compliance with the PEL.

### **Exposure (Air) Monitoring**

- Exposure is defined in this section to be any employee who is not wearing a respirator to meet the Action Level and monitoring requirements in this section.
- Initial air samples shall be representative of the employee's regular, daily activities.
- Initial breathing air sampling results:
  - If the initial monitoring is less than the Action Level, monitoring need not be repeated unless there has been a production, process, control, or personnel change which may result in new or additional exposure to lead.
  - If the initial determination or subsequent monitoring reveals employee exposure to be at or above the Action Level but below the PEL, monitoring must be performed at least every six (6) months, with the cycle continuing until two (2) samples taken at least seven (7) days apart are below the action level.
  - If the initial determination exceeds the PEL, monitoring will be performed quarterly until two (2) samples taken at least seven (7) days apart are below the PEL but above the Action Level, and the monitoring frequency described above will be used.
  - Within 15 working days after the receipt of the results of any monitoring, Verdantas shall notify affected employees of these results either individually in writing or by posting the results in an appropriate location that is accessible to affected employees.
  - Whenever the results indicate that the exposure, without regard to respirators, exceeds the PEL, Verdantas shall include in the written notice a statement that the PEL was exceeded, and a description of the corrective action taken or to be taken to reduce exposure to or below the PEL.

## CONTROL MEASURES

### Engineering Controls

- If an employee may be exposed to lead above the PEL for 30 or more days in a year, engineering controls, and/or administrative controls, will be implemented to reduce the exposure to or below the PEL. If such controls are not feasible, Verdantas must demonstrate and document the reasons.
- Respiratory protection will be used if engineering and administrative controls are not effective in reducing the exposure to or below the PEL.
- If air is re-circulated back into the workplace, the system must be equipped with a HEPA (high efficiency particulate air) and backup filter, and a system to monitor the lead level will be installed.
- When using mechanical means to remove lead-containing paints or coatings, use equipment which is equipped with a HEPA collection system to reduce airborne lead dust.
- Whenever possible, use a wet system to reduce airborne lead dust.
- Whenever possible, substitute lead material with non-leaded material.

### Administrative Controls

- Administrative controls will include job rotation schedules to reduce employee exposure below the PEL.
- When exposure to lead is at or above the PEL, Verdantas shall provide break areas, decontamination, changing, shower, and hygiene facilities.
- Regulated access signs will demarcate the lead exposure regulated work areas. Signs should not be removed or defaced. The signs will read as follows:

WARNING  
LEAD WORK AREA  
POISON  
NO SMOKING OR EATING

### Personal Protective Equipment

- Respirators shall be used during the period required to install or implement control if engineering and work practices are insufficient, as well as for emergency use.
- PPE will be selected based on its ability to prevent absorption, inhalation and ingestion and will be provided to employees at no cost.
- PPE will reflect the needs of the employee based on work conditions, amount and duration of exposure and other known environmental factors.
- If respirators are required, they will be NIOSH-certified, and employees must follow Section 14 - *Respiratory Protection Program*.
- An employee may choose a NIOSH-certified powered, air purifying respirator (PAPR) at no extra cost to the employee. The respirator shall be used during the period necessary to install or implement engineering or work practice controls.
- Gloves, hats, vented goggles, and/or disposable shoe covers shall be provided at no cost. Protective clothing shall be clean and dry. Protective clothing shall be cleaned, laundered, repaired, and replaced as necessary and disposable clothing shall be identified and handled properly.

### Decontamination

While we don't conduct lead abatement / removal specifically, there are sites where basic decontamination procedures should be followed due to the presence of lead in soil or other media.

- PPE
  - All disposable garments should be removed once work is completed and disposed of properly, immediately before leaving the site.
  - Reusable clothing should be placed in closed container once work is completed and laundered separately.
  - If respirators are worn because of the possibility of exposure, they should be placed in a closed container once work is completed and deep cleaned. Respirator cartridges should be disposed of, not reused.
  - Hard hats should be cleaned to remove any possible dust accumulation that could contain traces of lead.

- Equipment
  - All equipment should be decontaminated onsite and wash/rinse water contained for proper disposal.
- Clean Up
  - Wash face and hands thoroughly with soap and water immediately and shower once home.

### **Medical Surveillance**

- A baseline blood sample shall be obtained prior to any lead exposure.
- Employees who are or may be exposed to lead above the Action Level for more than 30 days per year will be included in a medical surveillance program which is performed by or under the supervision of a licensed physician at no cost to the employee.
- Any employee with elevated blood levels shall be temporarily removed from project(s) where lead exposure is possible.
- Blood sampling and monitoring will occur at least every 6 months for each affected employee until two consecutive blood samples and analysis are acceptable.
- Employees shall be notified in writing within 5 days of blood sampling results when lead levels are not acceptable.
- Blood sampling shall occur on a monthly during a removal period for each employee removed from exposure to lead due to an elevated blood lead level.
- Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the level for medical removal Verdantas shall provide a second (follow-up) blood sampling test within two weeks after receipt of results of the first blood sampling test.

### **Medical Removal**

- Employees will be removed from exposure to lead when an exposure meets or exceeds the Action Level on each occasion that a periodic and follow-up blood sampling test indicates that blood lead level is at or above 60 µg/100 g of whole blood.
- An employee will be removed from exposure to lead when the average of the last three (3) blood sampling tests indicates the employee's blood level is at or above

50 µg/100 g of whole blood (the employee need not be removed if the last blood sampling test shows blood lead level to be at or below 40 µg/100 g of whole blood).

- If the employee's blood lead level does not decline adequately with 18 months of removal, the employee will be offered a medical examination to determine if the employee may be returned to their former job status.
- Medical Removal Protection requirements of 1910.1025(k)(2) shall be followed.

## RECORDKEEPING

- Medical surveillance records shall be maintained for 30 years after termination of employment.
- Exposure monitoring records shall be maintained for 30 years after completion of the project.
- Exposure and medical monitoring records shall be made available to affected employees or their representatives and to regulatory agencies upon request.

## TRAINING

Training shall be provided to employees who have the potential for exposure to lead prior to the time of initial assignment and annually thereafter. Affected employees are required to attend training programs. Training will include the following:

- Distribute a copy of the content of the lead standard and Appendices A and B of the regulation and its readily availability for employees;
- Content of any compliance plan in effect;
- Access to information and training records;
- Specific operations where lead exposure is or could result in being above the action level;
- Engineering controls and work practices associated with the job;
- Purpose, proper selection, fitting, use, and limitations of respirators;
- Purpose and description of the medical surveillance program, which will include potential health effects, and the medical removal program;

- Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used, except under the direction of a licensed physician.

Training records will be provided upon request.



## OBJECTIVE

The objective of this program is to identify the controls and actions necessary to prevent adverse health effects to Verdantas employees and subcontractors from occupational exposure to arsenic and to meet regulatory requirements.

This program applies to operations where Verdantas employees may be exposed to arsenic. When work is performed on a client's worksite, the Client's program shall take precedence, however, this document covers Verdantas employees and subcontractors and shall be used when a Client has no program, or it is less stringent.

## BACKGROUND

Arsenic exposure in the workplace occurs through inhalation, ingestion, dermal or eye contact. Chronic exposure to arsenic can lead to dermatitis, pigmentation keratosis of the skin, vasospasticity (limited blood flow in small blood vessels near the surface of the skin), wart formation, decreased nerve conduction velocity, and lung cancer. Acute exposures can cause lung distress and death.

## RESPONSIBILITIES

### Project Managers and Supervisors shall:

- In coordination with the Health & Safety Officer (HSO), develop and implement written project/task specific arsenic exposure management procedures prior to the start of activities to reduce exposure to below the permissible limits.
- Inform personnel of work that has the potential of exposure to arsenic.
- Verify individuals responsible for monitoring areas of exposure are properly trained.
- Provide documented medical surveillance, if required.
- Confirm that affected employees receive initial and refresher training, as appropriate.
- Inform the HSO of upcoming work involving arsenic-containing materials, allowing the HSO to proactively provide any necessary monitoring and training to workers.
- Confirm employees have appropriate personal protective equipment (PPE) and are properly trained in its use and care, including respiratory protection.
- Verify employees adhere to the arsenic compliance program.

## Arsenic Program

### Health & Safety Officer (HSO) shall:

- Implement a compliance program when exceeding the NIOSH recommended exposure limit (REL) of 2 micrograms per cubic meter of air ( $2 \mu\text{g}/\text{m}^3$ ) (ceiling – 15-minute exposure). A written compliance program shall be implemented when the REL of  $2 \mu\text{g}/\text{m}^3$  is exceeded to reduce exposures to below the REL by means of engineering and work practice controls.
- Maintain the arsenic compliance program, notifying management of any regulatory changes and ensuring compliance with federal and state requirements.

### Affected employees shall:

- Comply with the arsenic compliance program, consulting with the Project Manager or HSO to follow the proper controls, safe work procedures, and confirm PPE are used when required.
- Comply with the medical surveillance program.
- Attend required training.
- Wear respiratory protection equipment and other specified PPE as required by the project/task specific control program.
- Maintain respiratory protection equipment in good working order, notifying the Project Manager or HSO of any problems prior to starting work.
- Review safety data sheets or consult with the Project Manager to identify any container with arsenic-containing material.

## PROCEDURE

### Written Arsenic Compliance Program

A written arsenic compliance program shall be developed and implemented as part of a site-specific health and safety plan (HASP) if arsenic poses an occupational exposure hazard. The minimum criteria to be contained within the written program shall include:

- A description of each operation where arsenic may become airborne above the REL, controls in place, employee job responsibilities and maintenance practices.

## Arsenic Program

- A description of the specific means that will be employed to meet compliance.

The arsenic compliance program will be reviewed and updated annually or more frequently as necessary, to reflect status of the program. The written plan must be available at the worksite for examination by affected employees. The arsenic compliance program must be provided for examination and copying upon request of affected employees, their representatives, or regulatory personnel, as appropriate.

### Exposure Monitoring

At those worksites where airborne arsenic concentrations may exceed the REL, determinations of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to inorganic arsenic over an eight (8) hour period.

### Housekeeping and Maintenance for Cleaning and Maintaining Dust Collection Equipment

Housekeeping Plan – For worksites where airborne arsenic may exceed the REL, a written housekeeping and maintenance plan shall be kept which shall list appropriate frequencies for carrying out housekeeping operations and for cleaning and maintaining dust collection equipment. The plan shall be available for inspection by the Assistant Secretary.

### Respiratory Protection & Other Personal Protective Equipment

Respiratory protection shall be provided in accordance with 29 CFR 1910.134 (see the Respiratory Protection Program in Section 14).

Respiratory protection will be used during the following circumstances while working with arsenic:

- periods necessary to install or implement feasible engineering or work-practice controls;
- work operations, for which Verdantas establishes that engineering and work-practice controls are not feasible or are not yet sufficient to reduce employee exposures to below the REL; and
- emergencies.

## Arsenic Program

Where the possibility of skin or eye irritation from inorganic arsenic exists, and for workers working in regulated areas, Verdantas shall provide at no cost to the employee and require that employees use appropriate and clean protective work clothing and equipment including, but not limited to, Tyvek coveralls, gloves, shoe covers, and face shields or goggles. This PPE shall be used in these cases to minimize the potential for direct contact with skin or eyes.

### Signage

For worksites where airborne arsenic is anticipated to exceed the REL, adequate signs shall be in place demarcating the regulated areas. If Verdantas' client does not post needed signage, then Verdantas will verify proper signs are placed at the work location.

The Client or Verdantas shall post signs demarcating regulated areas bearing the following legend:

DANGER  
INORGANIC ARSENIC  
CANCER HAZARD  
AUTHORIZED PERSONNEL ONLY  
NO SMOKING OR EATING  
RESPIRATOR REQUIRED

### Change Rooms & Showers

In cases where protective clothing such as disposable coveralls and shoe covers are not in place, Verdantas shall provide for its employees working in regulated areas or subject to the possibility of skin or eye irritation from inorganic arsenic, clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment. Verdantas shall assure that its employees working in regulated areas or subject to the possibility of skin or eye irritation from inorganic arsenic shower at the end of the work shift.

### Medical Surveillance

Verdantas shall establish and maintain an accurate record for each employee subject to medical surveillance, as appropriate, based on assignment.

**TRAINING**

A training program shall be provided for employees who are potentially exposed to arsenic prior to initial assignment and refresher training will be provided thereafter, based on assignment.

Training materials shall be readily available to affected employees. All training shall be documented.

## Lead Safety Data Sheet (SDS)

### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

#### Lead

Signal Word  
**DANGER**

Flinn Scientific, Inc. P.O. Box 219, Batavia, IL 60510 (800) 452-1261  
Chemtrec Emergency Phone Number: (800) 424-9908

Pictograms

### SECTION 2 — HAZARDS IDENTIFICATION

Hazard class: Acute toxicity, oral and inhalation (Category 4). Harmful if swallowed or inhaled (H302+H332). Do not eat, drink or smoke when using this product (P270). Avoid breathing dust and fumes (P261).



Hazard class: Carcinogenicity (Category 2). Suspected of causing cancer (H351). Obtain special instructions before use (P201). Do not handle until all safety precautions have been read and understood (P202). Use personal protective equipment as required (P281). Elemental lead is a possible human carcinogen (IARC-2B).



Hazard class: Reproductive toxicity (Category 1A). May damage fertility or the unborn child (H360).

Hazard class: Specific target organ toxicity, repeated exposure (Category 2). May cause damage to organs through prolonged or repeated exposure (H373). Do not eat, drink or smoke when using this product (P270).

### SECTION 3 — COMPOSITION, INFORMATION ON INGREDIENTS

Component Name	CAS Number	Formula	Formula Weight	Concentration
Lead Forms: foil, sheets, shot, strips, and wire.	7439-92-1	Pb	207.19	

### SECTION 4 — FIRST AID MEASURES

**If exposed or concerned:** Get medical advice or attention (P308+P313).

**If inhaled:** Remove victim to fresh air and keep at rest in a position comfortable for breathing (P304+P340).

**If in eyes:** Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do so. Continue rinsing.

**If on skin:** Wash with plenty of water.

**If swallowed:** Rinse mouth. Immediately call a POISON CENTER or physician (P301+P310+P330).

### SECTION 5 — FIRE FIGHTING MEASURES

Finely divided lead dust is flammable.

Molten metal may release toxic fumes of lead.

In case of fire: Use a tri-class dry chemical fire extinguisher.

NFPA Code  
None established

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**SECTION 6 — ACCIDENTAL RELEASE MEASURES**

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Sweep up, place in sealed bag or container and dispose. Ventilate area and wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

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**SECTION 7 — HANDLING AND STORAGE**

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Flinn Suggested Chemical Storage Pattern: Inorganic #1. Store with metals and metal hydrides. Use fume hood when handling powder form.

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**SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION**

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Wear protective gloves, protective clothing, and eye protection. Wash hands thoroughly after handling. Use fume hood when handling powder form.

Exposure guidelines: PEL/TLV 0.05 mg/m<sup>3</sup> (OSHA/ACGIH)

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**SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES**

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Heavy, ductile, gray solid. Odorless.

Boiling point: 1740 °C

Soluble: Dilute nitric acid. Insoluble in water.

Melting point: 327.4 °C

Lead wire also contains 1% antimony (CAS #7440-36-0)

Specific gravity: 11.35

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**SECTION 10 — STABILITY AND REACTIVITY**

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Avoid strong acids, ammonium nitrate, hydrogen peroxide, sodium azide, zirconium, sodium acetylide, and chlorine. Shelf life: Indefinite, if stored properly.

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**SECTION 11 — TOXICOLOGICAL INFORMATION**

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Acute effects: Convulsions, seizures, weakness, muscle cramps, methemoglobinemia.

ORL-Pigeon LD<sub>L0</sub>: 160 mg/kg SKN-RBT LD<sub>50</sub>: N.A.

Chronic effects: Anemia, reproductive hazard, possible carcinogen.

IHL-Human LCL<sub>0</sub>: 10 ug/m<sup>3</sup>

Target organs: Nerves, brain, blood, kidneys, female/male reproductive system

Lead is an IARC Category 2B; Possibly carcinogenic to humans. Lead is classified by NTP as Reasonably Anticipated to be a Human Carcinogen

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**SECTION 12 — ECOLOGICAL INFORMATION**

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Accumulates in soil and water. Bioaccumulates in animals. Very toxic to aquatic life with long lasting effects

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**SECTION 13 — DISPOSAL CONSIDERATIONS**

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Please review all federal, state and local regulations that may apply before proceeding.

Flinn Suggested Disposal Method #27d is one option.

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**SECTION 14 — TRANSPORT INFORMATION**

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Shipping name: Not regulated. Hazard class: N/A. UN number: N/A.

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**SECTION 15 — REGULATORY INFORMATION**

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TSCA-listed, EINECS-listed (231-100-4), RCRA code D008.

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**SECTION 16 — OTHER INFORMATION**

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This Safety Data Sheet (SDS) is for guidance and is based upon information and tests believed to be reliable. Flinn Scientific, Inc. makes no guarantee of the accuracy or completeness of the data and shall not be liable for any damages relating thereto. The data is offered solely for your consideration, investigation, and verification. The data should not be confused with local, state, federal or insurance mandates, regulations, or requirements and CONSTITUTE NO WARRANTY. Any use of this data and information must be determined by the science instructor to be in accordance with applicable local, state or federal laws and regulations. The conditions or methods of handling, storage, use and disposal of the product(s) described are beyond the control of Flinn Scientific, Inc. and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING,

STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

N.A. = Not available, not all health aspects of this substance have been fully investigated.

N/A = Not applicable

**Consult your copy of the Flinn Science Catalog/Reference Manual for additional information about laboratory chemicals.**

**Revision Date:** January 26, 2016

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### Arsenic Safety Data Sheet (SDS)

#### SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

##### Arsenic

Signal Word  
**DANGER**

Flinn Scientific, Inc. P.O. Box 219, Batavia, IL 60510 (800) 452-1261  
Chemtrec Emergency Phone Number: (800) 424-9442

Pictograms

#### SECTION 2 — HAZARDS IDENTIFICATION

Hazard class: Acute toxicity, oral (Category 3). Toxic if swallowed (H301). Do not eat, drink or smoke when using this product (P270).



Hazard class: Acute toxicity, inhalation (Category 3). Toxic if inhaled (H331). Avoid breathing dust or fumes (P261).



Hazard class: Carcinogenicity (Category 1). May cause cancer (H350). Obtain special instructions before use (P201). Do not handle until all safety precautions have been read and understood (P202). Use personal protective equipment as required (P281).



Hazard class: Chronic hazards to the aquatic environment (Category 1). Very toxic to aquatic life with long lasting effects (H410).

Arsenic is classified as an IARC Group 1-Carcinogenic to Humans and NTP Known To Be Carcinogenic to Humans.

#### SECTION 3 — COMPOSITION, INFORMATION ON INGREDIENTS

Component Name	CAS Number	Formula	Formula Weight	Concentration
Arsenic	7440-38-2	As	74.92	
Synonyms: Arsenous hydride				

#### SECTION 4 — FIRST AID MEASURES

Call a POISON CENTER or physician if you feel unwell (P312). **If inhaled:** Remove victim to fresh air and keep at rest in a position comfortable for breathing (P304+P340). **If in eyes:** Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do so. Continue rinsing (P305+P351+P338). **If eye irritation persists eyes:** Get medical advice or attention (P337+P313). **If on skin:** Wash with plenty of water (P302+P352). Take off contaminated clothing and wash before reuse (P362). **If swallowed:** Rinse mouth (P330). Immediately call a POISON CENTER or physician (P301+P310).

#### SECTION 5 — FIRE FIGHTING MEASURES

Nonflammable solid. Flammable in the form of dust when exposed to heat or flame or by chemical reactions.

NFPA Code  
None established

When heated to decomposition, may emit toxic fumes.

In case of fire: Use a tri-class dry chemical fire extinguisher.

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**SECTION 6 — ACCIDENTAL RELEASE MEASURES**

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Do not allow solid to become airborne. Wipe up dust with a damp paper towel to avoid generating dust. Place in a sealed bag or container and dispose. Wash spill site after material pickup is complete. See Sections 8 and 13 for further information.

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**SECTION 7 — HANDLING AND STORAGE**

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Flinn Suggested Chemical Storage Pattern: Inorganic #10. Store with sulfur and phosphorus. Keep container tightly closed (P233). Use only in a hood or well-ventilated area (P271). Store in a locked poison cabinet.

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**SECTION 8 — EXPOSURE CONTROLS, PERSONAL PROTECTION**

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Wear protective gloves, protective clothing, and eye protection (P280). Wash hands thoroughly after handling (P264). Use only in a hood or well-ventilated area (P271). Use personal protective equipment as required. Exposure guidelines: PEL/TLV 0.01 mg/m<sup>3</sup> (OSHA/ACGIH); IDLH 5 mg/m<sup>3</sup>

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**SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES**

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Gray powder. Odorless.	Boiling point: 613 °C (Sublimes)
Soluble: Nitric acid. Insoluble in water.	Melting point: 817 °C
Flash point: Not applicable	Relative Density: 5.72
pH: No data available	Partition coefficient: No data available
	Viscosity: No data available

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**SECTION 10 — STABILITY AND REACTIVITY**

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When heated or on contact with acid or acid fumes, it emits highly toxic fumes. Can react vigorously on contact with oxidizing materials. Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine. Shelf life: Indefinite, if stored properly.

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**SECTION 11 — TOXICOLOGICAL INFORMATION**

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Acute effects: Moderately toxic.	ORL-RAT LD <sub>50</sub> : 763 mg/kg
Chronic effects: Carcinogen (IARC-1, NTP-known)	IHL-RAT LC <sub>50</sub> : N.A.
Target organs: Skin, lungs.	SKN-RBT LD <sub>50</sub> : N.A.

---

**SECTION 12 — ECOLOGICAL INFORMATION**

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Very toxic to aquatic life with long lasting effects.

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**SECTION 13 — DISPOSAL CONSIDERATIONS**

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Please review all federal, state and local regulations that may apply before proceeding. Flinn Suggested Disposal Method #27d is one option.

---

**SECTION 14 — TRANSPORT INFORMATION**

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Shipping name: Arsenic; Hazard class: 6.1, Poison; UN number: UN1558.

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**SECTION 15 — REGULATORY INFORMATION**

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TSCA-listed, EINECS-listed (231-148-6). RCRA code D004.

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**SECTION 16 — OTHER INFORMATION**

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STORAGE, USE OR DISPOSAL OF THIS PRODUCT(S).

N.A. = Not available, not all health aspects of this substance have been fully investigated.

N/A = Not applicable

**Consult your copy of the Flinn Science Catalog/Reference Manual for additional information about laboratory chemicals.**

**Revision Date:** February 1, 2016

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# Lead - ToxFAQs™

## What is lead?

Lead is a metal found naturally in the earth's crust. It can be found in all parts of our environment, including air, water, and soil. Lead can combine with other chemicals to make different compounds.



Lead is used in the production of batteries, ammunition, and metal products (solder and pipes). Because of health concerns, the use of lead in paints, ceramic products, caulking, and pipe solder has been dramatically reduced. The use of lead as an additive to automobile gasoline was banned in 1996 in the United States.

## What happens to lead in the environment?

- Lead is an element, so it does not break down.
- When lead is released into the air, it may be transported long distances before it lands and stays on the ground.
- Once on the ground, lead can often stick to soil particles.
- Lead in soil can get into groundwater, but the amount of lead that moves into groundwater will depend on the lead compound and soil type.

## How can I be exposed to lead?

- Eating food or drinking water that contains lead.
- Drinking water from pipes that were soldered with lead can cause exposure.
- Spending time or living in homes with lead-based paints can result in exposure when the paint breaks down and forms dust, which can get on your hands, or into your mouth and nose and be swallowed.
- Spending time in areas where the soil is contaminated with lead.
- Working in a job where lead is used or participating in certain hobbies where lead is used, such as making stained glass.
- Using healthcare products from other countries, alternative treatments, or folk remedies.

**Lead can cause health problems in almost every organ and system in your body.**

## How can lead affect my health?

The effects of lead are the same whether it enters the body by breathing it in or eating it. Lead can affect almost every organ and system in your body. The nervous system is the main target for lead poisoning in children and adults. Long-term exposure can result in decreased learning, memory, and attention, and weakness in fingers, wrists, or ankles. Lead exposure can cause anemia (low iron in the blood) and damage to the kidneys. It can also cause increases in blood pressure, particularly in middle-aged and older individuals. Exposure to high lead levels can severely damage the brain and kidneys and can cause death. In pregnant women, exposure to high levels of lead may cause a miscarriage. In men, it can cause damage to reproductive organs.

# Lead

## How can lead affect children?

Children are more vulnerable to lead poisoning than adults because their nervous system is still developing. Children can be exposed to lead in their environment and before birth from lead in their mother's body. At lower levels of exposure, lead can decrease mental development, especially learning, intelligence, and behavior. Physical growth may also be decreased. A child who swallows large amounts of lead may develop anemia, severe stomachache, muscle weakness, and brain damage. Exposure to lead during pregnancy can also result in premature births. Some effects of lead poisoning in a child may continue into adulthood.

## Can lead cause cancer?

Several agencies and organizations both in the United States and internationally have reviewed studies and made an assessment about whether lead can cause cancer.

- The Department of Health and Human Services (HHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens (causing cancer in people).
- The U.S. Environmental Protection Agency (EPA) has classified lead as a probable human carcinogen.
- The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans, and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

## Can I get a medical test to check for lead?

A blood test is available to measure the amount of lead in your blood. Blood tests are commonly used to screen children for lead poisoning. Your doctor can draw blood samples and send them to appropriate laboratories for analysis. If you think you or anyone in your family has been exposed to lead, contact your doctor, nurse, or poison control center.

## How can I protect my family from lead exposure?

- Avoid exposure to sources of lead.
- Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint.
- If your home contains lead-based paint (built before 1978), or if you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house to remove lead dust and lead tracked in soil.
- Certain water pipes may contain lead, so if you know that pipes have lead solder, you should avoid drinking from that source.
- Check for lead in some products such as toys and jewelry and avoid such products.
- Lead is sometimes in candies imported from other countries or traditional home remedies; find out if yours has any lead and avoid using these products or giving them to children.
- You can learn more about preventing lead poisoning here: <https://www.cdc.gov/nceh/lead/faqs/lead-faqs.htm>

## Want more information?

Call **CDC-INFO** at 1-800-232-4636, or submit your question online at <https://wwwn.cdc.gov/dcs/ContactUs/Form>

Go to ATSDR's [Toxicological Profile for Lead](#)

CDC Lead Poisoning Prevention Program <https://www.cdc.gov/nceh/lead/default.htm>

Environmental Protection Agency <https://www.epa.gov/lead/protect-your-family-exposures-lead>

Go to ATSDR's Toxic Substances Portal: <https://wwwn.cdc.gov/TSP/index.aspx>

If you have any more questions or concerns, you can also find & contact your ATSDR Regional Representative at [http://www.atsdr.cdc.gov/DRO/dro\\_org.html](http://www.atsdr.cdc.gov/DRO/dro_org.html)



This fact sheet answers the most frequently asked health questions (FAQs) about arsenic. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous waste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can cause a discoloration of the skin and the appearance of small corns or warts. Arsenic has been found in at least 1,149 of the 1,684 National Priority List (NPL) sites identified by the Environmental Protection Agency (EPA).

## What is arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenate (CCA) is used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. Organic arsenic compounds are used as pesticides, primarily on cotton fields and orchards.

## What happens to arsenic when it enters the environment?

- Arsenic occurs naturally in soil and minerals and may enter the air, water, and land from wind-blown dust and may get into water from runoff and leaching.
- Arsenic cannot be destroyed in the environment. It can only change its form.
- Rain and snow remove arsenic dust particles from the air.
- Many common arsenic compounds can dissolve in water. Most of the arsenic in water will ultimately end up in soil or sediment.
- Fish and shellfish can accumulate arsenic; most of this arsenic is in an organic form called arsenobetaine that is much less harmful.

## How might I be exposed to arsenic?

- Ingesting small amounts present in your food and water or breathing air containing arsenic.
- Breathing sawdust or burning smoke from wood treated with arsenic.
- Living in areas with unusually high natural levels of arsenic in rock.
- Working in a job that involves arsenic production or use, such as copper or lead smelting, wood treating, or pesticide application.

## How can arsenic affect my health?

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs.

Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small "corns" or "warts" on the palms, soles, and torso.

Skin contact with inorganic arsenic may cause redness and swelling.

Almost nothing is known regarding health effects of organic arsenic compounds in humans. Studies in animals show that some simple organic arsenic

# Arsenic

**CAS # 7440-38-2**

compounds are less toxic than inorganic forms. Ingestion of methyl and dimethyl compounds can cause diarrhea and damage to the kidneys.

## How likely is arsenic to cause cancer?

Several studies have shown that ingestion of inorganic arsenic can increase the risk of skin cancer and cancer in the liver, bladder, and lungs. Inhalation of inorganic arsenic can cause increased risk of lung cancer. The Department of Health and Human Services (DHHS) and the EPA have determined that inorganic arsenic is a known human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic arsenic is carcinogenic to humans.

## How can arsenic affect children?

There is some evidence that long-term exposure to arsenic in children may result in lower IQ scores. There is also some evidence that exposure to arsenic in the womb and early childhood may increase mortality in young adults.

There is some evidence that inhaled or ingested arsenic can injure pregnant women or their unborn babies, although the studies are not definitive. Studies in animals show that large doses of arsenic that cause illness in pregnant females, can also cause low birth weight, fetal malformations, and even fetal death. Arsenic can cross the placenta and has been found in fetal tissues. Arsenic is found at low levels in breast milk.

## How can families reduce the risks of exposure to arsenic?

- If you use arsenic-treated wood in home projects, you should wear dust masks, gloves, and protective clothing to decrease exposure to sawdust.
- If you live in an area with high levels of arsenic in water or soil, you should use cleaner sources of water and limit contact with soil.

- If you work in a job that may expose you to arsenic, be aware that you may carry arsenic home on your clothing, skin, hair, or tools. Be sure to shower and change clothes before going home.

## Is there a medical test to determine whether I've been exposed to arsenic?

There are tests available to measure arsenic in your blood, urine, hair, and fingernails. The urine test is the most reliable test for arsenic exposure within the last few days. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. These tests can determine if you have been exposed to above-average levels of arsenic. They cannot predict whether the arsenic levels in your body will affect your health.

## Has the federal government made recommendations to protect human health?

The EPA has set limits on the amount of arsenic that industrial sources can release to the environment and has restricted or cancelled many of the uses of arsenic in pesticides. EPA has set a limit of 0.01 parts per million (ppm) for arsenic in drinking water.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit (PEL) of 10 micrograms of arsenic per cubic meter of workplace air ( $10 \mu\text{g}/\text{m}^3$ ) for 8 hour shifts and 40 hour work weeks.

## References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Arsenic (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

## Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

## Attachment G

Safety Data Sheet for Super Triple Phosphate  
(American Plant Food Corp. Product: Multi-Pel 0-46-0)

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**American Plant Food Corp**  
903 MAYO SHELL ROAD/PO Box 584  
GALENA PARK, TEXAS 77547  
PHONE NUMBER 800-634-2861

**Safety Data Sheet**  
**Multi-Pel 0-46-0**

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Multi-Pel 0-46-0  
**Chemical Name:**  $\text{Ca}(\text{H}_2\text{PO}_4) \cdot \text{H}_2\text{O}$   
**Guaranteed Analysis%** 0%N, 46%P<sub>2</sub>O<sub>5</sub>, 0%K<sub>2</sub>O  
**CAS Registry Number:** 65996-95-4  
**Product Use:** Dry Fertilizer For Soil Application to Improve Plant Growth  
**Supplier:** American Plant Food Corp. 903 Mayo Shell Rd, Galena Park, TX 77802  
**Telephone:** 800-634-2861  
**Emergency Phone #s:** **FOR CHEMICAL EMERGENCY**  
(Spill, Leak, Fire, Exposure or Accident) (800) 424-9300 CHEMTREC  
**FOR MEDICAL/HANDLING EMERGENCIES**  
INFOTRAC USA: (800) 424-9300 CHEMTREC

## 2. SIGNAL WORD: WARNING



**Irritant**

**EMERGENCY OVERVIEW** (800) 424-9300 CHEMTREC. Not flammable or explosive, but will decompose in extreme heat to produce toxic fumes of oxides of nitrogen ammonia, oxides of phosphorous, and oxides of potassium.

### **MAY CAUSE EYE, SKIN, AND RESPIRATORY IRRITATION.**

- Avoid contact with skin and clothing. Wash after handling.
- Wear appropriate personal protective equipment. (See Section 8 for additional information)

### **POTENTIAL HEALTH EFFECTS (See Section 11 for additional information)**

Primary Route (s) of Exposure: Dermal Contact, Eye Contact, Inhalation, Ingestion

Acute Exposure:

- Inhalation May cause respiratory irritation
- Eye Contact Irritating to eyes
- Skin Contact Irritating to skin.

Carcinogenicity:

Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.

Chronic Effect/Developmental

Repeated skin exposure can produce local skin destruction or dermatitis. Repeated exposure to the eyes to a low level of dust can produce eye irritation.



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Medical Conditions Aggravated: Skin conditions, Eye conditions, Gastrointestinal condition

**POTENTIAL ENVIRONMENTAL EFFECTS** (See Section 12 for additional information)

This material is a water pollutant. Do Not let spilled or leaking material enter waterways.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients (See Section 8 for Exposure Limits)	% (w/w)	CAS Number
Calcium Phosphate	<88%	7758-23-8
Dicalcium Phosphate	<16%	7757-93-9

### 4. FIRST AID MEASURES

- Inhalation:** If inhaled, remove to fresh air. If not breathing give artificial respiration. Get medical attention.
- Eye Contact:** Check for and remove any contact lenses. Rinse immediately with plenty of water. Get medical attention.
- Skin Contact:** Wash with soap and water. Get medical attention.
- Ingestion:** Do Not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention.

### 5. FIRE FIGHTING MEASURES

- Extinguishing Media:** Use water fog or spray, dry chemical, foam or carbon dioxide extinguishing agents.  
Do not use heavy water stream.
- Fire Fighting Procedures:** Wear self-contained breathing apparatus, approved by NIOSH. Do not wash material into any streams, waterways, drainage ditches, or storm sewers, etc. Impound liquids used in firefighting to prevent entry into streams, ditches, sewers, etc.

	Health:	Fire:	Reactivity:	Other:
NFPA Hazard Rating	1	0	0	None
[ 0 – Minimal      1 – Slight      2 – Moderate      3 – High      4 – Extreme ]				

### 6. ACCIDENTAL RELEASE MEASURES

- Spill/Leak:** Safely stop source of spill. Restrict non-essential personnel from area. All personnel involved in spill clean up should avoid skin and eye contact by wearing appropriate personal protective equipment.
- Cleanup:** Sweep up spilled solid material, being careful not to create dust. Return sweepings to stock or, if contaminated, place into a chemical waste container for disposal according to local, state, and/or federal regulations.



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## 7. HANDLING AND STORAGE

Store in cool, dry, well-ventilated area away from incompatible substances. Protect from physical damage. Avoid generating dust and the release of dust into the workplace. Refrain from eating, drinking, or smoking in work areas.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Applicable Exposure Limits:

Chemical Name	OSHA – PELS (mg / m <sup>3</sup> )		ACGIH – TLVs (mg / m <sup>3</sup> )		NIOSH – RELS (mg / m <sup>3</sup> )	
	TWA	STEL/CEIL (C)	TWA	STEL/CEIL (C)	TWA	STEL/CEIL (C)
Triple Superphosphate	15 Total 5 Respirable	N/D	1	3	N/D	N/D

### Legend:

CEIL:	Ceiling Exposure Limit	PEL:	Permissible Exposure Limit
STEL:	Short Term Exposure Limit	REL:	Recommended Exposure Limit
N/D:	Not Determined	TLV:	Threshold Limit Value
ACGIH:	American Conference of Governmental Industrial Hygienists	TWA:	Time-Weighted Average
NIOSH:	National Institute for Occupational Safety and Health	WEEL:	Workplace Environmental Exposure Level
OSHA:	Occupational Safety and Health Administration		

### Personal Protective Equipment (PPE)

- **Protective Clothing:** The hazard potential of this material is low. Where there is large-scale use of this material and significant potential for worker contact, gloves and long sleeved work clothes or disposable coveralls may be necessary. Eye protection should be worn where dust is generated and there is a potential that eye contact may occur.
- **Ventilation:** Use adequate local or general ventilation where necessary to maintain the concentrations of dust well below the recommended occupational exposure limits for general particulates. Not Otherwise Specified (NOS).
- **Respirators:** Where dust is generated and cannot be controlled to within acceptable levels by engineering means, use appropriate NIOSH-approved respiratory protection equipment a 42CFR84 Class N, R or P-95 particulate filter cartridge.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State/Appearance	Solid greyish/white pellets
Boiling Point:	N/A
Bulk Density:	57-65 lbs./cubic foot
Cloud Point:	N/A
Evaporation Rate (Butyl Acetate=1):	N/A
Melting Point:	N/A
Odor Threshold:	N/A
pH:	2-3
Partition Coefficient (n-octanol/water):	N/A
Pour Point:	N/A
Solubility in water:	Soluble
Solubility in other solvents:	N/A
Specific Gravity (H <sub>2</sub> O = 1) :	N/A



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Vapor Density ( Air = 1):	N/A	
Viscosity:	N/A	
Volatiles (% by weight) :	N/A	
Other-Decomposition temperature	N/A	
Conditions of Flammability:	Non Flammable	
Flash Point (Method):	N/A	
Upper Flammable Limit (% by volume)	N/A	
Lower Flammable Limit (% by volume):	N/A	
Auto-Ignition Temperature	N/A	
<: less than	>: greater than	= : approximately

## 10. STABILITY AND REACTIVITY

**Stability:** This product is stable at ambient temperatures and atmospheric pressures.

**Incompatibilities/Conditions to avoid:** Avoid contact with strong alkaline or acid compounds.

**Decomposition Products:** Ammonia. Oxides of Nitrogen, Phosphorous, and Potassium.

## 11. TOXICOLOGICAL INFORMATION

### TOXICITY DATA

Ingredient Name	TEST	RESULT	ROUTE	SPECIES
Triple Superphosphate	LD50	>2000 mg/kg	Dermal	RABBIT
	LD50	17500 mg/kg	Oral	RAT

**GENERAL:** The form in which this material is sold is considered to be relatively non-toxic.

**SKIN/EYE:** Direct contact may cause local irritation, but is not expected to cause significant tissue damage.

**INHALATION:** Acute inhalation may result in irritation, but is not expected to cause significant harmful effects. Symptoms may include discomfort, coughing, sneezing, and shortness of breath.

**INGESTION:** Ingestion of large doses can irritate the stomach, resulting in abdominal pain, nausea, diarrhea, and vomiting.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity:** No data available on the mixture. Components within the mixture can be damaging to aquatic organisms.

**Environmental Fate:** Product is not expected to bio accumulate. Release of components in this mixture to the aquatic environment can cause algae growth which may increase turbidity and displace oxygen resulting in a hazard to fish or other marine organisms. Will disperse with the current. Release to watercourses may cause effects down stream from the point of release. Avoid spills or release to watercourse.



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**13. DISPOSAL CONSIDERATIONS**

**Waste & Container Disposal:** Do not wash down drain. Put uncontaminated material back into process if at all possible. Place contaminated material in suitable, labeled containers for disposal. Dispose of waste material consistent with the requirements of waste disposal authorities.

**14. TRANSPORT INFORMATION**

<b>Shipping Information:</b>	Not regulated for transport
<b>Required Labels:</b>	N/A
<b>Environmentally Hazardous Substances [49 CFR 172.101, Appendix A]:</b>	N/A

**15. REGULATORY INFORMATION**

<b>Regulatory Lists:</b>		
Ingredients listed on TSCA inventory	Yes	
Hazardous work hazard communication standard	No	
CERCLA Section 103 Hazardous Substances	No	
EPCRA Section 302 Extremely Hazardous Substance	No	
EPCRA Section 311/312 Hazard Categories	No	
EPCRA Section 313 Toxic Release Inventory	No	

**16. OTHER INFORMATION**

<b>Prepared by:</b> <b>Technical Staff</b>	<b>American Plant Food Corp. 903 Mayo Shell Rd, Galena Park, TX 77802</b> <b>Telephone: 800-634-2861</b>
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**Safety Data Sheet**  
**Multi-Pel 0-46-0**

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<b>Date of First Issue:</b>	7/21/2020	<b>Version:</b>	3
<b>Revision Date:</b>	11/16/2020		

## Attachment H

### Project-Specific Job Safety Analysis Table

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**JSA – JOB SAFETY ANALYSIS**

Description of Job/Task	Potential Hazards	Risk control measures
List the tasks required to perform the activity in the sequence they are carried out.	Against each task list the hazards that could cause injury when the task is performed.	List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
<b>Motor Vehicle Operation</b>	Hazardous weather conditions	Use defensive driving techniques Be aware of weather and plan accordingly to allow sufficient time Vehicle inspection/maintenance (tires, brakes, wipers, etc.)
	Poor lighting conditions	Vehicle inspection/maintenance (vehicle lights) Use defensive driving techniques
	Accident/injury	Vehicle inspection/maintenance (lights) Use defensive driving techniques Use seat belts No cell phone use Minimize other distractions (eating, etc.) Obey speed limits
	Parking / Backing	All onsite vehicles are to be parked such that first movement is forward.
	Driver fatigue	Take frequent rest breaks, especially when driving at night or in poor weather conditions.
<b>Traffic Control</b>	On-site Traffic (vehicle/pedestrian)	Proper PPE (reflective vests) Use signage and/or traffic control equipment to restrict vehicle traffic as appropriate Set clear traffic patterns and inform all drivers and workers Ensure backup alarms work on all vehicles Communicate on all potential SIMOPs activities being conducted at site. Make sure control devices don't force pedestrians into vehicle traffic (or vice versa)
<b>Drill Rig Set-up/ Breakdown</b>	Overhead obstructions/power lines	Double-check area for obstructions before-hand. Have lookout watch as driver moves vehicle or raises mast. Do not move drill rig with mast raised. Keep mast a minimum of 20 ft from overhead power lines. Check with utility company if in doubt.
	Uneven ground surface	Level drill rig using hydraulic jacks and jack pads, if needed.
	Electrical storms (applies to all site activities).	Shut down and move away from heavy equipment, especially drilling masts during electrical storms. Lower drilling mast if time allows before approaching storm.
<b>Drilling Operations</b>	Malfunctioning safety equipment (applies to all work with drill rig).	Test all safety (kill) switches before starting work. Make sure all personnel on-site are familiar with location and operation of safety switches.

Description of Job/Task	Potential Hazards	Risk control measures
<b>Drilling and Soil Sampling Cont'd</b>	Worn cables (applies to all work with drill rig).	Inspect cables for stress and fraying before and during use.
	Bodily injury (cuts, abrasions, sprains, strains) to hands, back, feet, eyes, etc. from handling tools and equipment.	Wear proper PPE (including task appropriate gloves, safety glasses, steel toed boots). Use proper lifting techniques (lift with legs, not back). Use mechanical means or work with partner when moving heavy objects. Practice good housekeeping to minimize slip and trip hazards. Inspect tools prior to and during use. Do not work under any load.
	Hydraulic line and grout pump hose leaks (applies to all work with drill rig).	Inspect hydraulic lines and grout pump hose before and during use.
	Pinch points (applies to all work with tools and equipment).	Keep hands clear of moving parts and out of line of fire. Wear task appropriate gloves.
	Loose clothing, jewelry (applies to all work with drill rig).	Remove or secure loose clothing and jewelry.
	Injury from objects falling from drill rig (applies to all work with drill rig).	Do not work under any suspended load. Non-essential personnel stand back from drill rig. Wear hard hat.
	Heat generation	Use water to cool drilling tools, if needed.
	Flying debris	Wear safety glasses.
	Noise (applies to all work with drill rig).	Wear appropriate hearing protection during operation.
	Dust	Maintain safe distance or stand up-wind if feasible. Wear a dust mask or respirator as needed. Use water spray to suppress dust, if needed.
	Underground utilities	Perform pre-drilling utility markouts. Use air knife as needed to clear boreholes near suspected or known utilities. Observe drilling operations for unexpected conditions (e.g., backfill). Stop work and contact PC, if unexpected conditions are encountered.
	Congested work area (applies to all work with drill rig).	Plan work area and practice good housekeeping.
	Step/Slip (applies to all work with drill rig).	Use care when stepping on and off drilling platform. Keep platform clean.
	Potential of inhalation or dermal exposure to hazardous substances (applies to all intrusive work activities).	Wear appropriate chemical PPE (gloves, coveralls, and respirator, if appropriate based on conditions).
Potential injury from worn or broken tools	Inspect tools before use. Use the right tool for the job. Don't use cheater bars on pipe wrenches.	
<b>Hand Digging (hand auger, post hole digger, etc.)</b>	Bodily injury (cuts, abrasions, sprains, strains) to hands, back, feet, eyes, etc. while handling tools and equipment.	Wear proper PPE (including task appropriate gloves, safety glasses, steel toed boots). Practice good housekeeping to minimize slip and trip hazards. Inspect tools prior to and during use.
	Fatigue	Take rest breaks.

Description of Job/Task	Potential Hazards	Risk control measures
<b>Hand Digging (hand auger, post hole digger, etc.), Cont'd</b>	Underground utilities	Perform pre-drilling utility markouts. Frequently inspect borehole for unexpected conditions (e.g., backfill). Stop work and contact PC, if unexpected conditions are encountered.
<b>Well Installation and Surface Completion</b>	Bodily injury (cuts, abrasions, sprains, strains) to hands, back, feet, eyes, etc. from handling tools and equipment.	Wear proper PPE (including task appropriate gloves, safety glasses, steel toed boots). Use proper lifting techniques (lift with legs, not back). Use mechanical means or work with partner when moving heavy objects (e.g., augers, soil drums, bags of sand). Practice good housekeeping to minimize slip and trip hazards. Inspect tools prior to and during use.
	Potential for cuts when cleaning soil off augers.	Wear appropriate protective gloves. Use tool to clear soil from augers, when possible.
	Exposure to dust from sand, powdered cement, and powdered bentonite.	Avoid breathing dust; wear dust mask/respirator, when necessary.
	Potential for hand injury when cutting PVC well risers	Wear appropriate gloves. Use correct tool for job (e.g., PVC saw).
	Potential for splash hazard when pumping grout	Inspect hoses for leaks/breaks before and during use. Wear proper eye protection and avoid pressurized hoses when possible.
<b>Well Installation and Surface Completion</b>	Slip/fall hazard from wet bentonite or grout.	Clean up excess bentonite or grout around borehole.
	Potential for cuts when handling steel casing or wire wrap casing.	Wear appropriate protective gloves
<b>Site Security</b>	Vicious dogs (applies to all work on site).	Avoid contact with any roaming animal. Contact animal control, if available.
	Criminal Activity (applies to all work on site).	Do not leave tools and equipment unattended. Lock vehicles when unattended. Be alert to presence of unauthorized persons on site. Avoid confrontations and alert police of menacing behavior. Work in groups, if needed.
	Poor visibility (applies to all work on site).	Work only under adequate lighting conditions. Use adequate portable lights and power supplies for night work.
<b>Working near Heavy Equipment</b>	Temporary/Poor Roads	Be cautious and drive slowly near steep slopes and hidden curves
		Be especially cautious in poor weather conditions
	Struck-by or Caught-between Incidents	Maintain eye contact with operator / laborer
		Wear safety vest or hi-viz yellow-green shirt. Reflective safety vests are required in low-light conditions
		Avoid working near backing vehicles. All onsite vehicles must have working backing alarms.
		Maintain safe distance from operating equipment (i.e., outside the swing radius of excavators)
Spotters must maintain contact with drivers and equipment operators		

Description of Job/Task	Potential Hazards	Risk control measures
	High noise levels	Avoid working near high-noise operations, where possible. Wear hearing protection near high-noise operations.
<b>Excavation/Soil Loading</b>	Dust	Water spray as needed for dust control Wear respirator with particulate cartridges if dust cannot be controlled.
	Cave ins	Ensure proper benching/sloping/shoring/shielding
	Underground Utilities	Ensure 1-call procedure is followed and private utility locate is performed before excavating
	Fall Incidents	Ensure all personnel stay back from edge of excavation, slope shallow excavations to avoid trip/fall hazard
<b>Additional Tasks</b>		
<b>Truck/Equipment Decontamination</b>	Splash Hazard	Wear polytyvek coveralls and boot covers, gloves and face shield with safety glasses/goggles.
	Injection Hazard	Keep pressure washer nozzle pointed away from body and others. Only one person in decon area during operation of pressure washer. All other workers must remain outside of spray/mist area.
<b>Oversight, Confirmatory Sampling, Surveying, Air Monitoring, Misc. On-Ground Tasks</b>	Heavy Equipment / On-site Traffic	Stay out of on-site traffic pattern. Wear hi-viz reflective safety vest.
	Uneven Surfaces - Trip/Fall Hazards	Keep eyes on walking path
	Dermal Contact with/Ingestion of Contaminated Soil	Wear boot covers when walking in contaminated soil areas Maintain safe work procedures to avoid direct contact with soil Do not drink, eat or smoke in work areas.
	Dust Inhalation	Stay upwind of active work areas when possible Wear respirator with particulate filter where needed

## Attachment I

Health & Safety Plan Acknowledgement Form and  
Daily Tailgate Safety Meeting Form

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**HASP / EMERGENCY ACTION PLAN  
ACKNOWLEDGEMENT**

- I have reviewed this HASP / Emergency Action Plan and have received a briefing of job tasks and understand the potential physical and chemical hazards that may be present on this project.
- My training required to perform this work is complete and current (for example: OSHA HAZWOPER refresher, equipment operator training, client-required training, etc.)
- I understand that I have the responsibility to recognize and to stop unsafe work or to stop work if unsafe conditions develop and to report all close calls, potential injuries, and incidents to the Site Safety Officer immediately.

**Required training for this project:**

Print Name	Signature	Date	Company Affiliation	Required Training Verified		Short Service Employee		If Yes, identify Mentor
				YES	NO	YES	NO	
_____	_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
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**\*Short Service Employees: Workers with less than six months of experience in their current position.**



**DAILY TAILGATE SAFETY MEETING,  
JOB SAFETY ANALYSIS,  
AND PPE HAZARD ASSESSMENT**

<b>Date:</b>		<b>Project #:</b>	
<b>Location:</b>			
<b>Task Summary:</b>		<b>Site Safety Officer Name / Signature:</b>	
<b>BASIC REQUIRED PPE: hard hat, safety boots, safety glasses, appropriate work gloves, hi-viz shirt/vest</b>			
<b>Identify Potential Hazard Types:</b>		<b>Identify Specific Hazard(s):</b>	<b>Hazard Mitigation Method(s):</b> Eliminate/ Substitute, Engineering & Administrative Controls and Work Methods, PPE
<input type="checkbox"/>	Slip / Trip / Fall Hazards		
<input type="checkbox"/>	Heat/Cold Exposure or Severe Weather Hazards		
<input type="checkbox"/>	Abrasion / Cut Hazards		
<input type="checkbox"/>	Pinch Point/ Rotating Equip/ Caught Between Hazards		
<input type="checkbox"/>	Vehicle Traffic/Heavy Equipment / Struck-by Hazards		
<input type="checkbox"/>	Eye Hazards -Flying Particles/Dust/Splash		
<input type="checkbox"/>	Noise Exposure		
<input type="checkbox"/>	Back Safety/Manual Lifting / Overexertion Hazards		
<input type="checkbox"/>	Chemical Exposure/Respiratory Hazard (review SDS)		
<input type="checkbox"/>	Flammable Gas or Liquid/Flash Fire Hazard		
<input type="checkbox"/>	Conflicting Work/SIMOPS Hazards		
<input type="checkbox"/>	Electrical Hazards (use of GFCI, trip circuit breakers, etc.)		
<input type="checkbox"/>	Biological Hazards (insects, plants, animals, BBP, waste)		
<input type="checkbox"/>	Overhead/Underground Utility/Structure Hazards		
<input type="checkbox"/>	Excavation / Trench Hazards		
<input type="checkbox"/>	Hot Work Hazard/Ignition Source Present		
<input type="checkbox"/>	Confined Space Hazards (is a permit required?)		
<input type="checkbox"/>	Radiation Hazards (UV and ionizing radiation)		
<input type="checkbox"/>	Personal Security Hazards		
<input type="checkbox"/>	Critical Lift / Working at Heights (>4 ft)		
<input type="checkbox"/>	Additional details to do this job safely, including:		
<b>Stretch/warmup</b> (list out stretches/warmup performed that are appropriate to the task(s) listed above):			
<b>Worker Signatures:</b> I have read and understand the hazards noted above and understand the actions needed to eliminate or reduce the hazards and have warmed up or stretched to minimize the chance of injury. I am fit for duty.			
<b>PRINT NAME / SIGNATURE PRINT NAME / SIGNATURE</b>			
1.		6.	
2.		7.	
3.		8.	
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